

DPU

DR. D. Y. PATIL VIDYAPEETH (DPU), PIMPRI, PUNE
(Deemed to be University)

(Accredited (3rd Cycle) by NAAC with a CGPA of 3.64 on four point scale at 'A++' Grade)

(Declared as Category - I University by UGC Under Graded Autonomy Regulations, 2018)

ENVIRONMENTAL IMPACT



Environmental Education

**REPORT ON UNIVERSITY COURSES
THAT TEACH ENVIRONMENTAL
SUSTAINABILITY**

A REPORT ON COURSES THAT SPECIFICALLY ENVIRONMENTAL SUSTAINABILITY

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WRITE UP ON COURSES THAT SPECIFICALLY ENVIRONMENTAL SUSTAINABILITY

Dr. D. Y. Patil Vidyapeeth, Pune, is committed to integrating environment and sustainability education across its courses and curriculum, fostering ecological consciousness and sustainable practices among students. The institution offers diverse programs that equip students with essential knowledge of environmental science, pollution control, and sustainability strategies.

The **Environmental Science** course introduces students to natural resources, ecosystem functions, pollution management, biodiversity conservation, and environmental laws. Through **fieldwork and case studies**, students engage with local environmental challenges, promoting hands-on learning and problem-solving skills. For biotechnology and environmental sciences students, **Environmental Biotechnology** explores pollution mitigation, bioremediation, waste management, and biofuels for sustainable energy solutions. The curriculum emphasizes advanced biotechnological approaches to environmental conservation.

Additionally, MBA programs incorporate **environmental management and sustainability-focused courses**, addressing corporate responsibility, green business models, and sustainable economic strategies. Specialized courses such as **Emerging Trends in Organic Farming** equip students with knowledge of organic agriculture, sustainable food systems, and market dynamics.

Through **interdisciplinary teaching, research projects, and industrial collaborations** in **environmental sciences, sustainability among various programs such as Medicine, Dentistry, Ayurved, Homeopathy, Nursing, and Physiotherapy**, DPU future nurtures leaders equipped to address environmental challenges, ensuring that sustainability becomes an integral part of their professional and personal decision-making.

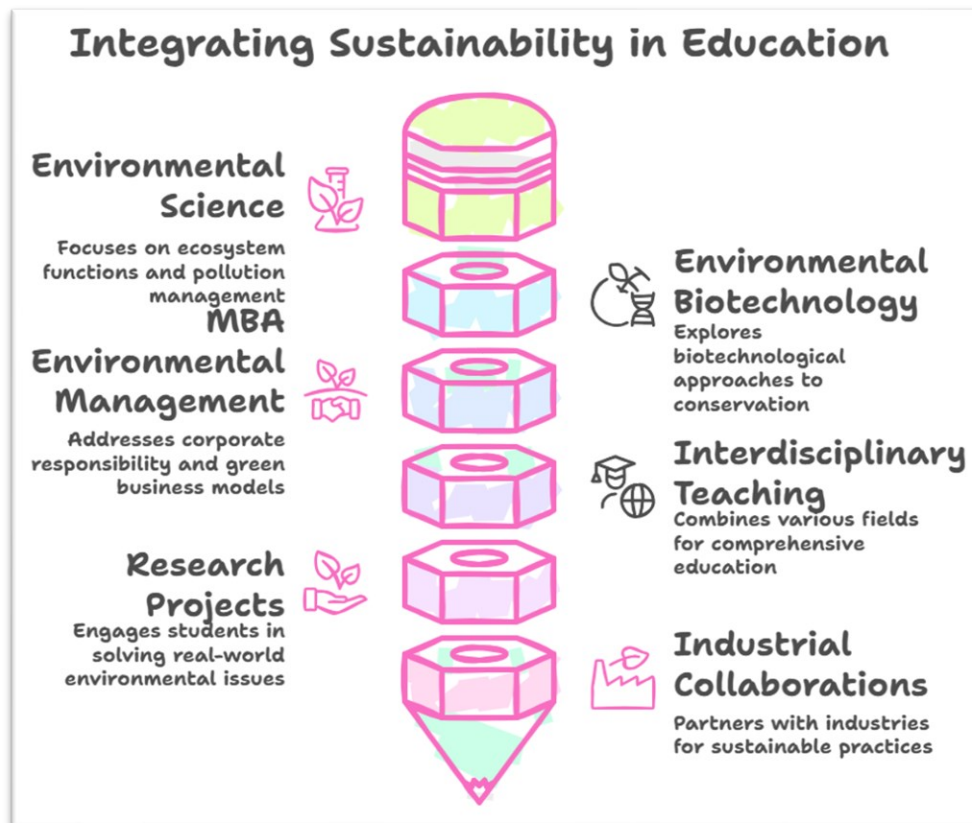


Figure 1: A summarized model on courses and curriculum on Environmental and Sustainability Education and awareness among students.

DPU

Programme
Outcome
Environment

Dr. D. Y. PATIL VIDYAPEETH, PUNE
(Deemed to be University)

DR. D. Y. PATIL VIDYAPEETH

Course On
Environmental
Science

PIMPRI, PUNE – 411 018

Course On
Environmental
Biotechnology

DR. D. Y. PATIL BIOTECHNOLOGY & BIOINFORMATICS INSTITUTE

TATHAWADE, PUNE

Environment and Sustainability Education
for Health programs

MBA and
Environment
Courses

SYLLABUS

B. TECH. BIOTECHNOLOGY

2023-2024

B. Tech Biotechnology Programme
Program Outcomes (PO)

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSO)

PSO-1	Integrate the knowledge of biology, engineering, and technology for applications in industry, consultancy, and research.
PSO-2	Explore solutions to complex biological problems using the acquired in-depth practical knowledge and domain-specific skill set.
PSO-3	Innovate and design strategies to conduct research with ethical and professional responsibilities.

DR. D.Y. PATIL VIDYAPEETH, PUNE
 DR. D. Y. PATIL BIOTECHNOLOGY & BIOINFORMATICS INSTITUTE,
 TATHAWADE, PUNE
 COURSE STRUCTURE FOR B. TECH. BIOTECHNOLOGY

SEMESTER I						
Course Code	Course Name	L	T	P	Hr	Cr
BS101	Physics	3	0	2	5	4
BS102	Chemistry	3	0	2	5	4
BT101	Electronics & Instrumentation Engineering	2	0	2	4	3
BI101	Python for Biologists	2	0	4	6	4
HU101	Communication Skills	1	1	0	2	2
BS103	Maths I – Mathematics	2	0	0	2	2
BTAEC101	Aptitude Building-I	0	0	2	2	1
Total		13	1	12	26	20
SEMESTER II						
Course Code	Course Name	L	T	P	Hr	Cr
BT201	Biochemistry	3	0	4	7	5
BT202	Cell Biology	3	0	2	5	4
BS201	Maths II -Statistics	2	0	2	4	3
BT203	Engineering Mechanics	2	0	2	4	3
BS202	Environmental Sciences	2	0	2	4	3
BT204	Engineering Graphics	1	0	2	3	2
HU201	Disaster Management*	0	1	0	1	0
BTIKS201	History of Indian Science	1	0	0	1	1
BTAEC201	Aptitude Building-II	0	0	2	2	1
Total		14	1	16	31	22
<i>*Audit course, attendance is must</i>						
SEMESTER III						
Course Code	Course Name	L	T	P	Hr	Cr
BT301	Analytical Techniques	2	0	4	6	4
BT302	Microbiology & Virology	2	0	4	6	4
BT303	Genetics	3	0	2	5	4
BI301	Concepts in Bioinformatics	2	0	4	6	4
BT304	Biosafety, Bioethics & IPR	2	0	0	2	2
HU301	Universal Human Values II	2	1	0	3	3

BTSEC301	NPTEL/SWAYAM/MOOC online course	2	0	0	2	2
BTAEC301	Aptitude Building-III	0	0	2	2	1
Total		15	1	16	32	24
SEMESTER IV						
Course Code	Course Name	L	T	P	Hr	Cr
BT401	Molecular Biology	3	0	4	7	5
BT402	Stem cells & Animal Tissue culture	2	0	2	4	3
BT403	Plant Biotechnology	3	0	4	7	5
BT404	Immunology	3	0	2	5	4
BT405	Developmental Biology	2	0	2	4	3
BTIKS401	Indian Regional Biodiversity	0	1	0	1	1
BTAEC401	Aptitude Building-IV	0	0	2	2	1
BTOP401 Non-credit mandatory course	Social outreach program/ Science for Society	0	1	0	1	0
Total		13	2	16	31	22
SEMESTER V						
Course Code	Course Name	L	T	P	Hr	Cr
BT501	Environmental Biotechnology	2	0	2	4	3
BT502	Recombinant DNA Technology	2	0	4	6	4
BT503	Biochemical Engineering & Bioprocess Technology	3	0	4	7	5
BT504	Enzymology & Enzyme Technology	2	0	2	4	3
BI501	R Programming	1	0	0	1	1
BT 505/BT506/ BT507	Elective-I BT505 Biopharmaceuticals BT506 Clinical Research BT507 Human Diseases and Pathobiology	3	0	2	5	4
BTSEC501	Science communication	0	0	2	2	1
BTAEC501	Aptitude Building-V	0	0	2	2	1
Total		13	0	18	31	22
SEMESTER VI						
Course Code	Course Name	L	T	P	Hr	Cr
BT601	Food Biotechnology	2	0	2	4	3
BT602	Marine Biotechnology	2	0	0	2	2
BT603	Basic Pharmacology & Toxicology	2	0	0	2	2
BT604	Genomics, Transcriptomics and Proteomics	3	0	4	7	5
BI601	Artificial Intelligence	1	0	2	3	2
BT605/BT606	Elective II: BT605 Perl & Bioperl BT606 Structural Biology	3	0	2	5	4
BTIKS601	Indian Constitution and Law	1	0	0	1	1

BTSEC601	Foreign Language Course German/French/Japanese/Korean/Spanish/ any other (online MOOCs/offline)	2	0	0	2	2
BTAEC601	Aptitude Building-VI	0	0	2	2	1
Total		16	0	12	28	22
SEMESTER VII						
Course Code	Course Name	L	T	P	Hr	Cr
BI701	Molecular Modeling	2	0	4	6	4
BT701	Nanobiotechnology and Biosensors	2	0	2	4	3
HU701	Principles of Management & Entrepreneurial Development	2	0	0	2	2
HU702	Quality Control Management in Biotechnology	2	0	0	2	2
BT702	Seminars in Biotechnology	2	0	0	2	2
BT 703/BT704/ BT705	Elective-III BT703 Metabolic Engineering BT704 Agriculture Biotechnology BT705 Cancer Biology	3	0	2	5	4
BTAEC701	Aptitude Building-VII	0	0	2	2	1
Total		13	0	10	23	18
Semester VIII						
BTMP801	Research Project/Industrial Training/ Review writing/Entrepreneurship Start- up (5 months)	22 Credits				
TOTAL CREDITS		172				

SEMESTER I						
Course Code	Course Name	L	T	P	H	C
BS101	Physics	3	0	2	5	4
BS102	Chemistry	3	0	2	5	4
BT101	Electronics & Instrumentation Engineering	2	0	2	4	3
BI101	Python for Biologists	2	0	4	6	4
HU101	Communication Skills	1	1	0	2	2
BS103	Maths I – Mathematics	2	0	0	2	2
BTAEC101	Aptitude Building-I	0	0	2	2	1
Total		13	1	12	26	20

COURSE: PHYSICS**COURSE CODE: BS101****MARKS: (Theory 100 + Practical 50)****L T P H C****3 0 2 5 4****OBJECTIVE**

The objective of this course is:

- To create general understanding regarding basic physical principles involved in living systems.
- To familiarize the student with basic concepts in physics as: classical optics used in microscopes and telescopes, thermometry and heat, mechanical, fluid and solid state properties.
- To familiarize students with concepts in digital electronics, lasers, sound waves, electricity.
- To introduce them to concepts in modern physics such as: production of X-ray, X-ray crystallography, quantum mechanics etc.

COURSE OUTCOME

CO No.	At the end of the course, the learner should be able to:
BS101.1	Restate the fundamentals of optics and its usage in various biological instrumentation and analysis
BS101.2	Comprehend the principles and applications of thermometry
BS101.3	Apply the concepts of surface tension, viscosity, semiconductor devices in real life
BS101.4	Categorize materials on the basis of elastic and solid state properties
BS101.5	Determine and explain the properties of laser and sound
BS101.6	Demonstrate the applications of modern physics in biological sciences

PREREQUISITES

This is an introductory course. School level knowledge of physics is sufficient. There are no prerequisites.

COURSE DESCRIPTION

Unit	Topics	Detail syllabus	No. of Lectures
1	Optics: Interference Diffraction & Polarization	Introduction to optics, Principles of superposition, Constructive & Destructive Interference, Types of Interference, Newton's rings. Diffraction- Types of diffraction, Diffraction grating, Rayleigh's criterion, Resolving power of Microscope and Telescope. Polarization of light waves, Polaroid, Optical activity.	8
2	Thermometry and Heat	Principles of Thermometry, Temperature and its measurements, Platinum resistance Thermometer, Thermocouple and Thermistors, Modes of Heat Transfer.	5

3	Properties of Fluid: Surface Tension & Viscosity	Surface Tension, Surface Energy, Angle of Contact, Capillarity action, Determination of Surface tension by capillary rise method, Jaeger's method, Temperature dependence of surface tension and its applications. Viscosity, Coefficient of viscosity, streamline and turbulent flow, Reynold's number, Stoke's law, Terminal velocity, Determination of ' η ' by falling sphere method.	7
4	Elasticity	Stress and Strain, Hook's law, Stress-strain curve, Young's modulus, Determination of Young's modulus.	3
	Solids and Semiconductor Devices	Classification of Solids (Conductor, Semiconductor and Insulators), intrinsic and extrinsic semiconductors, PN Junction Diode, Zener Diode, Junction Transistors (CE, CB mode)	5
5	Introduction to Digital Electronics	Introduction to Binary mathematics, BCD numbers, Basic logic gates, De-Morgan's Theorem	2
	Lasers	Properties of Lasers, Production mechanism, Ruby Laser, Helium Neon Laser, applications of Lasers.	3
	Sound waves	Types of sound waves (Longitudinal and Transverse), Audible, Ultrasonic and Infrasonic waves, Beats, Doppler effect, Applications of Ultrasonic waves.	3
	Electricity	Heating effect of electric current, Joule's law, Transformers, Types of Transformers.	2
6	Modern Physics: X-rays, Crystallography, Introduction to Quantum Mechanics	Introduction to X-Rays: Introduction, Production of X-rays, X-Ray diffraction and its Applications. Introduction to crystal structure, Unit cell, seven crystal systems. Plank's Quantum Theory, Properties of Photon, Photoelectric effect, wave particle duality of radiation, de Broglie's hypothesis, Heisenberg's Uncertainty principle.	7
Total Number of Lectures			45

METHODOLOGY

The course will be covered through lectures supported by practicals.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	60 minutes	20
II Internal	45 minutes	15
Attendance		05
End Semester Exam	2 hours 30 minutes	60
Total		100

BOOKS RECOMMENDED:

1) David Halliday, Robert Resnick, J. Walker (2021). "Fundamentals of Physics" "John Wiley & Sons, Inc."

- 2) Arthur Beiser, Shobhit Mahajan and S Rai Choudhury (2015). "Concepts of modern physics", McGraw Hill
- 3) Singh Devraj, "Fundamentals of Optics" PHI Learning Pvt. Ltd. , 2nd edition, 2015
- 4) Ajoy Ghatak, "Optics", Mc Graw Hill Publication, 7th edition, 2020
- 5) Anil K. Maini, "Digital Electronics: Principles, Devices and Applications", JOHN WILEY , 2007
 1. Physics by D. Haliday and R. Resnik 5th edition, Wiley Eastern Pub, 2007.
 2. Perspectives of Modern Physics by A. Beiser, 6th edition, Mc Graw Hill, 2003.
 3. Fundamentals of optics by F. A. Jenkins and H. E. White, 4th edition, Mc Graw Hill, 1976.
 4. Optics by A. Ghatak, 3rd edition, Tata Mc Graw Hill, 2006.
 5. Digital Principles and Applications by A. P. Malvino, G. Saha and D. P. Leach, 7th edition, Mc Graw Hill, 2011.
 6. David Halliday, Robert Resnick, J. Walker (2021). "Fundamentals of Physics" "John Wiley & Sons, Inc."
 7. Arthur Beiser, Shobhit Mahajan and S Rai Choudhury (2015). "Concepts of modern physics", McGraw Hill

PRACTICAL IN PHYSICS**(2 H PER WEEK)****MARKS 50**

The practical training would be in the area of optics, electronics, thermometry, calorimeter, conductivity, measurement of physical properties as: viscosity and surface tension.

LIST OF EXPERIMENTS

1. Diffraction Grating: Use of diffraction grating for determination of wavelength of spectral lining.
2. Resolving Power: To determine the resolving power of Microscope or telescope.
3. Diode Characteristics: Study of forward and reverse characteristics of Diode.
Transistor Characteristics: Study of characteristics of Photocell.
4. Band gap of semiconductor: Study of input and output characteristics of a transistor and determination of band gap of a semiconductor.
5. Ultrasonic Interferometer: Determination of velocity of ultrasonic waves by ultrasonic
6. Study of logic gates (OR, AND, NOT).
7. Thermocouple: Study of variation of thermo emf (electromotive force) with temperature.
8. Surface Tension: Determination of the surface tension of a given solution.
11. Viscosity: Determination the coefficient of viscosity by Stoke's method and its practical application.
12. Joule's Law: Determine of Joule's constant.
13. Determination of wavelength of monochromatic light by Newton's rings experiments.
14. Thermal Conductivity: Determination of coefficient of thermal conductivity of given specimen.

PRACTICAL EVALUATION SCHEME

<i>Examination</i>	<i>Marks</i>
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

BOOKS RECOMMENDED:

1. Organic Chemistry by R. T. Morrison and R. N. Boyd, 7th Edition, Prentice Hall, 2011.
2. Organic Chemistry by I. L Finnar, 6th Edition Pearson Publications, 2002.
3. Physical Chemistry by A. Peter and P. Julio De 7th Edition, Oxford University Press, 2010.
4. Essentials of Physical Chemistry by B.S. Bahl & A. Tuli, S Chand & Co. 2000.
5. Biophysical Chemistry by A. Upadhyay, K. Upadhyay & N. Nath., Himalayan Publishing House. 2005.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BS 101.1	1	2	1	1	2	1	-	-	2	1	-	-	1	-	-
BS 101.2	1	1	1	1	1	1	-	-	1	1	-	0	1	-	-
BS 101.3	2	1	1	1	2	1	1	1	1	1	-	1	1	1	-
BS 101.4	2	2	1	1	1	1	-	-	-	1	-	1	1	1	-
BS 101.5	2	1	1	1	1	1	1	1	1	1	-	1	1	1	-
BS 101.6	2	1	1	1	1	1	2	2	1	1	-	1	1	1	1

COURSE: CHEMISTRY**COURSE CODE: BS102****MARKS: 150****L T P H C****3 0 2 5 4****OBJECTIVES:**

The objective of the course is:

- The objective of this course is to familiarize the student with the different concepts of physical and organic chemistry.
- The students will learn the structures of organic molecules as: alkanes, alkenes, alkynes, aliphatic and aromatic molecules and the stereochemistry behind the molecules with its importance in day today life
- They would learn the Basic concepts and principles with respect to physical chemistry, the bioenergetics of different reactions and the principles and applications of radioactivity.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BS102.1	Classify chemical structures of hydrocarbons
BS102.2	Determine the stereochemistry of organic molecules and assess their importance
BS102.3	Identify and compare electrophilic and nucleophilic reactions
BS102.4	Explain the concept of osmosis, viscosity, colloids, and prepare buffers for any biological system
BS102.5	Outline and apply the principles of thermodynamics in biological processes
BS102.6	Apply the knowledge of radioactivity and radioactive isotopes in biological and medical research and diagnosis

PREREQUISITES

This is the first introductory course and there are no prerequisites.

COURSE DESCRIPTION

Unit	Topics	Detail Syllabus	No. of Lectures
1	Introduction to organic chemistry	Functional groups, Chemistry of alkanes, alkenes, alkynes, aromatic, alicyclic and heterocyclic compounds	7
2	Stereochemistry	Stereo isomers, Enantiomers, Chiral centers/ Optical activity, Geometric isomers Meso- isomers, Conformational isomers, Stereochemistry of Cyclic Aliphatic compounds,	8

3	Reaction mechanisms	Nucleophilic (SN1, SN2 , Electrophilic E1 and E2)	3
4	Basic concepts and principles of Physical Chemistry	Osmosis- Diffusion, Osmotic Pressure, Theories of Osmosis. Viscosity –Introduction & Types of viscometer. Colloids-Lyophilic & Lyophobic sols, Optical properties, Electrical properties of sols, Gold number. Donnan Equilibrium. Phase rule-Phase, Components & Degree of freedom. Derivation of Phase rule. Phase diagram. Water system. Acid-bases- Three concepts of acids & bases, pH meter & types of electrodes, Buffer solution, Acid base indicator, Law of mass action, Numerical.	11
5	Bioenergetics	First & Second laws of Thermodynamics, Internal energy, Enthalpy, Entropy, concept of free energy, Standard free energy change of a chemical reaction, ATP & high energy phosphates compounds. Chemical equilibrium constant, Nernst equation	6
6	Basic principles of radioactive isotopes	Isotopes in Biology- Properties, Half-life, Radioactive decay. Measurement of radioactivity-Methods based on Gas ionization (Ionization chamber, Proportional counter, Geiger counter), Photographic methods, Methods based on Excitation (Liquid & solid Scintillation counting), Quenching. Use of Isotopes-Tritium, Iodine-131, Nitrogen-15, Oxygen-18, Carbon-14, Phosphorus-32, Sulphur-35.	9
Total Number of Lectures			45

METHODOLOGY

The course will be covered through lectures, demonstration and practicals.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	60 minutes	20
II Internal	45 minutes	15
Attendance		05
End Semester Exam	2 hours 30 minutes	60
Total		100

BOOKS RECOMMENDED:

1. Organic Chemistry by R. T. Morrison and R. N. Boyd, 7th Edition, Prentice Hall, 2011.
2. Organic Chemistry by I. L Finnar, 6th Edition Pearson Publications, 2002.
3. Physical Chemistry by A. Peter and P. Julio De 7th Edition, Oxford University Press, 2010.
4. Essentials of Physical Chemistry by B.S. Bahl & A. Tuli, S Chand & Co. 2000.
5. Biophysical Chemistry by A. Upadhyay, K. Upadhyay & N. Nath., Himalayan Publishing House. 2005.

PRACTICAL IN CHEMISTRY (2 Hs. Per Week) MARKS 50

Sr. No.	Name of the experiment	Learning objective
1	Acid-Base Titration	To understand the concept of titration and how to calculate the strength of acid and base.
3	Back Titration	To analyze the concentration of analyte based upon chemical reaction.
4	Determination of optical activity using a Polarimeter	Help them to analyze the degree of rotation of plane polarised light
5	Viscosity, Osmosis and Diffusion techniques	To analyze the physical properties of compound by measuring i) hypotonic, isotonic and hypertonic nature ii) thickness, sticky and semifluid consistency
6	Demonstrate the procedure for determining Melting/Boiling point	The practical will teach them how to analyze the transition point from solid to liquid and ii) liquid to vapor phase.
7	To determine the pH of a solution using a polarimeter	It will guide them to measure the pH of a solution in terms of H ⁺ ion concentration and to understand importance of pH in biological experiments.
8	Study of exothermic and endothermic reactions.	To understand the concept of thermodynamics of reaction based upon the absorption or release of heat energy.
9	Determine the heat of combustion of ethyl alcohol	To measure the amount of heat energy released during a chemical reaction.
10.	Determine the heat of neutralization of strong acid and strong base	To measure the change in enthalpy in a neutralization reaction to form water and a salt.

BOOKS RECOMMENDED:

1. Practical Organic Chemistry: Qualitative Analysis by S.P. Bhutani, A. Chhikara, ANE Books, 2009.
2. Laboratory Manuals In Biochemistry by J. Jayaraman, New Age International Private Ltd., 2000.
3. Experimental Physical Chemistry, By V. D. Athawale, P. Mathur, New Age International Private Ltd., 2000.
4. College Practical Chemistry, By V. K. Ahluwalia, S. Dhingra, Universities Press, 2005.

PRACTICAL EVALUATION SCHEME

Examination	Marks
Practical Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BS 102.1	3	1	1	1	0	1	0	0	1	1	0	0	3	2	1
BS 102.2	3	2	1	1	0	1	0	0		1	0	2	1	3	1
BS 102.3	3	2	1	1	0	1	1	0	1	1	0	2	3	1	1
BS 102.4	3	2	1	2	2	1	1	1	1	1	1	2	3	1	1
BS 102.5	3	2	1	1	1	1	1	1	1	1	1	2	3	1	1
BS 102.6	3	1	1	1	1	1	2	2	1	1	1	2	2	2	3

COURSE: ELECTRONICS AND INSTRUMENTATION ENGINEERING**COURSE CODE: BT101****L T P H C****MARKS: 100****2 0 2 4 3****OBJECTIVE:**

Objective of the course is to familiarize students with the basic concepts of electronic engineering and electronics engineering.

This knowledge would help them in applying them in various biological techniques. Also the Knowledge of this subject will form a profound base for the instrumentation used in various advanced courses of Biotechnology and Bioinformatics.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT 101.1	Outline the basic concepts of electronics and semi-conductor devices
BT 101.2	Demonstrate the different applications of linear integrated circuits
BT 101.3	Examine and classify various digital electronic components for circuit designing
BT 101.4	Illustrate the working of temperature and pressure transducers

PREREQUISITES:

Since the course is very basic in nature, school level knowledge of physics and mathematics is required.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1	Basics	History and scope of electronics, Electrical signals, passive electronic components, resistors, capacitors, inductors, Bio signals	2
	Semiconductor devices	Diode circuits, P-N junction diode, biasing, half wave and full wave rectification	2
2	Linear integrated circuits	Introduction to operational –amplifiers, characteristics of op-amp, virtual short and virtual ground, concept of feedback, inverting and non-inverting amplifier, applications of op-amp, addition, subtraction, integration, and differentiation	8
3	Digital electronics	Digital circuits, AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR, Boolean algebra, half adder, full adder, multiplexers and de-multiplexers, flip-flops, shift registers, counters, block diagram of microprocessor and microcontroller	8

4	Basic instrumentation	Sensors and transducers, basic measurement system, static and dynamic characteristics of an instrument, signal conditioning circuits	6
Total Number of lectures			30

METHODOLOGY:

The course will be covered through lectures, demonstration and practicals.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS RECOMMENDED:

1. R. P. Jain (2010), Modern Digital Electronics, Tata Mc Graw Hill, 4th Edition
2. M. E. Schultz (2024), Grob's Basic Electronics , Tata McGraw Hill, 24th Edition
3. V. K. Mehta (2020), Principles of electronics, S. Chand Publisher , 12th Revised Edition
4. Ramakant A. Gayakwad (2015) ,Op-Amps and Linear Integrated Circuits By McGraw –Hill publishing company limited, 4th Edition
5. Millman and Halkias (2009), Integrated Electronics By. Mcgraw-Hill, 4th Edition
6. Ramesh Gaonkar (2013),Microprocessor Architecture, Programming, and Applications with the 8085, Penram Publisher , 6th Edition
7. A. K. Sawhney, Puneet Sawhney (2012), A course in electrical and electronic measurements and instrumentation , Rai publisher

PRACTICALS ELECTRONICS AND INSTRUMENTATION ENGINEERING (2 Hs. PER WEEK)
MARKS 50

Sr no.	Name of the experiment	Learning objective	Literature/ Web links for reference and videos
1	Study of passive components in electronics Resistors, Inductors, capacitors, relay, switches, transformers and connectors.	Students should able to learn different passive components, their classification, symbol, and unit.	Principles of Electronics by V.K.Mehta and R. Mehta, S. Chand, 2005
2	Study of basic electronics measuring instruments DMM, CRO and function generator.	Students should able to operate CRO, function generator to generate different electrical signals. They should able to measure Voltage, current, frequency and time period of waveforms.	
3	Study of semiconductor devices, P-N junction Diode. Plot VI characteristics of P-N junction diode.	Students should able to learn different semiconductor devices like diode, transistors and also working of PN junction diode. They should able to plot VI characteristics graph.	
4	Study of operational amplifier Part I : Op-amp IC741 Part II: Op-amp as inverting and non-inverting amplifier.	Students should able to learn basic working principle of op-amp, pin diagram of IC 741.	
5	Study of digital logic circuits.	Students should able to learn different logic gates, their truth table and timing diagram.	
6	Study of pH electrode.	Students should able to understand operation of pH electrode for the measurement of pH.	
7	Study of resistance type temperature transducers.	Students should able to learn working principle of different resistance type temperature transducers like PRT, RTD, Thermistor, thermocouple	

8	Study of conductivity meter electrode.	Students should able to understand the operation of conductivity meter electrode to measure conductivity of a solution.	Theory and applications of conductivity http://www.evisdom.com/
9	Study of 8085 microprocessor.	Students should able to understand pin diagram, block diagram and architecture of 8085 microprocessor.	http://8085projects.info/

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 101.1	3	1	1	1	2	3	2	-	-	3	-	3	2	1	-
BT 101.2	3	2	2	-	3	3	-	-	-	3	-	3	2	2	-
BT 101.3	3	3	3	-	-	3	-	-	-	3	-	-	3	2	-
BT 101.4	3	2	2	2	2	2	-	-	-	3	-	-	2	2	-

Course: PYTHON FOR BIOLOGISTS**Course Code: BI101****L T P H C****2 0 4 6 4****Marks: 150****OBJECTIVE:**

The course is designed to enable the students understand the basics of Python programming and design scripts for analysis of biological data.

COURSE OUTCOMES:

CO No.	At the end of the course, the learner should be able to:
BI101.1	Apply Primitive and Non-Primitive Data types and use conditional statements
BI101.2	Make use of functional libraries, modules, and platforms
BI101.3	Apply Regular Expressions and file handling
BI101.4	Demonstrate the capability of writing in-house scripts and analyze biological data.

PRE-REQUISITE

Basic Knowledge and Understanding of Computer.

COURSE DESCRIPTION

Unit	Topics	Detail Syllabus	Lectures
1	Introduction to computer system and OOP	Basic Computer Architecture, operating systems etc., Feature(s) of object-oriented programming (OOP), Programming Languages used for biological data analysis with their relevance.	4
	Python Programming Fundamentals	A Brief History of Python, Applications areas of Python, Python data types, Python data structures – lists, tuples, strings, dictionaries, sets, type conversion in python, conditions and if statements - if else and elif, standard input & output, Python flow control: For loop, While Loop, Break: Breaking the Loop.	7
2	Python Functions and Modules	Python functions: string and list operations, list operations – concatenations, splice, add or remove elements, copy etc; Modules and Packages: Importing Modules, writing own modules, Standard library modules, dir () Function, Working with modules like Pandas, Numpy, Scipy etc., Functional Programming features like Lambda, Map, Filter, Reduce.	9
3	Python Regular Expressions and File Handling	Python regular Expressions – match, substitute, translate, binding operator; File handling in Python – opening a file in read only mode, write mode, append mode, A Special Kind of File: CSV, Functions from the CSV Module.	4
4	Biological Data analysis: Case studies	Use of Python packages and libraries relevant to the different biological data type, Python web integration -Python-CGI and working on Jupyter Notebook.	6
Total no. of Lectures			30

METHODOLOGY:

The course will be covered through lectures, demonstration, and practicals.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		05
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS RECOMMENDED:

1. Python Programming for Beginners. Code One Publishing. 2023. ISBN-13:979-8361503742
2. Python Crash course, 3rd Edition – December 2022, 552pp A Hands-on, Project Based Introduction to Programming by Eric Matthes
3. Conceptual Programming with Python By Thorsten Altenkirch and Isaac Triguero, 2020, ISBN :9780244277567
4. Python for Bioinformatics By Sebastian Bassi 2nd edition, 2017, ISBN-10 1138035262, ISBN-13 978-1138035263
5. Python for Bioinformatics By Sebastian Bassi 2nd edition 2018
6. Advanced Python for Biologists by Martin Jones ,2014, ISBN-10 1495244377, ISBN-13 978-1495244377
7. Martin Jones, PYTHON FOR BIOLOGISTS: A complete programming course for beginners. Createspace Independent Publishing Platform. 2013. ISBN-13: 978-1492346135

PRACTICALS for PYTHON FOR BIOLOGISTS (4 Hs. Per Week) MARKS 100

Sr. no.	Name of the experiment
1	Installation of Python on Windows desktops
2	Write a python script to take DNA sequence as input and calculate and print the length of input sequence
3	Write a Python script to take DNA sequence as input and convert it into RNA and print the RNA transcript
4	Write a Python script to take the DNA sequence as input and calculate the total number of A,T,G,C and the GC content of the input DNA sequence
5	Write a program to check whether the input recognition sequence is present in the input DNA sequence
6	Write a Python script to read a fasta format protein sequence from a file and calculate the protein composition - frequency of amino acid/total length of protein
7	Write a Python script to convert an input DNA sequence into an RNA sequence using the substitute operator
8	Using regular expressions, write a Python script to print the reverse complement of the input sequence
9	Write a Python script to check the quality of primer - length and melting temperature - calculate the melting temperature of an input primer sequence using the formula $T_m=4(G+C)+2(A+T)$
10	Write a Python script to identify the longest Open reading frame in a given DNA sequence read in all 6 frames
11	Reading a data frame through Pandas and basic biological data analysis using Jupyter notebook.

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	40
End semester examination:	60
Total:	100

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BI 101.1	1	1	-	-	-	-	-	-	-	-	-	-	1	-	-
BI 101.2	1	1	-	-	-	-	-	-	1	-	-	-	1	-	-
BI 101.3	1	1	-	-	-	-	-	-	-	-	-	-	1	-	-
BI 101.4	1	1	1	-	1	1	-	-	1	-	1	-	1	-	-

COURSE: COMMUNICATION SKILLS**COURSE CODE: HU101****MARKS: 50****L T P H C****1 1 0 2 2****OBJECTIVE:**

The objective of this course is:

- To develop communication skills amongst students,
- To familiarize students with communication elements,
- To acquaint them with the scientific reading, Writing & Presentation skills.
- To familiarize students with concepts in plagiarism.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
HU101.1	Display skills in different and appropriate ways of communication
HU101.2	Proficiently compose well-structured and coherent documents such as emails, reports and essays
HU101.3	Demonstrate competence in verbal skills and different types of documentations like scientific report writing and research papers
HU101.4	Follow ethical practices of communication

PREREQUISITES:

This is an introductory course and there are no prerequisites.

COURSE DESCRIPTION:

Unit	Topics	Detail Syllabus	No. of Lectures
1	Introduction to communication	Elements, definitions Scope of communication and communication as part of science	02
2	Communication elements	Verbal and nonverbal communications. Principles of effective communication, Oral presentations, Barriers to communications, Use of good English: Introduction to English Grammar: parts of speech, use of articles & prepositions, use of correct tense, spellings etc.	03
3	Scientific reading, writing & presentation	Introduction to scientific reports and writings? Compilation of experimental data, Communication methods in science, Use of good English in science, Examples of Scientific and Unscientific writing. Process of Scientific writing: thinking, planning, rough drafts and revising context. Different styles of scientific writing APA, MLA or Chicago. Writing papers Reviews and Bibliography	07
4	Plagiarism	Introduction to Plagiarism Examples of Plagiarism	03
Total Number of Lectures			15

METHODOLOGY

The course will be covered through lectures supported by tutorials. During tutorials, students would be made to present scientific and nonscientific data/information using different communication skills. They would be corrected as and when needed and taught how to improve their skills in reading, writing and data presentation.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	60
Total		50

BOOKS RECOMMENDED:

1. Technical Writing and Professional Communication by T. N. Huckin and L. O. London, William Collins and Sons, 1990.
2. Business English and Communication- By L. Clark and Zimmer, New York Mcgraw Hill, 1990.
3. Developing Communications by K. Mohan and M. Banerji, Macmillan India Limited, 2000.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
HU 101.1	-	-	-	-	2	-	-	1	2	3	2	3	-	-	1
HU 101.2	-	-	-	-	2	-	-	-	2	3	1	3	1	1	1
HU 101.3	-	-	-	-	1	-	-	-	2	3	2	3	1	1	2
HU 101.4	-	-	-	-	2	-	-	-	3	3	2	3	1	1	3

COURSE: Maths I – MATHEMATICS**COURSE CODE: BS103****MARKS: 50****OBJECTIVE**

The objective of the course is to familiarize the student with basic concepts in mathematics.

L T P H C
2 0 0 2 2
COURSE OUTCOME

CO No.	At the end of the course, the learner should be able to:
BS103.1	Recall the basics of logarithms and binomial expansions
BS103.2	Explain various trigonometric functions and their factorization
BS103.3	Illustrate various mathematical functions and evaluate their limits
BS103.4	Discuss the concepts of derivatives and their applications
BS103.5	Apply the fundamentals of integral calculus to determine area and volume
BS103.6	Analyze various types of differential equations

PREREQUISITES

Students should be familiar with school level mathematics to take up this course. In case they do not have mathematics at the 10+2 level they should have cleared the core mathematics in the first semester.

COURSE DESCRIPTION

Unit	Topics	Detail Syllabus	No. of Lectures
1	Algebra	Logarithms: Definition of Logarithm, Natural and common logarithm, Relation between Natural and Common logarithm, Laws of Logarithm (Logarithm of product, Logarithm of quotient, Logarithm of power, Rule of Change of Base). Binomial Theorem: Definition, Binomial Expansion, Properties of Binomial Coefficient, General term, Middle term, Binomial theorem for any index	05
2	Trigonometry	Trigonometry Basics, Trigonometric Ratios, T-ratios of standard angle, Measurement of T Ratios, Addition, subtraction, and transformation formula, Relation Between T ratios, Quadrants sign of T-ratios in various quadrants, Inverse Trigonometric Functions: Definition of Inverse t-functions	05
3	Function and Limit	Function & Variable: Definitions of variable, Constant. Definitions of function, value of function, domain & range of a function. Limits: Concepts and definition of Limit, Limits of algebraic functions, trigonometric functions, exponential functions, logarithmic function.	05
4	Derivatives	Definition of Derivatives, Notations, Rules of Derivatives, Derivatives of composite functions, Derivatives of Inverse trigonometric function, Derivatives of Implicit functions, Logarithmic differentiation.	06

		Application of Derivatives: Geometrical meaning of the derivatives.	
5	Integration	Definition of integration, Integration of Standard function; Rules of Integration, Integration of rational functions; Trigonometric functions to determine constant of Integration. Definite Integration: Definition of Definite integral, Definite integral with simple problems Application of Definite Integrals: Area under the curves.	05
6	Differential Equation (D.E.)	Definition of D.E, Order & degree of D.E, formation of D.E for function containing single constant. Solution of D.E. of first order & first degree such as: i) Variable separable type. ii) Equation reducible to variable separable form by substitution.	04
Total Number of Lectures			30

METHODOLOGY

The course will be covered through lectures supported by tutorials. In tutorials difficulties would be solved. Problems would be given. Students would be given assignments in the form of questions. There will be two class tests/ and surprise test conducted during the tutorial classes.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		05
End Semester Exam	1 hours 150 minutes	30
Total		50

BOOKS RECOMMENDED:

- 1) Mathematics for Biological Science by J. Arya & Ladner, Prentice Hall, 1979.
- 2) Numerical methods by E. Balguruswamy, Tata Mc Graw Hill Publications Pvt Ltd., 1999.
- 3) Higher Engineering Mathematics by B. S. Grewal, Khana Publication, New Delhi, 2003.
- 4) Applied Mathematics by P. N. Wartikar, Pune Vidayapeeth, Griha Prakashan, Pune, 2010.
- 5) Introductory Methods of Numerical analysis by S. S. Sastry, Prentice Hall of India, New Delhi. 2005.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BS 103.1	3	3	2	-	-	-	-	-	-	1	-	-	1	2	-
BS 103.2	3	3	2	-	-	-	-	-	-	1	-	-	1	2	-
BS 103.3	2	1	2	-	-	-	-	-	-	1	-	-	1	1	-
BS 103.4	2	1	1	-	-	-	-	-	-	1	-	-	1	2	-
BS 103.5	3	2	2	-	-	-	-	-	-	1	-	-	1	2	-
BS 103.6	3	3	3	-	-	-	1	-	-	1	-	-	1	2	-

COURSE: APTITUDE BUILDING -I**COURSE CODE: BTAEC101****L T P H C****MARKS: 50****0 0 2 2 1****OBJECTIVE**

1. To enhance the logical reasoning skills of the students and improve problem-solving abilities
2. To strengthen the ability of solving quantitative aptitude problems

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BTAEC101.1	Learn to defend and critique concepts of logical reasoning
BTAEC101.2	Develop expertise in solving problems of quantitative Aptitude
BTAEC101.3	Develop technical skills
BTAEC101.4	Develop analytical understanding

PREREQUISITE:

Students should be familiar with basic scientific concepts to take up this course.

COURSE DESCRIPTION

Sr no.	Practical/Training/Tests/Interviews	No. of Lectures
1	Lessons on Excellence	02
2	Thinking Skill	02
3	Logical Reasoning	04
4	Puzzle solving	02
5	Attention to detail	02
6	Quantitative Aptitude	06
7	Technical Sessions on Biophysics	02
8	Technical Sessions on Chemistry and Biochemistry	02
9	Technical Sessions on Electricity and Biological System	02
10	Competitive Examination Preparation	02
11	Mock Interviews	02
12	Discussion session-Industry Experts/Academia Experts/Alumni	02
	TOTAL	30

METHODOLOGY

The course will be covered through Lectures/Assignments/Practical/Training/Tests/Interviews

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Continuous Internal Assessment		20
Attendance		
Assignments/Practical/Training/Tests/Interviews		30
Total		50

BOOKS RECOMMENDED:

1. R. S. Aggarwal, (2017). Quantitative Aptitude for Competitive Examinations, 3rd (Ed.). New Delhi: S. Chand Publishing
2. ETHNUS, (2016). Aptimithra, 1st (Ed.). Bangalore: McGraw-Hill Education Pvt. Ltd. Reference Book(s):
3. Arun Sharma, (2016). Quantitative Aptitude, 7th (Ed.). Noida: McGraw Hill Education Pvt. Ltd.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BTAEC101.1	-	1	1	-	1	-	-	-	-	-	-	1	2	-	-
BTAEC101.2	1	1	1	-	-	-	-	-	-	-	-	-	1	-	-
BTAEC101.3	1	1	1	-	1	-	-	-	-	-	-	-	1	-	-
BTAEC101.4	1	1	1	-	1	-	-	-	-	-	-	-	1	-	-

SEMESTER II						
Course Code	Course Name	L	T	P	H	Cr
BT201	Biochemistry	3	0	4	7	5
BT202	Cell Biology	3	0	2	5	4
BS201	Maths II -Statistics	2	0	2	4	3
BT203	Engineering Mechanics	2	0	2	4	3
BS202	Environmental Sciences	2	0	2	4	3
BT204	Engineering Graphics	1	0	2	3	2
HU201	Disaster Management*	0	1	0	1	-
BTIKS201	History of Indian Science	1	0	0	1	1
BTAEC201	Aptitude Building-II (includes Competitive exam preparation, placement related sessions and alumni interactions and trainings)	0	0	2	2	1
Total		14	1	16	31	22
<i>*Audit course, attendance is must</i>						

COURSE: BIOCHEMISTRY**COURSE CODE: BT201****MARKS: 200****L T P H C****3 0 4 7 5****OBJECTIVE:**

The objective of the course is to familiarize the students to

- Chemical reactions that occur in living organisms in order to maintain the cellular and physiological activities of life
- How to maintain homeostasis between the synthesis and degradation of products.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BS201.1	Classify biomolecules based on their structure and function
BS201.2	Categorize cellular pathways of anabolism and catabolism
BS201.3	Illustrate pathways of carbohydrate metabolism and their significance
BS201.4	Illustrate the pathways of lipid and amino acid metabolism and their significance
BS201.5	Explain the concept of oxidative phosphorylation and electron transport chain for ATP synthesis
BS201.6	Perform isolation of important biomolecules and their qualitative analysis

PREREQUISITES:

The course requires that the students shall be aware about the basics of chemistry and biomolecules.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1.	Biomolecules and Bioenergetics	Carbohydrate: Structure and classification of Monosaccharides, Oligosaccharides and Polysaccharides. Derived sugars.	3
		Amino acids: Structure, classification and properties	2
		Protein: Classification and functions Structure: Primary, Secondary, tertiary, quaternary	3
		Nucleic acids: Structure of nucleotides, DNA and RNA	2
		Fatty acids and lipids: Structure and classification. Compound lipids	2
		Enzymes: Classification and concept of regulation	2
		Vitamins and coenzymes	2
2.	Survey of metabolism	Introduction to metabolism-catabolism, anabolism and intermediary metabolism.	1

3.	Glycolysis	Glycolytic pathway and energetics	2
		Anaerobic pathway of glucose metabolism	1
	Gluconeogenesis and Glycogen Metabolism	Bypass reactions, Regulation of gluconeogenesis by enzymes and hormones.	2
		Glycogenolysis and glycogenesis	4
Citric acid cycle	Aerobic pathway of glucose metabolism. Balance sheet. Regulation of the cycle.	3	
4.	Lipid Metabolism	Requirement of carbon dioxide and citrate for biosynthesis, FAS complex and regulation of biosynthesis	3
		β -oxidation of monounsaturated and polyunsaturated fatty acids, Energetics of β oxidation.	3
	Amino acid metabolism	Transamination, deamination and decarboxylation reactions, Urea cycle	2
5.	Electron transport chain and Oxidative phosphorylation	Complexes I, II, III and IV, components of electron transport chain and their structure. Reactions of the electron transfer.	2
		Oxidative phosphorylation, structure of ATPase enzyme, chemiosmotic hypothesis.	2
6.	Biosynthesis of amino acids and its regulation	Glutamate, glutamine, arginine from α - ketoglutarate	4
Total Number of lectures			45

METHODOLOGY:

The course should be taught through interactive lectures and demonstrations, which will help all the students to correlate the subject to everyday activity.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	60 minutes	20
II Internal	45 minutes	15
Attendance		5
End Semester Exam	2 hours 30 minutes	60
Total		100

BOOKS RECOMMENDED:

1. The principles of Biochemistry, Lehninger by D. Nelson, and M. Cox, 7th edition, M. W.H. Freeman and Company, New York, 2017.
2. Metabolic Pathways by D. M. Greenberg, 3rd edition, Academic Press, Elsevier Science & Technology Books, 2014.
3. Biochemistry by L. Stryer, 7th edition, W.H. Freeman and Company, New York, 2012.
4. Biochemistry by J. M. Berg, J. L. Tymoczko, L. Stryer, 6th edition, W.H. Freeman and Company, New York, NY, 2007.
5. Biochemistry by G. Zubay, Addison-Wesley Educational Publishers Inc, 1983.

PRACTICAL IN BIOCHEMISTRY (4 Hs. PER WEEK) MARKS 100

Sr. No.	Name of the experiment	Learning objective	Literature/ Weblinks for reference and videos
1	Preparation of standard solutions.	To understand the concepts of Normality, Molarity, Molality and ppm.	An Introduction to Practical Biochemistry by D. T. Plummer, 3 rd edition, Tata McGraw Hill Education Private Limited, New Delhi, 2011.
2	Verification of Beer Lambert's law and determination of λ_{\max} of CuSO ₄ /KMnO ₄ solution.	To understand the basic principles of colorimetry	
3	To find out the pka value of glycine using titrimetric method.	Study of principles of titrimetry and understanding the concepts of pH, pKa, and pKb.	
4	Qualitative analysis of carbohydrates (Monosaccharides, disaccharides and polysaccharides)	To understand the chemistry of a compound and the importance of different reagents.	1. Experimental Biochemistry, A student Companion by B. S. Rao and V. Deshpande, I.K. International Publishing House Pvt. Ltd, 2005. 2. Qualitative testing for carbohydrates by J. O. Schreck and W. M. Loffredo, Chemical Education Resources, Inc., 1994.
5	Qualitative analysis of amino acids	To confirm the presence of amino acids based upon the presence of functional group.	Practical manual of Biochemistry by S.P. Singh, 5 th edition, 2011
6	Qualitative analysis of lipids (unsaturated oils, glycerol and cholesterol)	To study the physical properties of lipids as solubility, emulsification and other chemical characteristics such as acidic nature.	3. Experimental Biochemistry, A student Companion by B. S. Rao and V. Deshpande, I.K. International Publishing House Pvt. Ltd, 2005.
7	Qualitative analysis of proteins using different tests	To understand the biochemical properties of proteins.	www.biologydiscussion.com
8	Quantitative estimation of proteins using Biuret/ Lowry method/ Bradford method	To understand the method of quantification of proteins in mg/ μ g.	<input type="checkbox"/> Hawk's physiological chemistry by B. L. Oser, 14th edition, McGraw-Hill Book Company., New York, N. Y., 1996. <input type="checkbox"/> Review of Physiological Chemistry by H.A. Harper, V.W. Rodwell, P.A. Mayes, Harold Anthony, 17 th edition, Lange Medical Publications, Los Altos California, 1979.

9	Estimation of reducing sugar by DNSA method	To understand the method of quantification of sugars in mg/ μ g.	Use of dinitrosalicylic acid reagent for determination of reducing sugar, G.L. Miller, , <i>Anal. Chem.</i> , 31, 426, 1959.
10	Isolation of starch and casein	To understand the methods for isolation of biomolecules and their quantification	Hawk's physiological chemistry by B. L. Oser, 14th edition, McGraw-Hill Book Company., New York, N. Y., 1996.
11	Acid value of oil / saponification value	To understand the quality of and nutritional value of lipids.	An Introduction To Practical Biochemistry by D. T. Plummer, 3 rd edition, Tata McGRAW-HILL Edition, 1998.

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	40
End semester examination:	60
Total:	100

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BS 201.1	2	3	3	3	-	-	-	-	-	3	-	-	2	1	1
BS 201.2	3	3	3	2	2	2	-	-	-	2	-	-	3	3	1
BS 201.3	2	2	3	3	-	2	-	-	-	3	-	-	2	2	1
BS 201.4	2	3	3	3	-	2	-	-	-	2	-	-	3	2	1
BS 201.5	2	3	3	2	-	2	-	-	-	2	-	1	3	2	1
BS 201.6	2	2	3	3	2	3	-	-	2	1	-	1	3	3	3

COURSE: CELL BIOLOGY**COURSE CODE: BT202****MARKS: 150****L T P H C****3 0 2 5 4****OBJECTIVE :**

The objective of the course is to familiarize the students with basic concepts of cell Biology. This is essential for taking further courses in Biotechnology during the next couple of years.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BS202.1	Explain the basic cell structure, classification, and pre-cellular evolution of prokaryotic and eukaryotic cells
BS202.2	Illustrate the instrumentation and application of different types of microscopic techniques to study cell structure
BS202.3	Outline the structure and function of cell organelles, membrane structures and different transportation models of biomolecules
BS202.4	Demonstrate cell cycle and division of prokaryotic and eukaryotic cells
BS202.5	Outline cell signalling molecules and their receptors and illustrate programmed cell death and its significance
BS202.6	Summarize importance of stem cells in cell differentiation and causes of neoplastic transformation

PREREQUISITES

This is an introductory course. There are no prerequisites for the course.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1.	Introduction	Pre-cellular evolution: artificial evolution of cells, RNA world hypothesis, Postulates of cell theory, Endosymbiotic theory, Broad classification of cell types, Comparative study on Prokaryotic cell and Eukaryotic Cell (Animal and Plant Cell)	3
2.	Methods to study cell structure and function and model organisms used in cell biology	Light Microscopy, Electron Microscopy, Fluorescence Microscopy, Confocal Microscopy, Deconvolution Microscopy, Flow cytometry and Cell sorting, Subcellular Fractionation, Introduction to animal cell, plant cell and virus culture, Immunocytochemistry and immunohistochemistry. Model organisms: <i>E. coli</i> , <i>S. cerevisiae</i> , <i>D. discoideum</i> , Hydra, <i>C elegans</i> , <i>D. melanogaster</i> , Zebrafish, <i>A. thaliana</i> , etc. Emerging Model Organisms.	6
3.	Cell surface	Cell wall and extracellular matrix. Cell membrane: Structure and functions, Membrane proteins, lipids and sugar modifications for different membrane types. Ion channels. Transport across the membrane, Exo and Endocytosis Cell to cell interaction.	6
	Structure and function of cell organelles along with	Cytosol, Golgi bodies, ER (smooth and rough), Ribosomes, Cytoskeleton structures (Actin and cell movements,	10

	difference in membrane composition.	Microtubules and cell division, cytoskeleton dynamics and treadmilling), Nucleus (Structure of nuclear envelop, internal organization, nucleolus), Mitochondria (Structure, respiratory chain complexes, ETC, ATP synthase structure, Mitochondrial biogenesis, maternal inheritance, anterograde and retrograde signaling), Chloroplasts, Lysosomes, Peroxisome. Different diseases in relation to cell organelles.	
4.	Cell division (prokaryotic and eukaryotic) and cell cycle	Fission and fusion, budding. Eukaryotic Cell cycle stages (mitosis and meiosis), Nuclear organization during mitosis, Events of M phase, Regulators of cell cycle, Fertilization, Cell proliferation during development.	5
	Protein transport	Transportation of proteins into the nucleus and mitochondria, Vesicular transportation.	3
5.	Cell receptors and signal transduction	Signaling molecules and their receptors. Function of surface and intracellular receptors, Different pathways of signal transduction, Signaling in development and differentiation.	4
	Programmed cell death and Cellular senescence	Apoptosis (intrinsic and extrinsic pathways), Necrosis, Necroptosis, Autophagy (macroautophagy and microautophagy), Cellular senescence, Methods to study cell death.	4
6.	Basic Concepts in developmental biology	Cell lineage and cell-cell interaction, Embryonic induction, Types and importance of stem cells, Cell differentiation, Causes of abnormal cell division and neoplastic transformation	4
Total Number of Lectures			45

METHODOLOGY

The course would be taught through lectures, demonstrations and practical classes.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	60 minutes	20
II Internal	45 minutes	15
Attendance		5
End Semester Exam	2 hours 30 minutes	60
Total		100

BOOKS RECOMMENDED:

1. Molecular Biology of the Cell; B. Alberts, A. Johnson, J. Lewis, M. Raff, K. Roberts, P. Walter; 6th Edition, Garland Sciences, 2015.
2. Molecular Cell Biology; H. Lodish, A. Berk, Chris A. Kaiser, Monty Krieger, Anthony Bretscher, Hidde Ploegh, Angelika Amon, Kelsey C. Martin; 8th Edition; 2016
3. The Cell: A Molecular Approach; Geoffrey M. Cooper, Robert E. Hausman; 7th Edition; Sinauer Associates, Inc., 2015.

PRACTICAL IN CELL BIOLOGY (2 Hs. PER WEEK)

MARKS 50

Sr. No	Name of Experiment	Learning objective	References
1.	Introduction to the instruments used in cell biology (Microscope, Biosafety Cabinets, Incubators, Centrifuges, Pipettes)	To get acquainted with the instruments and SOP for the various instruments. This Exercise focuses on how to develop a working knowledge of the microscopes and their uses. Students should identify the different parts of the Microscope and safe handling.	Fundamentals of Light microscopy And electronic Imaging by D. B. Murphy, John Wiley & Sons, Inc., Publication. 2001
2.	Study of different cell types under microscope	Students should be able to differentiate between prokaryote, eukaryote cells Should be able to differentiate between plant and animal cells Should be able to differentiate between cells from different tissues	
3.	Slide preparation and staining (plant)	Cross-sectioning of monocot and dicot plant root, stem and leaf Staining and slide preparation Identification of different anatomical features Preparation of permanent slide	A Text-Book of Histology Descriptive and Practical. For the Use of Students by A. Clarkson, 2 nd edition, Science Direct, 2013. Methods in plant histology by C. Joseph, 3 rd edition, The university of chicago press Chicago, Illinois, The Baker & Taylor Company, 2007
4.	Blood Smear Preparation and differential staining.	A classical method for identification of blood cell preparation.	Dacie and Lewis Practical Haematology by B. Bain, I. Bates, M. Laffan, 11 th edition, Elsevier, 2016.
5.	Buccal smear – Identification of Barr Body	A quick cytological method for identification of sex in mammals- an extreme case of chromosomal condensation.	Cytological Assessment of Barr Bodies Using Aceto-Orcein and Papanicolaou Stains in Buccal Mucosal Smears and Their Sex Estimation Efficacy in an Indian Sample, D. U. Angadi P. V.

			Hallikerimath and S. Kale, <i>Acta Cytologica</i> , 57:516-521, 2013 (DOI:10.1159/000353216)
6.	Mitosis in Onion Root-Tip Cells	To study mitosis using Onion root tip cells.	Science Volume 61 of Methods in cell biology by Conly L. Rieder. Academic Press, 1999.
7.	Meiotic cell division in grasshopper testis/Hibiscus flower buds	To perform Meiotic cell division in the given sample	

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BS 202.1	1	2	3	-	1	1	-	-	-	1	-	-	3	2	1
BS 202.2	3	3	3	-	3	2	-	-	-	2	2	3	1	3	1
BS 202.3	3	3	3	-	3	2	-	-	-	2	-	3	3	1	1
BS 202.4	3	3	3	3	3	2	-	-	-	2	-	3	3	1	1
BS 202.5	3	3	3	3	3	3	-	-	2	2	-	3	3	1	1
BS 202.6	3	3	2	3	3	3	2	3	3	2	-	3	2	2	3

COURSE: Maths II: STATISTICS**COURSE CODE: BS201****MARKS: 100****L T P H C****2 0 2 4 3****OBJECTIVE**

The objective of the course is to familiarize the student with basic concepts in mathematics & statistics.

COURSE OUTCOME

CO No.	At the end of the course, the learner should be able to:
BS203.1	Define determinants and matrices for solving simultaneous equations
BS203.2	Outline the principles of complex numbers and numerical methods
BS203.3	Use the set theory, probability and probability distribution for solving statistical problems
BS203.4	Apply the concept of correlation, regression and various hypothesis testing methods to statistical data

PREREQUISITES

Students should be familiar with school level mathematics to take up this course. In case they do not have mathematics at the twelfth level they should have cleared the core mathematics in the first semester.

COURSE DESCRIPTION

Unit	Topics	Detail Syllabus	No. of Lectures
1	Determinant & Matrices :	Determinant: Definition & expansion of determinant of order 2 and 3, Cramer's rule Matrices: Definition of Matrix of order $m \times n$ and types of Matrices, Algebra of Matrices, Transpose of a Matrix, Inverse of a Matrix by adjoint method, Solution of simultaneous equations	06
2	Complex Number :	Definition of Complex number, Cartesian, polar, exponential forms of complex number. Algebra of Complex Number De - Moivre's theorem (without proof) and simple problems.	03
	Numerical Methods :	Numerical Solution of Simultaneous Equations : Gauss elimination method Iterative Methods Gauss Seidal and Jacobi's Method	03
3	Set Theory and Probability	Set Theory Probability: Definition of random experiments,	06

		sample space, events, occurrence of event and types of events, Definition of probability, addition and multiplication theorem of probability. Probability Distribution: Binominal Distribution, Poisson's Distribution, Normal Distribution	
	Statistics	Frequency Distribution Measures of Central tendency (For Raw, Ungroup & group Data) Measures of Dispersion: Range, Variance, Coefficient of Variation, Standard Deviation	01 03 02
4	Correlation & Regression	Correlation & Regression	02
	Hypothesis Testing	ANNOVA, Chi square Test	03
	F-Test	F-Test	01
Total Number of Lectures			30

METHODOLOGY

The course will be covered through lectures supported by practicals.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hour 15 minutes	30
Total		50

BOOKS RECOMMENDED:

1. Ravid, R. (2024). *Practical statistics for educators*. Rowman & Littlefield.
2. Dr. S.P.Gupta, 46th Edition, 2021, ISBN 93-5161-176-9. *Statistical Methods*
3. Bruce, P., Bruce, A., & Gedeck, P. (2020). *Practical statistics for data scientists: 50+ essential concepts using R and Python*. O'Reilly Media.
4. S. G. Gupta. 17th edition, Himalaya Publications 2000. *Fundamentals of Statistic*
5. Van Emden, H. F. (2019). *Statistics for terrified biologists*. John Wiley & Sons.

PRACTICAL IN Maths II: STATISTICS**(2 Hs. Per Week)****Marks: 50**

Sr. No.	Name of experiment	Learning objectives
1.	Introduction to statistical computing.	Understand concepts and ideas behind mathematical and statistical computing.
2.	Exploring statistical packages such as SYSTAT/ SPSS/ SAS.	Explore statistical package environment: features, workspace, menu, and user interface.
3.	Biological data handling in statistical package.	Recognize the difference between biological and other data.
4.	Data exploration with graphs.	Draw various types of graphs.
5.	Computation of measures of central tendency.	Learn how to compute and interpret various measures of central tendency.
6.	Computation of measures of dispersion.	Learn how to compute and interpret various measures of dispersion.
7.	Computation of correlation coefficient.	Learn how to compute and interpret correlation coefficient.
8.	Curve fitting, construction of regression models and computation of regression coefficient.	Understand data modeling and learn to visualize and measure relationship between variables by constructing various models.
9.	Analysis of variance (ANOVA).	Understand and perform ANOVA test.

References:

1. Fundamental of Statistics by S.C. Gupta, 17th edition, Himalaya Publications, 2000 .
2. Fundamentals of Mathematical Statistics by S.C. Gupta and Kapoor, S. Chand Publications, 1987.
3. Fundamental of Biostatistics by B. Rosner, 7th edition, Cengage Learning Publisher, 2010.
4. Biostatistics: Bare essentials by G. R. Norman and D. L. Streiner, McGraw-Hill Medical Publisher, 2014.
5. Statistical methods in Bioinformatics by W. J. Ewens and G. R. Grant, 2nd edition, Springer, 2005.
6. The Practice of Business Statistics (w/CD) by Manish Sharma and Amit Gupta, Khanna Publishing House, 2010

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BS 203.1	1			2	1		1	1			2	1	2	1	
BS 203.2	2				1		1	2				1	2	2	
BS 203.3	2			2	2		2	2			2	2	2	2	1
BS 203.4	1	2		2	1	1	2	1	2		2	1	2	2	1

COURSE: ENGINEERING MECHANICS**COURSE CODE: BT203****MARKS: 100**
L T P H C
2 0 2 4 3
OBJECTIVES:

The objective of the course is to familiarize the students with the basic concepts of engineering mechanics.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT203.1	Illustrate various force systems and their impacts using vector algebra
BT203.2	Analyze the equilibrium of rigid bodies using free body diagram and apply the laws of friction
BT203.3	Calculate impulse, momentum and impact of elastic bodies using principles of kinematics
BT203.4	Apply the concepts of mechanics in life sciences

PREREQUISITES:

Since the course is technical in nature the students must have the basic knowledge of Math and Physics.

COURSE DESCRIPTION:

Unit	Topic	Detail Syllabus	No. of Lectures
1	Basics of Mechanics	Introduction, Unit and Dimensions, Laws of Mechanics, Vectors – Victorian representation of forces and moments, Vector operations	3
2	Statics of particles	Principal of statics, force systems, Principle of transmissibility, Resolution and Composition of forces, Resultant of concurrent forces, Moment of a force, Resultant of parallel force system, Couple	6
3	Free body diagram	Free body diagram, Types of supports and their reactions, Requirements of stable equilibrium, Equilibrium of a particle, Equilibrium of a particle in space, Equilibrium of rigid bodies in two dimensions, Equilibrium of rigid bodies in three dimensions, Types of beams-Simple and compound beams	7
	Friction	Frictional Force, Laws of Coulomb friction, Simple Contact friction	3
4	Dynamics kinematics	Basics of Kinetics and kinematics, Relative motion, Newton's Law of Motion, Conservation of energy and Work Energy Equation of particles. Impulse and Momentum, Impact of	6

		elastic bodies, Direct central impact and coefficient of restitution	
	Basics of Biomechanics	Basic concept of Biomechanics, Biomechanics of tissues, muscles, bones and ligaments, Applications	5
Total Number of Lectures			30

METHODOLOGY:

The course would be taught through lectures, demonstrations and practicals

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS RECOMMENDED:

1. Engineering Mechanics by Sanju Unadkat, Seventh edition, Tech-Max publications, 2012.
2. Engineering Mechanics by H.J. Sawant, sixth Edition, Technical Publication, 2012.
3. Engineering Mechanics by DS Bedi, MP Poonia, Khanna Publications, New Delhi, 2018.

PRACTICALS IN ENGINEERING MECHANICS**(2 Hs. Per Week)****50 Marks**

Sr. No.	Name of the experiment	Learning objective	Literature / Web links for reference and videos
1	Study of different force systems.	Students should able to learn different types of force systems and their visual representation.	☐ Engineering Mechanics by S. Unadkat, 7 th edition, Tech-Max publications, 2012. ☐ Engineering Mechanics by H.J. Sawant, 6 th edition, Technical Publication, 2012. https://physics.stackexchange.com/questions/172127/the-coefficient-of-restitution-of-a-bouncing-ball
2	Study of Laws of coplanar forces a) Triangle law b) Parallelogram law c) Polygon law	Students should able to learn and prove 3 different laws for coplanar forces.	
3	Study of equilibrium of forces in space.	Students should able to understand the concept of equilibrium, requirements for stable equilibrium.	
4	Study of collision of elastic bodies.	Students should able to learn law of conservation of momentum and concept of Impact.	
5	Analysis of compound beam	Students should able to identify different supports and their reactions. They should able to draw FBD of simple and compound beams.	
6	Study of flywheel	Students should able to learn basic concepts of dynamics, Moment of inertia.	
7	Study of friction	Students should able to learn basic concept of friction, its types.	
8	To find coefficient of restitution.	Students should able to find coefficient of restitution for different materials.	

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 203.1	-	-	-	2	-	-	1	-	-	-	2	-	2	-	-
BT 203.2	-	-	-	2	-	-	1	-	-	-	2	-	2	2	-
BT 203.3	-	-	-	2	-	-	1	-	-	-	2	-	3	3	3
BT 203.4	3	1	1	3	3	3	3	3	1	1	3	3	1	1	3

COURSE: ENVIRONMENTAL SCIENCE**COURSE CODE: BS202****MARKS: 100****L T P H Cr****2 0 2 4 3****OBJECTIVE :**

To familiarize the students with

- Problems related to environmental pollution, loss of natural resources, climate change, solid waste disposal, biodiversity and social issues due to environmental degradation.
- Develop clear understanding of biodiversity and its conservation.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BS201.1	Demonstrate basic understanding of natural resources, ecosystem, and its structural and functional aspects
BS201.2	Identify the measures to prevent environmental pollution and design strategies for environment conservation
BS202.3	Comprehend different socio-environmental issues and explain the dynamics of human population
BS202.4	Explore environmental problems of local area and suggest sustainable solutions

PREREQUISITES

Since the course is very basic in nature there are no prerequisites.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1	Natural Resources and associated problems	Land, water, food, forest, mineral and energy resources, their use, over-exploitation and conservation.	3
	Ecosystems	Concept, structure and function of ecosystem. Producers, Consumers and decomposers Energy flow in ecosystem. Ecological succession and pyramids, Food chains, food webs and ecological pyramids. Characteristic features of Forest, Grassland, Desert and Aquatic Ecosystems.	4
2	Environmental Pollution	Definition, Causes, Effects and control measures of Air, Water, Soil, Noise, thermal and Marine Pollution. Nuclear hazards and Solid waste management. Role of an individual in prevention of Pollution and Pollution case studies	6

	Biodiversity and its Conservation	Genetic, species and ecosystem diversity. Value of Biodiversity: social, ethical, aesthetic and option values. India as a mega diversity nation. Hotspots of Biodiversity. Threats to Biodiversity: Habitat loss, poaching of wildlife, man wild life conflicts. Endangered and Endemic species of India. Conservation of Biodiversity: in situ and ex situ conservation of biodiversity. Biodiversity act 2002	4 2
3	Social Issues and the Environment	Urban problems related to energy. Water conservation, Rain water harvesting, and watershed management. Resettlement and rehabilitation of people. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Wasteland reclamation: Case studies. Environment protection Acts: Air (Prevention and control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation. Environmental ethics: Issues and possible solutions. Public awareness	4
	Human Population and Environment	Population growth. Population explosion- family welfare programs. Environment and Human Health. Human Rights. HIV/ AIDS and Women and Child welfare. Role of Information and Technology in environment & human health.	3
4	Field work	Visit to a local area to document environmental assets River/forest/grassland/hill/mountain Visit to local polluted site- Urban/Rural/Industrial/Agricultural Study of Common plants, insects, birds. Study of simple ecosystems- pond, river, hill slopes, etc	4
Total number of lectures			30

METHODOLOGY

The course would be taught through lectures, demonstrations and field work. The students will undertake field trip to sensitive hot spots in Western Ghats to observe and collect samples of Flora and Fauna for on the spot studies, collection and identification of specimens. These would be evaluated on the basis of report presented by the students

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS RECOMMENDED:

1. Environmental Biology, K. Agarwal, Nidi Publ. Ltd. Bikaner, 2001.
2. The Biodiversity of India, B. Erach, Mapin Publishing Pvt. Ltd., 2002.
3. Hazardous Waste Incineration, R.C. Brunner, McGraw Hill Inc., 1989.
4. Marine Pollution, R.S. Cark, 5th edition, Clanderson press Oxford (TB), 2001.

5. A Textbook of Environmental Science by Rimpi Mehani Ne'e Chopra, Jyotsna, Khanna Publishers, New Delhi, 2017.
6. Environmental Studies by MP Poonia and SC Sharma, Khanna Publishers, New Delhi, 2017.
7. Elements of Environmental Pollution Control by O. P. Gupta, Khanna Publishers, New Delhi, 2016.

PRACTICAL IN ENVIRONMENTAL SCIENCE (2 Hs. Per Week) MARKS 50

Sr. No.	Name of the experiment	Learning objective	Literature/ Weblinks for reference and videos
1.	To study physicochemical properties of soil (pH, conductivity, moisture content, carbonate content, salinity, porosity)	To know about variations of soil properties and to determine their suitability for a particular purpose	<input checked="" type="checkbox"/> Soil Analysis by P. C. Bandyopadhyay Gene-Tech books, New Delhi, India. 2007. <input type="checkbox"/> Handbook of Water Analysis by M. L. Leo, S. P. Nollet, S. P. Leen, De Gelder. , 3 rd edition, CRC Press, United Kingdom, Publisher: <u>Leen S. P. De Gelder</u> , 2013. <input type="checkbox"/> A Microbiology laboratory Manual by J. G. Cappuccino and N. Sherman, 10 th edition, Dorling Kindersley, Pearson Benjamin Cummings, 2014. <input type="checkbox"/> Principles and Practices of air pollution analysis by J. R. Mudakavi, I K International Publishing House Pvt. Ltd., New Delhi, India, 2010.
2.	Identification and enumeration of zooplanktons and phytoplanktons as indicator of water pollution	To differentiate polluted and non-polluted sites based on plankton data	
3.	To identify and characterize normal microflora in air, water and soil	To know presence of normal microflora within environment.	
4.	Determination of MPN from water samples	Determine potability of water	
5.	Estimation of chlorine in drinking water using colorimetric method	Understanding of residual amount of chlorine in water as a health hazard	
6.	Estimation of relative humidity of the atmosphere	To understand relationship between weather and humidity	
7.	Estimation of dissolved oxygen in the given water sample	To understand importance of BOD and COD	
8.	Study the effects of pollutants (e.g., heavy metals) on flora	To understand effect about pollution	
9.	Determination of NO ₂ from the atmosphere by Colorimetric method using high volume sampler (Optional)	To understand more about atmospheric condition	
10.	Determination of K ₂ O value of soil by flame photometer (Optional)	To understand about Quality of soil	

PRACTICAL EVALUATION SCHEME

SYLLABUS FOR B. TECH. BIOTECHNOLOGY

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BS 201.1	3	3	2	2	1	-	-	3	3	2	2	1	2	1	2
BS 201.2	3	3	1	2	2	2	2	3	3	1	2	2	2	2	1
BS 202.3	2	3	2	2	1	2	2	2	3	2	2	1	2	2	2
BS 202.4	2	3	2	1	1	2	3	2	3	2	1	1	3	2	2

COURSE: ENGINEERING GRAPHICS**COURSE CODE: – BT204****L T P H C****MARKS: 100****1 0 2 3 2****OBJECTIVE :**

To familiarize the students

- basic engineering drawing formats.
- to take data and transform it into graphics drawings.
- to sketch and take field dimensions.

COURSE OUTCOME

CO No.	At the end of the course, the learner should be able to:
BS204.1	Outline the various drawing formats used in engineering graphics
BS204.2	Analyse detailed concepts of geometric tools, shapes and procedures
BS204.3	Sketch various orthographic, auxiliary and isometric projections
BS202.4	Identify lines and surfaces, interpret various views to apply these concepts in tissue engineering

PREREQUISITES

Since the course is very basic in nature, knowledge of mathematics is required.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1.	Drafting Technology and Introduction to Any Drafting Software/Pack age	Layout of drawing sheets, sizes of drawing sheets, different types of lines used in drawing practice, Dimensioning – linear, angular, aligned system, unidirectional system, parallel dimensioning, chain dimensioning, location dimension and size dimension. Tolerances – methods of representing tolerances, unilateral and bilateral tolerances, tolerance on linear and angular dimensions, geometrical tolerances. Symbols used on drawing, surface finish symbols, welding symbols. Advantages of using Computer Aided Drafting (CAD) packages, applications of CAD, basic operation of drafting packages, use of various commands for drawing, dimensioning, editing, modifying, saving and printing/plotting the drawings. Introduction to 3D primitives.	2
2.	Curves used in Engineering Practice	Ellipse, Parabola, Hyperbola, normal and tangents to these curves, Involute, Cycloid, Epi-cycloid, Hypo-cycloid, Archimedean Spiral, Helix on cone and cylinder.	7

3	Orthographic Projections	Reference planes, types of orthographic projections – First angle projections, Third angle projections, methods of obtaining orthographic views by First angle method, Sectional orthographic projections – full section, half section, offset section.	2
	Auxiliary Projections	Auxiliary planes – Auxiliary Vertical Plane (AVP), Auxiliary Inclined Plane (AIP), symmetrical auxiliary view, unilateral auxiliary view, bilateral auxiliary view.	2
	Isometric Projections	Isometric view, Isometric scale to draw Isometric projection, Non-Isometric lines, and construction of Isometric view from given orthographic views and to construct Isometric view of a Pyramid, Cone, and Sphere.	3
4	Interpretation of Given Views/Missing Views	Identification of lines/edges and surfaces, visualization of given orthographic views, adding a missing/third view, adding a sectional view, to convert a given view into a sectional view.	2
Total number of Lectures			18

METHODOLOGY

The course would be taught through lectures, demonstrations and practicals.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS RECOMMENDED:

1. Elementary Engineering Drawing, by D. Bhatt, 53rd edition, Chartor Publishing house, 2014.
2. Engineering Drawing by P.S. Gill, S.K. KAtaria & sons, 2009.
3. Engineering Graphics and Drafting by P.S. Gill, S.K. KAtaria & sons, 2009.
4. Machine Drawing by N.D. Bhatt, 50th Edition, Chartor Publishing house, 2014.

PRACTICAL IN ENGINEERING GRAPHICS (2 Hs. PER WEEK) MARKS 50

Five A2 (594X420mm) (Half imperial) size drawing sheet as detailed below:

1. Sheet No. 1: CURVES
 - o To draw any four curves mentioned in the detailed syllabus.
2. Sheet No. 2: ORTHOGRAPHIC VIEWS
 - o To draw two principal views, one sectional view for two objects.
3. Sheet No. 3: AUXILIARY VIEWS
 - o To draw auxiliary views from the given views for any two objects.
4. Sheet No. 4: ISOMETRIC VIEWS
 - o Two problems on Isometric views.
 - o (*minimum one problem by using CAD software/package*)
5. Sheet No. 5: INTERPRETATION OF GIVEN VIEWS/MISSING VIEWS
 - o Two problems on Interpretation of given views.
 - o (*minimum one problem by using CAD software/package*)

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BS 204.1	3	2	-	1	1	-	1	3	2	-	1	1	1	-	1
BS 204.2	2	1	-	2	2	-	2	2	1	-	2	2	2	1	1
BS 204.3	2	-	-	2	2	-	2	2	-	-	2	2	3	3	1
BS 202.4	3	2	2	2	3	3	3	3	2	2	2	3	3	3	2

COURSE: DISASTER MANAGEMENT**COURSE CODE: HU201****MARKS: 50****L T P H C****0 1 0 1 -****LEARNING OBJECTIVE:**

- To provide student an exposure to disasters, their significance and types.
- To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
- To gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR)
- To enhance awareness of institutional process in the country and
- To develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
HU102.1	Interpret trends in disasters and their types
HU102.2	Demonstrate the relationship between vulnerability, disasters, disaster prevention and risk reduction
HU102.3	Sketch approaches of Disaster Risk Reduction with institutional arrangements
HU102.4	Demonstrate rudimentary ability to respond to the surroundings with potential disaster response

COURSE DESCRIPTION:

Unit	Topics	Detail Syllabus	No. of Lectures
1	Introduction to Disasters	Concepts and definitions (Disaster, Hazard, Vulnerability, Resilience, Risks)	04
	Disasters: Clarification, Causes, Impacts (Including social, economic, political, environmental, health, psychosocial, etc.)	Differential impacts – in terms of caste, class, gender, age, location, disability, Global trends in disasters urban disasters, pandemics, complex emergencies, Climate Change	08
2	Approaches to Disasters Risk reduction	Phases, Culture of safety, prevention, mitigation and preparedness, community based DRR, Structural – nonstructural measures, roles and responsibilities of community, Panchayati Raj Institution / Urban Local Bodies (PRIs/ULBs), states, centre and other Satke-holders	08

	Inter-relationship between Disasters and Development	Factor affecting Vulnerabilities, differential impacts, impact of Development project such as dams, embankments, changes in Land-use etc. Climate Change Adaptation. Relevance of indigenous knowledge, appropriate technology and local resources	04
3	Disaster Risk in India	Hazard and Vulnerability profile of India Components of Disaster Relief : Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional Arrangements (Mitigation, Response and Preparedness, DM Act and Policy, Other related policies, Plans, programmes and legislation)	06
4	Project Work	Field Work, Case Studies	06
Total Number of Lectures			36

METHODOLOGY

The course will be covered through lectures, project work & classroom discussion.

EVALUATION SCHEME (THEORY)

This course attendance is mandatory but university examination may not be conducted.

BOOKS RECOMMENDED:

1. Introduction in “Confronting Catastrophe’ by A. David Oxford University Press, 2000.
2. Vulnerability in Disaster Discourse, by Angharia J. JTCDM, Tata Institute of Social Science working Paper no. 8, 2008
3. At Risk Natural Hazards, Peoples, Vulnerability and Disasters by Blaikie, P, Cannon T, Davis I, Wisner B, Rutledge. 1997
4. Introduction to International Disaster Management, C. P. Damon, 2007,
5. Disaster Management : A Disaster Manager’s Handbook, Carter and Nick, Asian Development Bank, Manila Philippines, 1991.
6. Development and Disasters, Cuny, F., Oxford University Press, 1983.
7. Document on World Summit on Sustainable Development 2012
8. Govt. of India : Disasters Management Act 2005. Government of India, New Delhi
9. Government of India, National Disasters Management Policy, 2009.
10. Environmental Knowledge for Disasters Risk Management, A. K. Gupta, S. S. Nair, NIDM, New Delhi, 2011.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
HU 102.1	-	1	-	-	-	-	1	-	1	1	-	-	-	-	1
HU 102.2	1	1	-	-	-	-	2	-	2	1	-	-	-	-	1
HU 102.3	-	1	-	-	-	-	2	-	2	1	-	-	-	-	1
HU 102.4	-	-	-	-	-	-	2	-	2	1	-	-	-	-	1

COURSE: INDIAN KNOWLEDGE SYSTEM: HISTORY OF INDIAN SCIENCE**COURSE CODE: BTIKS201****L T P H C****MARKS: 50****1 0 0 1 1****OBJECTIVE**

The objective of the course is to familiarize students with the origin and development of science and technology in India.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BTIKS201.1	Learn about science and technology during ancient, mediaeval, colonial and post- independence era of India
BTIKS201.2	Relate remarkable scientific discoveries and inventions by Indian rishis and innovators
BTIKS201.3	Recognize India's contribution in science and technology on a global scenario
BTIKS201.4	Identify notable Indian institutions and visionaries that contributed towards scientific and technological revolutions

PREREQUISITE:

Students should be familiar with basic scientific concepts to take up this course.

COURSE DESCRIPTION

Unit	Topic	Detailed syllabus	No. of Lectures
1.	Introduction to Indian Knowledge System (IKS), definition, concept and scope of IKS	1.1 Definition, Concept and Scope of IKS 1.2 IKS based approaches on knowledge paradigms 1.3 IKS in ancient India, <i>Gurukul</i> -based education system, <i>Viharas</i> and Universities 1.4 Significance of IKS in modern India	2
2.	Science and technology in ancient India	2.1 Diverse scientific fields advanced in ancient India including astronomy, mathematics (geometry, arithmetic, and algebra), engineering, agriculture and medicine; ancient Indian temples: engineering and architectural marvels.	6

		<p>2.2 Notable developments in metallurgy and chemistry: use of copper, iron and bronze in ancient India</p> <p>2.3 Development of geosciences: geographical concepts in ancient Indian literature</p> <p>2.4 Hydrology and water resources management in ancient India</p> <p>2.5 Role of acoustics in Vedic sciences</p>	
3.	Developments in science and technology during medieval India	<p>3.1 Scientific and technological advancements in medieval India; the influence of Islamic and European concepts; advancements in the field of mathematics, astronomy, and medicine.</p> <p>3.2 Innovations in the field of agriculture: introduction of new crops and irrigation techniques.</p>	2
4.	Scientific advancements in colonial and post-independence era	<p>4.1 Scientific breakthroughs in pre-independent India</p> <p>4.2 Contributions of Jamshedji Tata and Swami Vivekananda in nation building and scientific innovation.</p> <p>4.3 Development of research organizations in modern India including CSIR, DRDO; Establishment of Atomic Energy Commission; Developments in space satellites</p>	2
5.	Notable scientists, innovators and visionaries of India: standing on the shoulders of giants	<p>5.1 Philosophy and Literature (e.g., Maharishi Kanad, Pingala)</p> <p>5.2 Mathematics and Astronomy (Aryabhata, Bhashkaracharya, Varahamihira and Brahmgupta)</p> <p>5.3 Medicine and Yoga (Acharya Charak, Susruta, Maharishi Patanjali and Dhanwantri)</p> <p>5.4 Scientists of Modern India including Srinivas Ramanujan, C V Raman, Jagdish Chandra Bose, S N Bose, Har Gobind Khurana, Homi J Bhabha, Vikram Sarabhai, M Visvesvaraya, Birbal Sahni, APJ Abdul Kalam, Yash Pal, Jayant Narlikar, CNR Rao)</p> <p>5.5 Women in STEM including Anandibai Joshi, Janaki Ammal, Kamal Ranadive, Rajeshwari Chatterjee, Indira Hinduja)</p>	4
Total no. of Lectures			16

METHODOLOGY

The course will be covered through lectures & assignments.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS RECOMMENDED:

1. Mahadevan, B., Bhat Vinayak Rajat, Nagendra Pavana R.N. (2022), “Introduction to Indian Knowledge System: Concepts and Applications”, PHI Learning Private Ltd. Delhi.
2. Kapoor Kapil, Singh Avadhesh (2021). “Indian Knowledge Systems Vol – I & II”, Indian Institute of Advanced Study, Shimla, H.P.
3. Acarya, P.K. (1996). Indian Architecture, Munshiram Manoharlal Publishers, New Delhi.
4. Sampad and Vijay (2011). “The Wonder that is Sanskrit”, Sri Aurobindo Society, Puducherry.
5. Pride of India: A Glimpse into India’s Scientific Heritage, Samskrita Bharati, New Delhi.
6. Datta, B. and Singh, A.N. (1962). History of Hindu Mathematics: Parts I and II, Asia Publishing House, Mumbai.
7. Kak, S.C. (1987). On Astronomy in Ancient India, Indian Journal of History of Science, 22(3), pp. 205–221.
8. Subbarayappa, B.V. and Sarma, K.V. (1985). Indian Astronomy: A Source Book, Nehru Centre, Mumbai.
9. Bag, A.K. (1997). History of Technology in India, Vol. I, Indian National Science Academy, New Delhi.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BTIKS201.1	-	-	-	-	-	1	-	-	1	1	-	-	-	-	-
BTIKS201.2	-	-	2	-	-	1	-	2	-	1	-	-	-	-	-
BTIKS201.3	1	1	1	-	-	1	1	-	1	-	-	-	-	-	-
BTIKS201.4	-	-	-	-	-	1	-	-	1	1	-	-	-	-	-

COURSE: APTITUDE BUILDING-II**COURSE CODE: BTAEC201****L T P H C****MARKS: 50****0 0 2 2 1****OBJECTIVE**

1. To enhance the logical reasoning skills of the students and improve problem-solving abilities
2. To strengthen the ability of solving quantitative aptitude problems
3. To enrich the verbal ability of the students for academic purposes

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BTAEC201.1	Learn to defend and critique concepts of logical reasoning
BTAEC201.2	Develop expertise in solving problems of quantitative Aptitude
BTAEC201.3	Integrate and display verbal ability effectively
BTAEC201.4	Develop technical skills

PREREQUISITE:

Students should be familiar with basic scientific concepts to take up this course.

COURSE DESCRIPTION

Sr no.	Practical/Training/Tests/Interviews	Contact Hours
1	Logical Reasoning	04
2	Reading Comprehension for placements	02
3	Quantitative Aptitude	04
4	Verbal Ability	04
5	Recruitment Essentials	04
6	Accuracy, Precision and Statistical Analysis	02
7	Biology, Engineering and Mechanics	02
8	Engineering Graphics-Anthropometry	02
9	Competitive Examination Preparation	02
10	Mock Interviews	02

11	Discussion session-Industry Experts/Academia Experts/Alumni	02
	TOTAL	30

METHODOLOGY

The course will be covered through Lectures/Assignments/Practical/Training/Tests/Interviews

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Continuous Internal Assessment		20
Attendance		
Assignments/Practical/Training/Tests/Interviews		30
Total		50

BOOKS RECOMMENDED:

1. R. S. Aggarwal, (2017). Quantitative Aptitude for Competitive Examinations, 3rd (Ed.). New Delhi: S. Chand Publishing
2. ETHNUS, (2016). Aptimithra, 1st (Ed.). Bangalore: McGraw-Hill Education Pvt. Ltd.
3. Arun Sharma, (2016). Quantitative Aptitude, 7th (Ed.). Noida: McGraw Hill Education Pvt. Ltd.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BTAEC201.1	-	1	1	-	1	-	-	-	-	-	-	1	1	-	-
BTAEC201.2	1	1	1	-	-	-	-	-	-	-	-	-	1	-	-
BTAEC201.3	1	1	1	-	1	-	-	-	-	1	-	-	1	-	-
BTAEC201.4	1	1	1	-	1	-	-	-	-	-	-	-	1	-	-

SEMESTER III						
Course Code	Course Name	L	T	P	H	Cr
BT301	Analytical Techniques	2	0	4	6	4
BT302	Microbiology & Virology	2	0	4	6	4
BT303	Genetics	3	0	2	5	4
BI301	Concepts in Bioinformatics	2	0	4	6	4
BT304	Biosafety, Bioethics & IPR	2	0	0	2	2
HU301	Universal Human Values II	2	1	0	3	3
BTSEC301	NPTEL/SWAYAM/MOOC online course (Based on the courses offered on the MOOCs platform at that point of time)	2	0	0	2	2
BTAEC301	Aptitude Building-III (includes Competitive exam preparation, placement related sessions and alumni interactions and trainings)	0	0	2	2	1
Total		15	1	16	32	24

COURSE: ANALYTICAL TECHNIQUES**COURSE CODE: BT301****MARKS: 150****L T P H C****2 0 4 6 4****OBJECTIVE :**

To create general understanding of centrifugation, chromatographic techniques, various spectroscopic techniques like absorption spectroscopy, fluorescence spectroscopy, Infra-red spectroscopy, Optical Rotatory Dispersion (ORD) & Circular Dichroism (CD) spectroscopy, Nuclear Magnetic Resonance (NMR) Spectroscopy, Electrophoretic techniques, and X-ray crystallography. They would also understand the importance of analytical tools in biotechnology & its applications in various industries.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT301.1	Explore various centrifugation techniques for separation of biological materials at analytical and preparatory level
BT301.2	Demonstrate the basic and advanced knowledge of various spectroscopic techniques for the analysis of biomolecules
BT301.3	Employ various chromatographic techniques for purification of biomolecules
BT301.4	Use different electrophoretic techniques for characterization of biomolecules
BT301.5	Explain X-ray crystallography for 3D structure determination
BT301.6	Apply Surface Plasmon Resonance and Isothermal Titration Calorimetry for studying intermolecular interactions

PREREQUISITES:

This is an introductory course. School level knowledge of physics is sufficient. There are no prerequisites.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1.	Centrifugation	Introduction: Basic Principle of Sedimentation Types of centrifuges: Ultracentrifuge, Design and their working principle Types of Rotors, Wall-effect	4
2.	Spectroscopy : (i) Absorption Spectroscopy	Simple theory of absorption of light by molecules, Chromophore and terminologies associated with absorption of molecules The Beer-Lambert Law and its deviations Single and double beam spectrophotometers for measuring Visible and Ultraviolet light: Instrumentation and Parameters measured in absorption Spectroscopy	4

	<p>(ii) Fluorescence Spectroscopy</p> <p>(iii) Infrared Spectroscopy</p> <p>(iv) Optical Rotatory Dispersion (ORD) & Circular Dichroism (CD)</p> <p>(v) Nuclear Magnetic Resonance (NMR) Spectroscopy</p> <p>(vi) Mass spectrometry</p>	<p>Factors affecting the absorption properties of a chromophore Empirical rule for the absorption spectra of biological macromolecules Chemical Analysis by absorption spectroscopy using Visible and Ultraviolet light Structural studies of Proteins using absorption of Ultraviolet light Structural studies of DNA using absorption of Ultraviolet light Simple theory of Fluorescence Instrumentation and Technology of Fluorescence Spectroscopy Intrinsic Fluorescence measurements for information about the conformation and binding sites of proteins Extrinsic fluorescence measurements for information about the conformation and binding sites of proteins Infrared Spectroscopy: Basic Principle Instrumentation and Technology of Infrared Spectroscopy Information in Infrared Spectra and Applications of Infrared spectroscopy</p> <p>Theory of Optical Rotatory Dispersion (ORD) & Circular Dichroism (CD) Relative values of ORD and CD measurements, Advantages of CD over ORD Instrumentation for measuring ORD and CD</p> <p>Applications of ORD and CD Nuclear Magnetic Resonance (NMR) Spectroscopy : Principle Basic Instrumentation of NMR Spectrometer Applications of NMR Spectroscopy</p> <p>Mass spectrometry: Basic Principle Instrumentation and main components of mass spectrometers Ionization source, Mass analyzers, and Detectors 4. Applications of Mass Spectrometry</p>	<p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p>
3.	Chromatography	<p>Partition Chromatography: Simple Theory, Concept of theoretical plates Adsorption Chromatography: Simple Theory & Types Operations of columns : Terminologies and concept Elution : Types of elution methods Supports : Concept of mesh size and mesh screen Paper Chromatography : Principle, Experimental Procedure, R_f value calculation, Ascending and Descending paper chromatography, 2-D paper chromatography Thin Layer Chromatography: : Principle, Experimental Procedure, R_f value calculation, Advantages of Thin layer chromatography over paper and column chromatography Gas-Liquid Chromatography: Principle, Basic set up of Gas-liquid chromatography system, Detectors and Uses of Gas-Liquid chromatography</p>	8

		<p>Gel Chromatography (molecular-sieve chromatography): Simple Theory, Materials (dextran, agarose and polyacrylamide gels), Advantages of gel chromatography, Estimation of molecular weight and applications of gel chromatography</p> <p>Ion-Exchange Chromatography: Principle, Properties of Ion Exchangers, Choice of Ion Exchangers, Technique and application of Ion Exchange chromatography.</p> <p>High-Performance of Liquid Chromatography (HPLC): Principle, Application of pressure in HPLC, Advantages and uses of HPLC.</p> <p>Affinity Chromatography: Principle, Methods of Ligand immobilization (Cyanogen-bromide-activated agarose, Aminoethyl- and hydrazide-activated polyacrylamide), uses of affinity chromatography</p>	
4.	Electrophoresis	<p>Electrophoresis : General Principle, Agarose and Polyacrylamide gels</p> <p>Sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE), Principle of separation, Techniques and molecular weight estimation via SDS-PAGE</p> <p>Iso-electric focusing (IEF): Principle, Technique and application</p> <p>2-D PAGE: Steps involved in 2-D PAGE, application in proteomics</p> <p>Pulse-field gel electrophoresis: Principle, Technique and Application</p> <p>Capillary electrophoresis: Principle, Technique and Application</p>	3
5.	X-ray crystallography	<p>Interaction of X-ray with matter: Absorption, Scattering and diffraction (Bragg' s Law)</p> <p>Preparation of crystals : Hanging and sitting drop vapor diffusion methods</p> <p>X-ray diffraction methods</p> <p>Application of X-ray Diffraction in Crystal structure</p>	2
6.	Techniques for Intermolecular Interactions	<p>Surface Plasmon Resonance (SPR) Spectroscopy : Principle, Technique & Application</p> <p>Isothermal Titration Calorimetry (ITC) : Principle, Technique & Application</p>	1
Total Number of Lectures			30

METHODOLOGY:

The course will be covered through lectures supported by Practicals.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS RECOMMENDED:

1. Physical Biochemistry, Applications to Biochemistry and Molecular Biology, D. Freifelder, 2nd edition, W.H. Freeman and Company, New York, 1992.
2. Biophysical Chemistry Principles and Techniques by A. Upadhyay, K. Upadhyay & N. Nath, 4th edition, Himalayan Publishing House. 2005.
3. Instrumental Methods of Chemical Analysis, G. R. Chatwal and A. K. Sham, 5th edition Himalaya Publishing House, 2005.
4. Instrumental Analysis, D. A. Skoog, F. J. Holler, S. R. Crouch, 11th edition, Brooks/Cole, a part of Cengage Learning, 2012.

PRACTICAL IN ANALYTICAL TECHNIQUES (4 Hs. Per Week)**MARKS: 100**

Sr. No.	Name of the experiment	Learning objective	Literature/ Web links for reference and videos
1	Lab orientation, acquaintance with infrastructure and instruments.	Developing competence and encourage hands on usage and maintenance of facilities and equipment's. SOPs and safety practices.	1. Physical Biochemistry, Applications to Biochemistry and Molecular Biology, D. Freifelder, 2 nd edition, W.H. Freeman and Company, New York, 1992. 2. An introduction to practical Biochemistry, 3 rd edition by D. T. Plummer, Tata McGraw-Hill, 2004. 3. Laboratory manual in Biochemistry by J. Jayaraman, New Age International (P) Limited, Publishers, 2011. 4. Introductory Practical Biochemistry by S.K. Sawhney and R. Singh, 2 nd edition, Narosa Publishing House, 1999. 5. Calbiochem buffer booklet
2.	Preparation of various common buffers such as Phosphate buffer saline (PBS), Tris buffer saline (TBS), Tris acetate buffer	To understand the preparation of various common buffers and its use in biological system, To understand the concept of molarity, normality etc., Measurement of pH, To understand, why a particular buffer is preferred for a particular range of pH	
3.	To study and understand the process of dialysis	Knowhow of preparation and usage of dialysis bag. Application of dialysis process, molecular weight cut off and desalting of proteins. REFER:	
4.	Separation of various amino acids using paper chromatography and calculation of retention factor (R_f) value	To understand the principle of partition chromatography, technique of paper chromatography and calculation of R_f value of given unknown amino acids using the standard amino acids.	
5.	Separation of various amino acids using Thin Layer chromatography (TLC) and calculation of Retention factor (R_f) value	To understand the principle of partition chromatography, techniques of thin layer chromatography and calculation of R_f value of given unknown amino acids using the standard amino acids.	
6.	To study the elution profile of given proteins (e.g. BSA, ovalbumin, lysozyme) on Sephadex G-50 / G-100 column	1. To know the preparation of the matrix, column packing, calculation of the bed volume, void volume and flow rate etc. 2. To determine the elution profile of given protein by taking absorbance at 280 nm and to understand the principle of molecular- sieving. 3. Various application, desalting, protein separation etc.	
7.	To study and determine the functioning of high performance liquid chromatography (HPLC)	1. To understand the principle of HPLC and functioning of the various parts of HPLC system. 2. To study the elution profile of the BSA using gel filtration column (on TSK-GEL gel filtration column from Tosoh Bioscience)	

Sr. No.	Name of the experiment	Learning objective	Literature/ Web links for reference and videos
8	Estimation of protein by various methods such as Lowry's and Bradford.	To understand the principle of method, preparation of calibration curve with standard protein and calculation of concentration of unknown protein sample.	
9.	To find out the concentration of given bovine serum albumin (BSA) solution in mg/ml.	1. What is percent extinction coefficient? 2. What is the percent extinction coefficient of BSA and standard proteins? 3. How will you calculate the concentration of given protein solution using percent extinction coefficient in mg/ml?	
10.	To estimate the molecular weight of given protein using Sodium dodecyl sulfate - Polyacrylamide Gel Electrophoresis (SDS-PAGE)	1.To study the principle and technique of SDS-PAGE for the separation of proteins 2. To check the purity of the protein using SDS-PAGE 3. Preparation of the standard curve (using standard protein provided) for estimation molecular weight of protein.	
11.	Centrifugation: Cell pelleting, sub-cellular fractionation of cell extract, handling of various type of centrifuges.	1. To understand the basics of centrifugation. 2. Demonstration of various type rotors, their function and use. 3. Demonstration of functioning of various types of centrifuges.	

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	40
End semester examination:	60
Total:	100

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 301.1	2	-	-	3	3	3	2	2	-	-	3	3	2	1	1
BT 301.2	2	-	-	3	3	-	3	2	-	-	3	3	2	1	1
BT 301.3	2	-	-	3	3	-	3	2	-	-	3	3	2	1	1
BT 301.4	2	-	-	3	2	-	3	2	-	-	3	2	2	1	1
BT 301.5	2	-	-	-	2	-	2	2	-	-	-	2	1	1	1
BT 301.6	1	-	-	-	2	-	3	1	-	-	-	2	1	1	1

COURSE: MICROBIOLOGY AND VIROLOGY**COURSE CODE: BT302****MARKS: 150****L T P H C****2 0 4 6 4****OBJECTIVE :**

The objective of the course is to familiarize the students with microorganisms and viruses, their structures, diseases caused by bacteria and viruses and their control.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT302.1	Operate basic and advanced microscopes to identify and differentiate prokaryotes and eukaryotes based on their structure and characteristics
BT302.2	Demonstrate the processes involved in the replication and survival of bacteria and viruses and their interaction with the environment and hosts
BT302.3	Employ different methods for controlling the growth of microorganisms in physical and biological settings
BT302.4	Evaluate microbial diseases and infections in humans and their pathogenesis
BT302.5	Characterize bacteriophages, plant and animal viruses using basic and advanced methods
BT302.6	Demonstrate the growth and differentiation of fungi and study their industrial applications

PREREQUISITES:

Since the course is very basic in nature, school level knowledge in biology is sufficient to take the course and there are no prerequisites.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1	Introduction to Microbiology	Scope and history of Microbiology. Characterization, classification and identification of microorganism. Microscopic examination (Staining and microscopic techniques)	4
2	Microorganism-Bacteria	Morphology and fine structure of bacteria. Cell wall structure in details. Cultivation of bacteria. Reproduction and growth. Growth kinetics. Isolation and preservation.	5

	The Viruses	Discovery, virus structure, classification, viral replication cycle, detection and enumeration of viruses, virus cultivation in lab, virioids, prions.	4
3	Control of Microorganisms	Control of By physical and chemical agents. Role of antibiotics and chemotherapeutic agents	5
4	Micro –organisms and Human diseases	Multiple drug resistant bacteria and their biofilm lifestyle. Microbial diseases of skin and eye, nervous system, cardiovascular & lymphatic system, respiratory, and digestive system.	4
5	Bacteriophages	Morphology, reproduction of ds DNA phages, ss DNA phages and RNA phages.	2
	Plant Viruses	Nomenclature and classification, viruses infecting fruits and vegetables	2
	Animal Viruses	Viruses containing ss(+) RNA, ss(-) RNA, ds RNA and DNA and ssDNA, RNA tumor viruses requiring DNA intermediate for synthesis.	3
6.	The major group of Eukaryotic micro-organism-Fungi.	Growth and differentiation in fungi, Industrial application of fungal cultures.	1
Total Number of lectures			30

METHODOLOGY:

The course would be taught through lectures, demonstrations and practicals.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS RECOMMENDED:

- 1) Microbiology: An introduction, G.J. Tortora, B.R. Funke, C.L. Case, 5th Edition, Benjamin Pub. Co. NY, 1992.
- 2) Medical Bacteriology, N.C. Dey, and T. K. Dey, Allied Agency, Calcutta, 17th Edition, 1988.
- 3) Text book of microbiology, R. Ananthnarayana, and C.E. Jayaram Panikar, 5th edition, Orient Longman, 1996.
- 4) Fields Virology D. Knipe and P. Howley. Vol.1 and 2- 4th Edition. Lippincott-Raven Publishers, 2006.
- 5) Fundamentals of Molecular Virology, N. H. Acheson 2nd Edition. Wiley Publisher, 2011.

PRACTICAL IN MICROBIOLOGY AND VIROLOGY (4 Hs per week) Marks 100

Sr. No.	Name of the experiment	Learning objective
Introduction to Microscopy		
1	Introduction to Microscopy	a) To study the microscope and to observe different microorganisms like bacteria, protozoa, fungi and yeasts, algae – from natural habitat. b) Demonstration: Students will get familiar with different microscopic techniques such as TEM, SEM, Confocal-Microscopy, Flow cytometry and applications of these microscopic techniques in observation of bacterial biofilms.
Introduction to Microbiology		
2	Introduction to Microbiology Lab instruments	To understand the principle and use of different microbiology lab instruments such as incubator, oven, colorimeter, autoclave, pH meter, water-bath, analytical balance, biosafety cabinet, refrigerator, deep freezer (-80°C), magnetic stirrer, vortex mixer.
3 (a)	Introduction to Microbiology Lab practices- Preparation and autoclaving of different type lab media	<input type="checkbox"/> To become familiar with the necessary nutritional and environmental factors for culturing microorganisms in the laboratory. <input type="checkbox"/> To understand the decontamination or sterilization process using an autoclave. <input type="checkbox"/> To learn the procedures used in preparing media needed for culturing microorganisms.
3 (b)	Preparation of Petri plate and slant. Handling and Examining Cultures	<input type="checkbox"/> To learn the procedure used in preparing plate and slant for culturing microorganisms. <input type="checkbox"/> To make aseptic transfers of pure cultures and to examine them for important gross features.
4	Isolation of bacteria and study bacterial colony characteristics	<input type="checkbox"/> To isolate pure cultures from a specimen containing mixed flora by using streak and spread plate technique. <input type="checkbox"/> To study the different bacterial colony characteristics and to be able to differentiate between the general morphological types of bacteria.

5	Microbial staining techniques- (a) Simple and (b) differential staining	<input type="checkbox"/> To learn the value of simple stains in studying basic microbial morphology <input type="checkbox"/> To learn the Gram-stain technique and to understand its value in the study of bacterial morphology
Control of Microorganisms		
6	Antimicrobial activity (natural and synthetic) testing using - Disc Diffusion Assay, Well diffusion assay.	To learn the agar disk and well diffusion technique for antimicrobial susceptibility testing of different synthetic drugs and plant derived natural compounds against different Gram positive and Gram negative bacteria.
7	MIC and MBC of antibacterial compounds.	To learn MIC and MBC assay for antimicrobial susceptibility testing of different synthetic drugs and natural compounds against different Gram positive and Gram negative bacteria.
8	Biofilm inhibition activity of synthetic antibiotics and plant derived natural compounds by microtitre plate assay.	To learn the anti-biofilm activity of different drugs against different antibiotic resistance biofilm forming Gram positive and Gram negative bacteria by using crystal violate microtitre plate.
9	Oligodynamic action of heavy metals.	To understand a <u>biocidal</u> effect of metals against different microorganisms, especially <u>heavy metals</u> , that occurs even in low concentrations.
10	Growth curve and how curve is disrupted by an antimicrobial agent.	To understand the growth pattern of bacterial cells and the effect of antimicrobial agents on its growth.
11	Personal Hygiene – Effect of soap and disinfectant washing.	To study the activity of some disinfectants and to learn the importance disinfectant in skin cleaning.
Microbial organisms and diseases		
12 (a)	Isolation, identification of pathogens from clinical samples (urine, stool, pus)	To understand the clinical microbiology (Physical, chemical and microscopic examination of clinical samples). Isolation and identification of pathogens such as <i>E. coli</i> , <i>Salmonella</i> spp., <i>Pseudomonas</i> spp., <i>Proteus</i> spp., <i>Klebsiella</i> spp., <i>Shigella</i> spp., <i>Staphylococcus</i> , <i>Streptococcus</i> spp., etc.
12 (b)	Demonstration of permanent slides of parasites	To identify and study parasites such as <i>Entamoeba histolytica</i> , <i>Ascaris</i> spp. <i>Plasmodium</i> spp. and <i>Leishmania</i> spp.
Mycology		
13 (a)	Distinguish between beneficial and harmful fungi and yeast.	To become familiar with essential and disease causing fungi and yeasts.

13 (b)	Isolation and microscopic observation of fungal cultures.	To become familiar with mycological culture techniques. To visualize and identify the structural components of fungi.
14	Enumeration of yeast cells by Neubauer chamber. (Source of yeast – Oral thrush or vaginal thrush).	To determine the concentration of yeast cells in a given sample by Neubauer chamber method.
15	Demonstration of permanent slides – Tissue section with fungal infection.	To become familiar with fungal infection to different human tissue.
Virology		
16	Isolation of bacteriophages by Plaque method	This assay is the most widely used technique for the isolation of virus and its purification, and to optimize the viral titers.
17	Viral infection diagnosis - Cytopathic effect (CPE)	To become familiar with morphological changes in cells caused by viral infections; the responsible virus is said to be cytopathogenic effect.
18	Visit to a viral research institute – such as NARI or NIV, Pune	To become familiar with the research on animal viruses and viral diseases of human Preparation and production of antigens, diagnostic sera, vaccines, nucleic acid probe/s, etc.

References:

- 1) Basic Practical Microbiology: A manual 2006 Society for General Microbiology (SGM), 2006.
- 2) Medical Laboratory Technology by K. L. Mukherjee, Vol III, 10th Edition, Tata Mc. Graw-Hill Pub Co., 1988.
- 3) Antimicrobial Chemotherapy by D. Greenwood, 3rd Edition, Oxford University Press, 1995.
- 4) Laboratory Manual and Workbook in Microbiology Applications to Patient Care by J. A. Morello, P. A. Granato, and H. E. Mizer, 7th Edition, The McGraw Hill Companies, 2003.
- 5) Textbook of Medical Laboratory Technology by P. B. Godkar and D. P. Godkar Vol 1 and 2 Bhalani Publishing, 2005.
- 6) Bergey's Manual of Systematic Bacteriology, Vol 1 and 2 Published by Springer, New York, 2015.

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	40
End semester examination:	60
Total:	100

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
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BT 302.1	-	-	-	2	2	-	3	-	-	-	2	2	3	1	1
BT 302.2	2	2	2	2	3	-	3	2	2	2	2	3	2	2	1
BT 302.3	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2
BT 302.4	2	2	3	2	2	2	3	2	2	3	2	2	3	3	3
BT 302.5	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2
BT 302.6	3	3	2	2	2	3	3	3	3	2	2	2	3	2	2

COURSE: GENETICS**COURSE CODE: BT303****MARKS: 150****L T P H C****3 0 2 5 4****OBJECTIVE :**

The students would understand Mendelian Genetics, its extensions, Non-Mendelian genetics, Sex determination, Genetic diseases, Syndromes, Chromosomal Aberrations, and Population Genetics

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT303.1	Outline the fundamental principles of inheritance
BT303.2	Examine the extension and deviations in Mendelian inheritance patterns
BT303.3	Illustrate different types of Non-Mendelian inheritance
BT303.4	Analyse the chromosomal basis of inheritance, pedigrees, importance of cytogenetics and explain genetic mapping
BT303.5	Discuss the genetic basis of sex determination in different organisms
BT303.6	Demonstrate the principles of inheritance at the population level

PREREQUISITES:

Since the course comes under Basic sciences, school level knowledge of molecular biology and chemistry is required by the students to take up this course.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1	History of Genetics	Historical views of heredity	2
	Mendelian Genetics	<input type="checkbox"/> Mendel's experimental design. <input type="checkbox"/> Mendelian laws and its application <input type="checkbox"/> Punnett Square and forked line method. <input type="checkbox"/> Probability Chi Square method.	7
2	Extension of Mendelian laws	<input type="checkbox"/> Incomplete dominance and co-dominance. <input type="checkbox"/> Multiple alleles. <input type="checkbox"/> Gene Interactions that modifies Mendelian ratios: different type of epistasis, complementation analysis. <input type="checkbox"/> Environmental effect on the expression of genes. <input type="checkbox"/> Penetrance and expressivity, Pleiotropy. <input type="checkbox"/> Position effect and genomic imprinting.	7
3	Non-Mendelian inheritance	<input type="checkbox"/> Rules and examples of Non-Mendelian Inheritance: mitochondrial, chloroplast <input type="checkbox"/> Maternal and uniparental inheritance. <input type="checkbox"/> Infectious heredity <input type="checkbox"/> Contrast to non-Mendelian inheritance o (Maternal Effect)	5
4	Chromosomal basis of inheritance	<input type="checkbox"/> Evidences for chromosome theory of inheritance: Sex chromosomes, Sex linkage and non-disjunction of X chromosomes. <input type="checkbox"/> Analysis of sex-linked and autosomal traits in humans. Mendelian inheritance in Human ; Pedigree analysis	7
	Cytogenetics and linkage mapping	<input type="checkbox"/> Cytogenetic techniques. <input type="checkbox"/> Variations in chromosome structure and number and associated disorders. <input type="checkbox"/> Linkage and crossing over and gene mapping in eukaryotes.	6
5	Sex determination	<input type="checkbox"/> Genotypic (Mammals, Drosophila, C. elegans), genic and environmental mechanisms. <input type="checkbox"/> Mechanisms of dosage compensation in Mammals, Drosophila, C. elegans	6
6	Population genetics	<input type="checkbox"/> Genetic structure of population: genotype and allele frequencies <input type="checkbox"/> The Hardy-Weinberg Law. <input type="checkbox"/> Genetic variation: mutation, migration, natural selection and random genetic drift.	5
Total Number of Lectures			45

METHODOLOGY: The course would be taught through lectures, demonstrations and practical.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	60 minutes	20
II Internal	45 minutes	15
Attendance		5
End Semester Exam	2 hours 30 minutes	60
Total		100

BOOKS RECOMMENDED:

- Russell, P. J. (2006). Genetics A molecular approach, Pearson Benjamin Cummings, San Francisco Boston, New York.**
- Tamarin, R. H. (2002). Principles of Genetics 7th edition, The McGraw Hill Companies USA.**
- Klug, W. S., Cummings, M. R. (1999). Essentials of Genetics. Prentice-Hall Inc. USA.**

PRACTICAL IN GENETICS (2 Hs. Per Week)**MARKS: 50**

Sr. No.	Name of the experiment	Learning objective	Literature/ Web links for reference and videos
1	To study different model organisms (<i>Escherichia coli</i> , <i>Drosophila melanogaster</i> , <i>Caenorhabditis elegans</i> , <i>Mus musculus</i> , <i>Saccharomyces cerevisiae</i> and <i>Arabidopsis thaliana</i>)	To understand the importance of usage of model organisms systems in genetic studies	Genetics, A Conceptual Approach by B. A. Pierce, 5 th edition, W. H. Freeman & Company, 2013. Human Molecular Genetics by A. P. Read and T. Strachan, 4 th edition, Taylor & Francis, 2011.
2	Estimation gene frequency in population / To study distribution of dominant and recessive traits in the population	To understand Mendelian inheritance patterns in Humans	

3	Mutants in <i>Drosophila</i> , monohybrid and dihybrid crosses in <i>Drosophila</i> ,	To understand Mendelian inheritance patterns	
4	Preparation of ideogram of human chromosomes and its analysis	To identify chromosomal anomalies	
5	To study the effect of genetic drift on sample population (Founder effect)	Understanding genetic drift in populations	
6	Sex Linked lethal in <i>Drosophila</i>	To understand sex linked inheritance	
7	To identify auxotroph mutants in bacteria	To understand recombination in Bacteria	

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT303.1	-	1	2	3	2	-	3	-	1	2	3	2	2	1	1
BT303.2	2	3	2	2	2	-	-	2	3	2	2	2	2	1	2
BT303.3	2	2	2	-	2	-	-	2	2	2	-	2	2	1	2
BT303.4	3	3	3	2	2	2	3	3	3	3	2	2	3	2	2
BT303.5	3	3	3	2	2	2	3	3	3	3	2	2	2	1	1
BT303.6	3	3	2	3	2	2	3	3	3	2	3	2	2	1	2

COURSE: CONCEPTS IN BIOINFORMATICS**COURSE CODE: BI301****MARKS: 150****L T P H C**
2 0 4 6 4**OBJECTIVE:**

The objective of the course is to familiarize the student with basic concepts in Bioinformatics

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BI301.1	Outline the scope of bioinformatics and use sequence and structural databases
BI301.2	Identify the data retrieval tools and illustrate respective biological file formats to solve a research problem
BI301.3	Analyse and interpret nucleotide and protein sequences based on biological tools such as BLAST, FASTA, CLUSTAL Omega

BI301.4	Predict structures and apply data from secondary databases to assess various biological questions such as evolutionary relationship, structural and functional annotations
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PREREQUISITES

Students should be familiar with school level mathematics and Biology to take up this course. In case they do not have mathematics at the twelfth level they should have cleared the core mathematics in the first semester.

COURSE DESCRIPTION

Unit	Topics	Detailed syllabus	No. of Lectures
1	Overview of Bioinformatics.	Overview and scope of Bioinformatics, Computers in biology, medicine & different problems in biology.	02
	Introduction to nucleic acid and protein databases.	NCBI, EMBL, DDBJ, UNIPROT, PDB, SCOP, CATH.	05
2	Data acquisition, Database content, structure and annotation.	File formats: GenBank, EMBL, PDB, PIR, ALN Types of database: flat file, relational, hierarchical, network, object-oriented. Annotated sequence databases, Genome and Organism specific databases.	03
	Retrieval of Biological Data.	Data retrieval tools: Entrez, SRS etc.	02
3	Pairwise sequence alignment.	Sequence comparisons & alignment concepts, Global Alignments – Needleman-Wunsch Algorithm Local Alignments – Smith-Waterman Algorithm Introduction to Homology, Analogy, Orthology Paralogy, Xenology.	04
	Multiple sequence alignment.	Methods of multiple sequence alignment, CLUSTALW & MUSCLE Algorithms, Applications of MSA.	03
	Database similarity searches.	FASTA, BLAST, PSI-BLAST algorithms.	02
	Patterns, Motifs, and Profiles.	Derivation and searching, Derived Databases of patterns, motifs and profiles Prosite, Blocks, Prints, Pfam etc.	03
4	Introduction to Phylogenetic analysis.	Methods of phylogenetic analysis, cladistics, Building phylogenetic trees, evolution of macromolecular sequences.	03
	Introduction to structural Bioinformatics.	Levels of protein structure, Analyzing secondary structure, Ramachandran Plot, Protein structure prediction, RNA structure prediction, visualization tools.	03
Total Number of Lectures			30

METHODOLOGY

The course will be covered through lectures and supported by practical.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS RECOMMENDED

1. Ramsden, J. (2023). Bioinformatics: an introduction. Springer Nature.
2. Rastogi, S. C., Rastogi, P., & MENDIRATTA, N. (2022). Bioinformatics: Methods and Applications-Genomics, Proteomics and Drug Discovery. PHI Learning Pvt. Ltd.
3. Bioinformatics: Sequence and genome analysis by D. W. Mount, 2nd edition, CBS Publication, 2005.
4. Bioinformatics: Tools & Applications by D. Edward, J. Stajich and D. Hansen, Springer, 2009.
5. Bioinformatics: Databases, Tools & Algorithms by O. Bosu and S. K. Thurkral, Oxford University Press, 2007.
6. Bioinformatics: Methods and Applications - Genomics, Proteomics and Drug Discovery by S.C. Rastogi, N. Mendiratta, P. Rastogi, PHI Learning Pvt. Ltd., 2015.

PRACTICAL IN BIOINFORMATICS

(4 Hs. Per Week)

MARKS: 100

Sr. No.	Name of the experiment	Learning objective	Literature/ Weblinks for reference and videos
1.	Introduction to Nucleic Acid and Protein Sequence Data Banks.	Explore and Search Nucleic acid Sequence Database NCBI, EMBL, DDBJ.	www.ncbi.nlm.nih.gov/genbank/ https://www.ebi.ac.uk/embl/ www.ddbj.nig.ac.jp/
2.	Introduction to Protein Sequence Data Banks.	Explore and Search and use analysis tools at Protein Sequence Database: UNIPROT	http://web.expasy.org/docs/swiss-prot_guideline.html http://pir.georgetown.edu/
3.	Database Similarity Searches.	•BLAST •FASTA	https://blast.ncbi.nlm.nih.gov/ https://www.ebi.ac.uk/Tools/sss/fast a/
4.	Database Similarity Searches.	PSI-BLAST, PHI-BLAST algorithms	https://blast.ncbi.nlm.nih.gov/
5.	Multiple sequence alignments.	Clustering algorithm CLUSTALW, Tree View, MUSCLE	www.genome.jp/tools/clustalw/
6.	Patterns, motifs and Profiles in sequences.	Study Derived Databases: PROSITE, BLOCKS, Prints Pfam etc.	https://prosite.expasy.org/prosite_link.html https://www.ncbi.nlm.nih.gov/pmc/articles/PMC102408/
7.	Genome Databases.	Ensemble, TIGR, Flymine	http://plantta.jcvi.org/ www.flymine.org/
8.	Protein Structure Databases.	PDB, SCOP, CATH	http://www.rcsb.org/pdb/home/home.do scop.mrc-lmb.cam.ac.uk/scop/
9.	Structure Visualization and Manipulation	Structure Visualization Tools: Pymol, RASMOL	https://pymol.org/
10.	Data Structure Algorithms	Data Structure Algorithms for gene, protein sequence analysis.	https://www.perl.org/

BOOK RECOMMENDATION:

Bioinformatics: A practical guide to Analysis of Genes & Proteins by A. D. Baxevanis and B. F. Francis Ouellette, 3rd edition, John Willey and sons, 2005

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	40
End semester examination:	60
Total:	100

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BI 301.1	3	3	3	-	3	3	-	-	2	2	-	3	1	1	-
BI 301.2	3	3	3	-	3	3	-	-	2	2	-		1	1	-
BI 301.3	3	3	3	3	3	3	-	-	2	2	1	2	3	2	2
BI 301.4	3	3	3	3	3	3	2	2	3	3	2	2	3	2	2

COURSE: BIOSAFETY, BIOETHICS AND INTELLECTUAL PROPERTY RIGHTS**COURSE CODE: BT304****L T P H C****MARKS: 50****2 0 0 2 2****OBJECTIVES:**

The objective of the course is to make students learn about the legal, safety and public policy issues raised due to the rapid progress in Biotechnology and development of new products. The biotechnology students supposed to understand and follow the regulatory framework important for the product safety and benefit for the society. The students are given case history to discuss and express their views.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT304.1	Practice biological risk assessment in a laboratory and implement measures of protection through various levels of biosafety practices
BT304.2	Outline various national and international guidelines related to biosafety and its implementation in biotechnology
BT304.3	Comply with bioethical practices in biotechnological research
BT304.4	Categorize intellectual property into patents, copyrights, Trademarks, Industrial designs, Trade secrets and Geographical Indications

PREREQUISITES:

This is an advance level course. Students must have an understanding of introductory undergraduate level course such as chemistry, biology, microbiology.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1	Biosafety	Introduction and Development of Biosafety Practices and Principles General lab requirements Definitions and Biosafety levels: 1,2,3,4 & Summary Biological safety cabinets: centrifuges, Shipment of biological specimens, Biological waste management, Decontamination, Biosafety manuals, Medical surveillance, Emergency response Risks and Assessment of Risks Biosafety at small scale and large-scale processes Biosafety for genetically engineered microbes, plants and animals	9
2	Safety Guidelines	National biosafety committees Biosafety and environment protection International conventions	3

3	Bioethics	History and Introduction Ethics and genetic engineering Genetic Privacy Patent of genes Human races, Trading Human Life, Human Cloning Stem Cells, Eugenics, Christian faith, Human genome and religious considerations Case Studies and Final Considerations	6
4	Intellectual Property Rights	Introduction and Types of Intellectual Property Rights Patents Copyrights, Trademarks, Industrial designs, Trade secrets, Geographical Indications and Farmers rights & Plant variety Protection. IPR for Biotechnology, Patenting of transgenic organisms and isolated genes, microbes etc International conventions and cooperation Current status of IPR in India	12
Total Number of Lectures			30

METHODOLOGY

The course will be covered through lectures. The students will be given problems and case histories to discuss and clear their problems. The students will be evaluated based on two class tests, lecture and lab attendance, class participation, write up and quizzes.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS RECOMMENDED:

1. Understanding Biotechnology by A. Borem, D. E. Bowen and F. R. Santos, 1st edition, Pearson Education Inc., 2003.
2. Biotechnology an Introduction by S. R. Barnum, Brooks/Cole; International Edition 2004
3. Biosafety and Bioethics by R. Joshi, Isha Books, Delhi, 2006.
4. Introduction to Bioethics by J. A. Bryant and L. B. la Velle Bryant, 1st edition, Wiley Blackwell Publishing, 2005.
5. Intellectual Property Rights by C.B. Raju, 1st edition, Serials Publications, 2007.
6. Law Relating to Intellectual Property by B. L. Wadehra, Universal Law Publishing CO., Fourth Edition, 2007.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 304.1	1	2	2	1	3	3	3	1	1	2	3	2	2	-	3
BT 304.2	1	2	3	2	2	2	3	1	1	2	3	2	2	-	3
BT 304.3	1	2	2	1	1	2	3	3	2	3	2	2	2	1	3
BT 304.4	1	2	2	2	2	2	2	1	2	3	3	1	2	1	3

COURSE: UNIVERSAL HUMAN VALUES 2: UNDERSTANDING HARMONY**COURSE CODE: HU301****MARKS: 100****L T P H C****2 1 0 3 3**

HUMAN VALUES COURSES: During the Induction Program, students would get an initial exposure to human values through Universal Human Values – I. This exposure is to be augmented by this compulsory full semester foundation course.

OBJECTIVE: The objective of the course is four fold:

1. Development of a holistic perspective based on self- exploration about themselves (human being), family, society and nature/existence.
2. Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence
3. Strengthening of self-reflection.
4. Development of commitment and courage to act.

COURSE OUTCOME

CO No.	At the end of the course, the learner should be able to:
HU301.1	Develop a holistic perspective based on self- exploration about themselves (human being), family, society, nature and existence
HU301.2	Acquire harmony in the self, family, society and nature
HU301.3	Strengthen self-reflection and develop commitment and courage to act responsibly
HU301.4	Utilize the professional competence for augmenting universal human values

PRE-REQUISITES: None. Universal Human Values 1 (Desirable)

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1	Introduction	Purpose and motivation for the course, recapitulation from Universal Human Values-I. 2. Self-Exploration–what is it? - Its content and process; ‘Natural Acceptance’ and Experiential Validation- as the process for self-exploration. 3. Continuous Happiness and Prosperity- A look at basic Human Aspirations 4. Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment of aspirations of every human being with their correct priority. 5. Understanding Happiness and Prosperity correctly- A critical	2

		appraisal of the current scenario 6. Method to fulfil the above human aspirations: understanding and living in harmony at various levels	
	Understanding Harmony in the Human Being - Harmony in Myself!	Understanding human being as a co-existence of the sentient 'I' and the material 'Body'. 2. Understanding the needs of Self ('I') and 'Body' - happiness and physical facility. 3. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer). 4. Understanding the characteristics and activities of 'I' and harmony in 'I'. 5. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail. 6. Programs to ensure Sanyam and Health.	6
2	Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship	Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship 2. Understanding the meaning of Trust; Difference between intention and competence 3. Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship 4. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals 5. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.	6
3	Understanding Harmony in the Nature and Existence - Whole existence as Coexistence	1. Understanding the harmony in the Nature 2. Interconnectedness and mutual fulfilment among the four orders of nature- recyclability and self-regulation in nature. 3. Understanding Existence as Co-existence of mutually interacting Unit in all-pervasive space. 4. Holistic perception of harmony at all levels of existence.	7

4	Implications of the above Holistic Understanding of Harmony on Professional Ethics	1. Natural acceptance of human values 2. Definitiveness of Ethical Human Conduct 3. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order 4. Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems. 5. Case studies of typical holistic technologies, management models and production systems 6. Strategy for transition from the present state to Universal Human Order: a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers b) At the level of society: as mutually enriching institutions and organizations	7
Total Number of Lectures			30

TUTORIAL SESSIONS

Unit	Detail Syllabus	No. of Lectures
1	Practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking	2
	Practice sessions to discuss the role others have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.	3
2	Practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives.	3
3	Practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.	3
4	Practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions e.g. to discuss the conduct as an engineer or scientist etc	3

	Total	14

BOOKS RECOMMENDED:

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010
2. Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
3. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
4. The Story of Stuff (Book).
5. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi.
6. Small is Beautiful - E. F Schumacher.
7. Slow is Beautiful - Cecile Andrews
8. Economy of Permanence - J C Kumarappa
9. Bharat Mein Angreji Raj - PanditSunderlal
10. Rediscovering India - by Dharampal
11. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
12. India Wins Freedom - Maulana Abdul Kalam Azad
13. Vivekananda - Romain Rolland (English)
14. Gandhi - Romain Rolland (English)

MODE OF CONDUCT (L-T-P-C 2-1-0-3 or 2L:1T:0P 3 credits): Lectures hours are to be used for interactive discussion, placing the proposals about the topics at hand and motivating students to reflect, explore and verify them.

Tutorial hours are to be used for practice sessions.

While analysing and discussing the topic, the faculty mentor's role is in pointing to essential elements to help in sorting them out from the surface elements. In other words, help the students explore the important or critical elements.

In the discussions, particularly during practice sessions (tutorials), the mentor encourages the student to connect with one's own self and do self- observation, self-reflection and self-exploration.

Scenarios may be used to initiate discussion. The student is encouraged to take up "ordinary" situations rather than "extra-ordinary" situations.

Such observations and their analyses are shared and discussed with other students and faculty mentor, in a group sitting.

Tutorials (experiments or practical) are important for the course. The difference is that the laboratory is everyday life, and practical are how you behave and work in real life. Depending on the nature of topics, worksheets, home assignment and/or activity are included. The practice sessions (tutorials) would also provide support to a student in performing actions commensurate to his/her beliefs. It is intended that this would lead to development of commitment, namely behaving and working based on basic human values.

It is recommended that this content be placed before the student as it is, in the form of a basic foundation course, without including anything else or excluding any part of this content. Additional content may be offered in separate, higher courses.

This course is to be taught by faculty from every teaching department, including HSS faculty.

Teacher preparation with a minimum exposure to at least one 8- day FDP on Universal Human Values is deemed essential.

ASSESSMENT:

This is a compulsory credit course. The assessment is to provide a fair state of development of the student, so participation in classroom discussions, self-assessment, peer assessment etc. will be used in evaluation.

Example:

Assessment by faculty mentor: 10 marks

Self-assessment: 10 marks

Assessment by peers: 10 marks

Socially relevant project/Group Activities/Assignments: 20 marks

Semester End Examination: 50 marks

The overall pass percentage is 40%. In case the student fails, he/she must repeat the course.

This is only an introductory foundational input. It would be desirable to follow it up by

- faculty-student or mentor-mentee programs throughout their time with the institution
- Higher level courses on human values in every aspect of living. E.g. as a professional

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
HU 301.1	-	-	-	-	-	2	3	3	3	3	-	2	-	-	1
HU 301.2	-	-	-	-	-	2	3	3	3	3	-	2	-	-	1
HU 301.3	-	-	-	-	-	3	2	3	3	2	-	2	-	-	1
HU 301.4	-	-	-	-	-	2	-	3	3	2	-	3	-	-	1

COURSE: NPTEL/SWAYAM/MOOC online course**COURSE CODE: BTSEC301****MARKS: 50****L T P H C****2 0 0 2 2****OBJECTIVE**

Enhancement of student's skill by giving them the opportunity to gain insight on a topic of interest which is not a part of the syllabus.

DESCRIPTION:

The list of courses offered on the MOOCs platform during the third semester are provided to the students. The list includes core program specific courses, soft skill development courses and other additional skill development courses, the duration of which is 8 weeks. The students choose any one of the course which interests them the most. At the end of the semester the students need to earn a certificate on the basis of which they will be given credits out of two.

COURSE: APTITUDE BUILDING-III**COURSE CODE: BTAEC301****L T P H C****MARKS: 50****0 0 2 2 1****OBJECTIVE**

1. To enhance the logical reasoning skills of the students and help them improve the problem-solving abilities
2. To acquire skills required to solve quantitative aptitude problems
3. To boost the verbal ability of the students for academic and professional purposes

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BTAEC301.1	Exhibit sound knowledge to solve problems of Quantitative Aptitude
BTAEC301.2	Demonstrate ability to solve problems of Logical Reasoning
BTAEC301.3	Display the ability to tackle questions of Verbal Ability
BTAEC301.4	Develop technical skills

PREREQUISITE:

Students should be familiar with basic scientific concepts to take up this course.

COURSE DESCRIPTION

Sr no.	Practical/Training/Tests/Interviews	Contact Hours
1	Data arrangements and Blood relations	04
2	Ratio and Proportion	04
3	Percentages, Simple and Compound Interest	04
4	Number System	04
5	Essential grammar for placements	02
6	Electromagnetic Spectrum, Fluorescence and Bioluminescence	02
7	Instrumentation of Microscope	02
8	Morphometry	01
9	Data representation	02

10	Competitive Examination Preparation	02
11	Mock Interviews	01
12	Discussion session-Industry Experts/Academia Experts/Alumni	02
	TOTAL	30

METHODOLOGY

The course will be covered through Lectures/Assignments/Practical/Training/Tests/Interviews

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Continuous Internal Assessment		20
Attendance		
Assignments/Practical/Training/Tests/Interviews		30
Total		50

BOOKS RECOMMENDED:

1. R. S. Aggarwal, (2017). Quantitative Aptitude for Competitive Examinations, 3rd (Ed.). New Delhi: S. Chand Publishing
2. ETHNUS, (2016). Aptimithra, 1st (Ed.). Bangalore: McGraw-Hill Education Pvt. Ltd.
3. Arun Sharma, (2016). Quantitative Aptitude, 7th (Ed.). Noida: McGraw Hill Education Pvt. Ltd.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BTAEC301.1	-	2	2	-	2	-	-	-	-	-	-	2	2	-	-
BTAEC301.2	1	1	1	-	-	-	-	-	-	-	-	-	1	-	-
BTAEC301.3	1	1	1	-	2	-	-	-	-	2	-	-	1	-	-
BTAEC301.4	1	1	1	-	1	-	-	-	-	-	-	-	1	-	-

SEMESTER IV						
Course Code	Course Name	L	T	P	H	Cr
BT401	Molecular Biology	3	0	4	7	5
BT402	Stem cells & Animal Tissue culture	2	0	2	4	3
BT403	Plant Biotechnology	3	0	4	7	5
BT404	Immunology	3	0	2	5	4
BT405	Developmental Biology	2	0	2	4	3
BTIKS401	Indian Regional Biodiversity (Includes field trips and expeditions)	0	1	0	1	1
BTAEC401	Aptitude Building-IV (includes Competitive exam preparation, placement related sessions and alumni interactions and trainings)	0	0	2	2	1
BTOP401 Non-credit mandatory course	Social outreach program/ Science for Society	0	1	0	1	0
Total		13	2	16	31	22

COURSE: MOLECULAR BIOLOGY**COURSE CODE: BT401****MARKS: 200****L T P H C****3 0 4 7 5****OBJECTIVE :**

The objective of the course is to familiarize the students with the basic concept in molecular biology.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT401.1	Outline the concept of molecular biology and genome organization
BT401.2	Illustrate the mechanism of DNA damage and repair, and recombination
BT401.3	Explain and analyse the mechanism of DNA replication
BT401.4	Summarize the mechanism of RNA transcription and its regulation with detailed understanding of post transcriptional processing
BT401.5	Apply the knowledge of protein translation and posttranslational modification for understanding cellular functions
BT401.6	Discuss the regulation of gene expression in prokaryotes and eukaryotes

PREREQUISITES:

Since the course is advance in nature, student must know about biochemistry of nucleic acids, chromosomes and gene structure. Student must have background with Genetics.

COURSE DESCRIPTION:

Unit	Topic	Detail Syllabus	No. of Lectures
1	Introduction:	Concept of genes, Central dogma of Molecular Biology DNA as the genetic material Structure of DNA and RNA	2
	Genome and its organization:	<ul style="list-style-type: none"> • Genome, cot analysis, C value paradox, • Repetitive DNA, Satellite DNA, Gene families and gene clusters 	3

		<ul style="list-style-type: none"> • Nuclear and organelle genome 	
	Chromatin and Chromosome organization:	<ul style="list-style-type: none"> • Nucleosome structure, Higher order chromatin structure • Chromosome structure in prokaryotes & eukaryotes 	3
2	DNA damage DNA Repair Recombination:	<ul style="list-style-type: none"> • Types of mutations. Replication errors and their repairs. • DNA damage • DNA repair – Single step and multistep • Models of homologous recombination in eukaryotes and prokaryotes • Non homologous and end joining (NHEJ) recombination • Genetic consequences of mechanism of recombination. • Site specific recombination and transposition of DNA: conservative site specific recombination, biological roles of sites recombination • Gene conversion. 	10
3	Replication of DNA	<ul style="list-style-type: none"> • Models of DNA replication • Replication fork, continuous and discontinuous DNA synthesis. • Enzymes and proteins in replication • Replication of DNA and different models of replication • Telomeres. Inhibitors of DNA replication. 	5
4	Transcription and mRNA processing, maturation	<ul style="list-style-type: none"> • Components of transcriptional machinery in prokaryotes and eukaryotes: Promoters and Enhancer sequences and transcription Unit • RNA polymerases - <i>E. coli</i> and eukaryotic RNA polymerases. • Transcription process: Chromatin remodeling, Initiation, elongation and termination of RNA synthesis. • Monocistronic and polycistronic RNAs • Posttranscriptional modifications/processing of eukaryotic RNA: • Capping and poly-adenylation, RNA splicing and splicing mechanisms. RNA editing • Inhibitors of transcription 	8
5	Translation and post translational modifications:	<ul style="list-style-type: none"> • General features of genetic code • tRNA & aminoacyl tRNA synthetases, Ribosomes • Translation process- Initiation, Elongation & termination of translation in prokaryotes and eukaryotes, Translational factors • Inhibitors of protein synthesis – antibiotics and other inhibitors. • Post-translational modifications: Covalent and enzymatic modification of proteins • Protein folding, Proteolysis 	8

6	Regulation of gene expression:	<ul style="list-style-type: none"> Regulation of gene expression in prokaryotes: The operon model- lac, trp operons. Transcriptional control by attenuation in trp operon. Regulation of gene expression in eukaryotes Regulatory proteins (Transcription factors)- DNA-binding motif of regulatory proteins. Role of zinc fingers, leucine zippers, helix-turn-helix. 	5
	Molecular evolution:	<ul style="list-style-type: none"> DNA based phylogenetic trees and their applications. 	1
Total Number of Lectures			45

METHODOLOGY

The course would be taught through lectures lectures supported by tutorials and assignments.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	60 minutes	20
II Internal	45 minutes	15
Attendance		5
End Semester Exam	2 hours 30 minutes	60
Total		100

BOOKS RECOMMENDED:

1. Instant notes in Molecular Biology by Turner, Viva Publication, 1997.
2. Microbial Genetics by D. Freifelder, Jones & Bartlett, 2004.
3. Molecular Biology by D. Freifelder, Jones & Bartlett, 2008.
4. Molecular Biology of Gene Watson, by Baker et.al. 7th Edition, Pearsons Publication, 2013.
5. Molecular Biology of the Cell by B. Alberts, Talor & Francis, 2008.
6. Genes by Lewin and Benjamin, Editions IX, Jones & Bartlett, 2010

PRACTICAL IN MOLECULAR BIOLOGY (4 Hs. Per Week) MARKS 100

Sr no.	Name of the experiment	Learning objective	Literature/ Weblinks for reference and videos
1	Preparation of glassware, plasticware, reagents and stock solutions for molecular biology	Special preparations for carrying out molecular biology experiments	Molecular cloning by J. Sambrook, F. Edward and T. Maniatis, 2nd edition, New York: Cold spring harbor laboratory press, 2012.
2	To isolate DNA from a) bacteria b) animal tissues/cells c) plant material using appropriate methods	To understand the critical requirement of specific methods depending on source of DNA	
3	Quantification of DNA by UV absorption and analysis by agarose gel electrophoresis	To understand the quality, and quantity of DNA present per cell	
4	To isolate plasmid DNA from bacteria, restriction analysis and agarose gel electrophoresis	To distinguish between plasmid and genomic DNA in terms of size and migration properties in gel	
5	To isolate RNA from eukaryotic cells and analyse by denaturing formaldehyde agarose gel electrophoresis	To understand various types of RNA/RNA profile and quality of RNA preparation	

6	To find the Melting temperature of DNA	Measure temperature and estimate T_m from your data	
7	Isolation of nuclei, calcium activation of endonuclease resulting DNA ladder including the mononucleosome formation	Hands-on verification of the concept of chromatin structure	
8	Extraction of histone from nuclei and analysis by SDS-PAGE	Understanding the contribution of histones in the formation of chromatin	

PRACTICAL EVALUATION SCHEME

Examination

Internal (Continuous) assessment:

End semester examination:

Total:

Marks

40

60

100

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 401.1	3	2	1	1	1	-	1	1	-	1	-	3	2	1	1
BT 401.2	3	3	3	3	3	1	1	1	1	1	-	3	2	1	1
BT 401.3	3	3	3	3	3	1	1	1	1	2	-	3	2	1	1
BT 401.4	3	3	3	3	3	1	1	2	1	1	-	3	2	1	1
BT 401.5	3	3	3	3	3	1	1	2	2	1	-	3	3	3	2
BT 401.6	3	3	3	3	3	1	1	2	1	1	-	3	3	3	2

COURSE: STEM CELLS AND ANIMAL TISSUE CULTURE**COURSE CODE: BT402****MARKS: 100****L T P H C****2 0 2 4 3****OBJECTIVE :**

Complete understanding of the science of Animal Tissue Culture and stem cells, with emphasis on Mammalian Cells.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT402.1	Outline the basics of animal tissue culture and its types, and methods of cell line development and preservation
BT402.2	Determine the characteristics of different cell lines and their applications
BT402.3	Apply the knowledge of cell culture and tissue engineering for industrial production of therapeutic molecules
BT402.4	Summarize the role of stem cells in tissue architecture development and cloning and comply with ethical issues

PREREQUISITES:

Students should have undertaken a course in Cell Biology before taking this course on Stem cells and Animal Tissue Culture. Students should be aware of good laboratory practices.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1	Introduction:	History,	2
		Cell culture techniques,	
		Equipment and sterilization methodology.	
	Introduction to animal cell cultures:	Nutritional and physiological: Growth factors and growth Parameters	4
		General metabolism and Growth Kinetics	
	Primary cell cultures	Establishment and maintenance of primary cell cultures of adherent and non-adherent cell lines with examples.	3
	Secondary cell cultures	Establishment and maintenance of secondary and continuous cell cultures	2
	2	Characterization of cell lines	Karyotyping, biochemical and genetic characterization of cell lines, Identification of cells, adventitious agents
Application of cell cultures		Vaccine production, e.g. Measles, Rabies	2
		Use of Hybridoma for production of monoclonal antibodies.	
3	Bioreactors in animal cells	Therapeutic biological products, cytokines etc	
		Bioreactors for large-scale culture of animal cells	2
	Tissue engineering	Principle and theory of tissue engineering	3
	Cryopreservation and tissue culture applications	Applications of tissue engineering	
4	Stem Cells Introduction		1
	Stem Cells from Early Mammalian Embryos Adult stem cells, Mesenchymal stem cells		4
	Embryonic Stem cells		2
	Stem Cells to Functional Tissue Architecture		2
	Stem Cells and Cloning		3
	Future for stem cell		1

	research Ethics		
	Total		34

METHODOLOGY

The course would be taught through lectures, demonstrations and LCD powerpoint presentation

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS RECOMMENDED:

- 1) Culture of Animal Cells – A manual of basic technique and specialized applications by R. I. Freshney, 6th edition, Wiley-Blackwell, 2010.
- 2) Animal Cell Technology: From Biopharmaceuticals to Gene Therapy. L. R. Castilho et. al. Taylor & Francis Group, 2008.
- 3) Animal Biotechnology, by A. Akbarsha et. al., 1st edition, Pearson Education 2012.
- 4) Basic Cell Culture by J. M. Davis, 2nd Edition, Oxford University Press, 2002.
- 5) Stem cell handbook, by Stewart Sell, Humana Press. Inc. 2004.

PRACTICAL IN STEM CELLS AND ANIMAL TISSUE CULTURE (2 Hs. Per Week) MARKS 50

Sr. No.	Name of the experiment	Learning objective	Literature/ Weblinks for reference
1	Laboratory set-up and Equipment used in ATC	To understand the functions of ATC Laboratory and use of equipment in ATC	Culture of Animal Cells – A manual of basic technique and specialized applications by R. Ian Freshney, 6 th edition, Wiley-Blackwell 2010 Development of 3D Alginate Encapsulation for Better Chondrogenic Differentiation Potential than the 2D Pellet System, T. Debnath et. al., J Stem Cell Res Ther 5:276. 2015 Apoptosis mediated cytotoxicity induced by isodeoxyelephantopin on nasopharyngeal carcinoma cells, A.K. Farha et. al., Asian J Pharm
2	Preparation of Ca ⁺⁺ -Mg ⁺⁺ -free phosphate buffered saline	The uses and method of preparation of PBS	
3	Preparation of cell culture medium	Composition and preparation of cell culture medium	
4	The practice of aseptic technique	Importance and practical knowledge of aseptic technique in ATC	
5	Subculturing of adherent cell line, with counting & viability staining of cells	Procedure, principle and nuances of passaging adherent cells, use of hemocytometer, Trypan Blue staining	

6	Cryopreservation and thawing of cells	Principle, procedure and critical steps in freezing and thawing cells	Clin Res, Vol 6, Suppl 2, 51-56, 2013.
7	Isolation of peripheral blood mononuclear cells	Method of density gradient centrifugation for PBMC isolation	
8	Isolation and culture of primary cells.	Technique and importance of primary cell culture	
9	Encapsulation of cells in alginate beads and MTT staining	Use and method for preparation of cell-laden alginate beads	
10	Cytotoxicity testing using cultured cells	Application of cultured cells for cytotoxicity testing	

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 402.1	3	3	3	-	-	3	3	1	3	3	-	3	3	3	1
BT 402.2	3	3	3	-	3	2	-	-	2	2	-	3	3	3	3
BT 402.3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3
BT 402.4	3	3	3	3	3	3	3	1	2	1	2	3	3	3	3

COURSE: PLANT BIOTECHNOLOGY**COURSE CODE: BT403****MARKS: 200**
L T P H C
3 0 4 7 5
OBJECTIVE :

The objective of the course is to familiarize the students with basic concepts and advanced research areas in plant biotechnology.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT403.1	Understand the fundamentals of plant biotechnology and plant development
BT403.2	Apply and evaluate the effect of plant growth regulators
BT403.3	Establish and maintain various <i>in vitro</i> plant cell cultures
BT403.4	Demonstrate plant micropropagation techniques and their applications
BT403.5	Illustrate various plant transformation methods
BT403.6	Explain plant secondary metabolites and their <i>in vitro</i> production

PREREQUISITES

Since the course is advance in nature, student must know about sterilization techniques and basic knowledge of plant sciences and molecular biology.

COURSE DESCRIPTION

Sr. No	Topic	Detail Syllabus	No. of Lectures
1	Introduction	Introduction to Plant Biotechnology	1
	Plant development	Embryo development, meristem development, differentiation and organ formation	3
2	Growth Hormones	Auxins, Cytokinins, Gibberellins, ABA and Ethylene as regulators of plant development	3
3	Plant Tissue culture Techniques	Totipotency, differentiation, redifferentiation, Techniques- explants, nutrient media, aseptic manipulations, incubation Callus culture, Suspension culture	6
4	Micropropagation	Pre-existing meristems	2
		Direct and indirect Organogenesis	2
		Somatic embryogenesis	2
		Different stages of micropropagation & Applications	4

		Germplasm conservation	2
5	Plant genetic engineering	Agrobacterium as a natural genetic engineer Agrobacterium based vectors (selectable and screenable markers) Transformation methods a) Agrobacterium b) Direct gene transfer Selective analysis of transgenics Applications	2 2 3 2 1
6	Plant Natural Products	Secondary Metabolites, Types, Pathways In vitro production of secondary metabolites Hairy root culture Elicitors & biotransformation Bioreactors.	2 4 2 2 2
Total Number of lectures			45

METHODOLOGY:

The course would be taught through lectures, demonstrations and practicals.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	60 minutes	20
II Internal	45 minutes	15
Attendance		5
End Semester Exam	2 hours 30 minutes	60
Total		100

BOOKS RECOMMENDED:

1. Plant tissue Culture : Theory and Practice by S.S. Bhojwani and M.K. Razdan, Elsevier, Amsterdam, 1996.
2. An Introduction to Plant Biotechnology by H. C. Chawla, Oxford and IBH, 2002.
3. Gene Transfer to Plants by I.Potrykus and G. Spangenberg, Springer Lab Manual, Springer Verlag, 1997
4. Plant Biotechnology: New Products and Applications by J. Hammond, P. McGarvey, V. Yusibov, Springer Verlag, 1999.
5. Plant Biotechnology: The Genetic Manipulation of Plants by A. Slater, N. Scott and M. Fowler, Oxford University Press Inc. (2008)
6. Plant Physiology by Lincoln Taiz and Eduardo Zeiger. Panima Publishing Corporation, 2003
7. Plant Physiology by L. Taitz , 3rd edition & 5th edition, Sinauer Associates Inc., Publishers Sunderland, Massachusetts U.S.A. 2002 & 2014.

PRACTICALS IN PLANT BIOTECHNOLOGY (4 Hs. Per Week)**MARKS 100**

Sr. No	Name of the experiment	Learning objective	Literature/ Weblinks for reference
1	Aseptic culture techniques for establishment and maintenance of <i>in vitro</i> cultures	To learn the aseptic manipulation techniques for successful plant tissue culture experiments.	1) Plant Tissue Culture, K. K. Dey, New Central Book Agency, 2007
2	Preparation of stock solutions of MS basal medium and plant growth regulators	To understand need of stock solution for media and growth regulators stock preparation and calculation of the same.	2) Plant tissue Culture: Theory and Practice by S.S. Bhojwani and M.K. Razdan, Elsevier, Amsterdam, 1996.
3	Preparation of Nutrient media	Preparation of PTC media using media and growth regulators stock solutions	
4	Callus culture by using Carrot explant/ Leaf explants and somatic embryogenesis	To understand procedure of surface sterilization of explant and perform callus culture and embryogenesis	3) Plant Biotechnology and its applications in Plant tissue culture by A. Kumar and S. Roy, I. K. International Publishing House, 2006.
5	Establishment of suspension culture by using callus/ isolated cells	Understand procedure and importance of suspension culture	
6	<i>In vitro</i> embryo culture	To learn embryo rescue through <i>in vitro</i> method	
7	Micropropagation by using axillary bud /apical meristem	To study micropropagation for regeneration of plants for various fields.	4) Molecular cloning: a laboratory manual. J. Sambrook, D.W.Russell, 3 rd edition, New York: Cold Spring Harbor Laboratory, II, P 125 – 127, 2012.
8	Isolation and purification of active compounds from plants by column chromatography technique	Isolation and identification of plant secondary metabolites	
9	<i>Agrobacterium tumefaciens</i> -mediated plant transformation	To understand importance and process for <i>Agrobacterium</i> mediated plant transformation	

10	GUS staining of transformed plants	To learn the technique to identify the transformants.	
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PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	40
End semester examination:	60
Total:	100

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 403.1	3	3	1	2	1	1	1	1	1	2	1	3	3	3	2
BT 403.2	3	2	2	2	2	1	2	2	2	2	1	3	2	2	2
BT 403.3	3	2	2	2	3	2	3	1	3	2	2	3	2	3	3
BT 403.4	3	3	2	2	2	1	2	1	3	2	2	3	2	3	3
BT 403.5	3	3	2	2	3	1	3	1	3	3	2	3	2	3	3
BT 403.6	3	2	3	2	3	1	2	1	2	2	2	3	2	1	1

COURSE: IMMUNOLOGY**COURSE CODE: BT404****MARKS: 150****L T P H C****3 0 2 5 4****OBJECTIVE :**

The objective of the course is to familiarize the students with the immune system and its function and the advances in the immunology.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT404.1	Develop the basic understanding of immunology, mediators of immunity, and organs of the immune system
BT404.2	Explain various components involved in humoral and cell mediated immune responses
BT404.3	Explain the structure and functions of various immunoglobulins
BT404.4	Apply various techniques for determining antigen-antibody interactions
BT404.5	Outline the organization and inheritance of MHC and their role in antigen presentation
BT404.6	Apply the basic and advanced knowledge of immunology in understanding health and diseases, and to develop treatment measures

PREREQUISITES:

Student should have background of cell biology. They should know basic concept of molecular biology also to understand expression of immunoglobulin gene. They should know some basic assays.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1.	Introduction to Immune System (i) The Cells and soluble mediators of the Immune system	1. Historical Perspective: Early vaccination studies, Early studies of Humoral and Cellular Immunity, Theoretical Challenges, Infection and Immunity (in brief) 2. The Cells and soluble mediators of the Immune system (i) Cells of the immune system : Phagocytes, B cells & T cells, Cytotoxic cells, and Auxillary cells	8

	(ii) Organs of the Immune system	<p>(ii) Soluble mediators of immunity : Acute phase proteins, Complement proteins & Cytokines</p> <p>3. Immune response to pathogens : Innate and Adaptive Immunity</p> <p>(i) Innate Immune response, Pathogen Associated Molecular Patterns (PAMPs), Phagocytes and Lymphocytes as a key mediators of Immunity</p> <p>(ii) Adaptive Immune Response : Features of the adaptive immune response: (Specificity and Memory), Humoral Immunity & Cell-mediated Immunity (Antigen recognition and Antigen eradication, B cell clonal selection, Concept of antigen processing & presentation on MHC molecules)</p> <p>4. Principle of vaccination</p> <p>5. Inflammation: Principle components, Chemotaxis</p> <p>6. Consequences of Immune system failure : Autoimmunity, Immunodeficiency, & Hypersensitivity</p> <p>1. Primary and Secondary lymphoid Organs</p> <p>2. Primary lymphoid Organs (Thymus, Bone Marrow)</p> <p>3. Secondary Lymphoid Organs (Lymph nodes, Spleen, and Mucosa associated Lymphoid tissue (MALT))</p>	
2.	Generation of B cell & T cell response	<p>1. Immunogenicity Versus Antigenicity</p> <p>2. Haptens as valuable research and diagnostic tools</p> <p>3. Properties of Immunogen Contributing to Immunogenicity</p> <p>4. Biological System contribution in Immunogenicity</p> <p>5. Adjuvants : Freund's incomplete and complete adjuvant</p> <p>6. Epitopes : Characteristic Properties of B-cell epitope</p>	4
3.	Immunoglobulins Structure and Function	<p>1. Basic structure of antibodies, Chemical and enzymatic methods for basic antibody structure</p> <p>2. Fine structure of antibodies</p> <p>3. Antibody Classes and Biological activities</p> <p>4. Antigen determinants on Immunoglobulins : Isotype, Allotype & Idiotypic</p> <p>5. Immunoglobulin Superfamily</p> <p>6. Monoclonal Antibodies</p>	6
4	Antibody-mediated effector functions	<p>1. Opsonization</p> <p>2. Activation of complement system : Classical and alternative pathway</p> <p>3. Antibody-dependent cell mediated cytotoxicity (ADCC)</p>	3
	Organization and Expression of Immunoglobulin genes	<p>1. Immunoglobulin genes organization & Rearrangements</p> <p>2. Generation of antibody diversity</p> <p>3. Synthesis, assembly, and Secretion of Immunoglobulins</p> <p>4. Antibody Engineering</p>	4
	Antigen-Antibody Interactions	<p>1. Strength of antigen and antibody interactions: Antibody affinity, antibody avidity, and Cross reactivity</p> <p>2. Precipitation reactions (Immunodiffusion and Immunoelectrophoretic technique)</p> <p>3. Agglutination reaction</p> <p>4. Radioimmunoassay</p> <p>5. Enzyme linked Immunosorbant Assay (ELISA)</p> <p>6. Western blot</p> <p>7. Immunoprecipitation</p>	6

		8. Flow Cytometry	
5	The Major Histocompatibility Complex (MHC) and Antigen presentation	1. General Organization and Inheritance of the MHC, MHC molecules 2. Peptide binding by class I and class II MHC molecules 3. Experimental demonstration to prove processing of antigen is required for recognition by T cells 4. Antigen Presenting cells (APCs) 5. Antigen-Processing and Presentation Pathways (i) Endogenous Antigens: The Cytosolic Pathway (ii) Exogenous Antigens: The Endocytic Pathway	4
6.	Immune system in Health and Disease	1. Tolerance and Autoimmunity: Central and Peripheral Tolerance Establishment and Maintenance of Tolerance, Autoimmunity, Organ-Specific Autoimmune disease, Systemic Autoimmune Disease 2. Transplantation Immunology: Immunological basis of graft rejection, HLA typing, Mixed Lymphocyte Reaction, General Immunosuppressive Therapy 3. Immune Response to Infectious Diseases (Viral infections (Influenza virus) and bacterial infections (<i>Mycobacterium tuberculosis</i>), and Parasitic disease (<i>Plasmodium species</i>) 4. Vaccines: Active and Passive Immunization, Live, Attenuated vaccines, Inactivated or Killed Vaccines, Subunit and Conjugate Vaccines, DNA vaccines, Recombinant Vector Vaccines 5. AIDS: HIV infection of target cells and Activation of Provirus, Stages in viral replication cycle for therapeutic anti-retroviral drugs, Therapeutic agents inhibiting retrovirus replication 6. Cancer and the immune system: Origin and terminology, Malignant transformation of cells, Oncogenes and Cancer induction, Tumors of the immune system, Tumor antigens, Tumor evasion of the immune system, Cancer immunotherapy	6
Total Number of Lectures			41

METHODOLOGY:

The course would be taught through lectures, demonstrations and LCD powerpoint presentation.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	60 minutes	20
II Internal	30 minutes	15
Attendance		5
End Semester Exam	2 hours 30 minutes	60
Total		100

BOOKS RECOMMENDED:

1. Immunology by J. Kuby , 5th edition, W.H. Freeman and company, New York, 2002.
2. Essentials of Immunology by I. M. Roitt, 10th edition, MOSBY, Elsevier Ltd. (International Edition), 2002.
3. Cellular and Molecular Immunology by A. Abbas, 8th edition, Elsevier Ltd., 2014.

4. Molecular Biology of the Cell by B. Alberts, 5th edition, Garland Science, 2007.

PRACTICAL IN IMMUNOLOGY (2 Hs. Per Week)

MARKS 50

Sr. No.	Name of the experiment	Learning objective	Literature/ Weblinks for reference and videos
1.	To determine Blood Group antigens by hemagglutination assay	To understand about the various blood group antigens present in a population; principle of agglutination	Immunology, The experimental Series – II by W. Luttmann, K. Bratke, M. Kupper, Myrtek, USA, Elsevier, Academic Press; 2006
2.	Detection of syphilis using RPR card test	Immunological detection of specific bacterial infections by indirect agglutination	Manual of clinical laboratory Immunology by N. R. Rose, R. G. Hamilton, B. Detrick, 6 th edition, ASM Press, 2002. Practical immunology by F. C. Hay, M. R. Olwyn, 4 th edition, Westwood. Blackwell Publishing Company; 2002. Immunology by J. A. Owen, J. Punt, S. A. Kuby, 7th edition, USA: Susan Winslow; 2013
3.	Detection of typhoid infection by WIDAL test	Immunological detection of specific bacterial infections by direct agglutination	Manual of clinical laboratory Immunology by N. R. Rose, R. G. Hamilton, B. Detrick, 6 th edition, ASM Press, 2002. Immunology by J. A. Owen, J. Punt, S. A. Kuby, 7th edition, USA: Susan Winslow; 2013
4.	Density gradient separation of PBMCs using Histopaque-1077	Principle of density gradient separation of immune cells	Immunology by M. D, J. Brostoff, D. B. Roth, I. Roitt, 7th edition, Elsevier, 2007. Immunology, The experimental Series – II by W. Luttmann, K. Bratke, M. Kupper,

			<p>Myrtek, USA, Elsevier, Academic Press; 2006</p> <p>Cell Separation Media Methodology and Applications 18111569, handbook GE Healthcare</p> <p>Isolation of mononuclear cells Methodology and Applications 18-1152-69, handbook GE Healthcare</p> <p>http://www.gelifesciences.com/handbooks/</p>
5.	To study interaction of antigen and antibody by Ouchterlony double diffusion assay	To learn about precipitin phenomena at equimolar concentrations of antigen and antibody	<ul style="list-style-type: none"> <input type="checkbox"/> A handbook of practical and clinical immunology by G. P. Talwar, S. K. Gupta., 2nd ed. Vol. I & II; 2006 <input type="checkbox"/> Manual of clinical laboratory Immunology by N. R. Rose, R. G. Hamilton, B. Detrick, 6th edition, ASM Press, 2002. <input type="checkbox"/> Practical immunology by F. C. Hay, M. R. Olwyn, 4th edition, Westwood. Blackwell Publishing Company; 2002. <input type="checkbox"/> Immunology by M. D, J. Brostoff, D. B. Roth, I. Roitt, 7th edition, Elsevier, 2007.
6.	Determination of antibody titre by ELISA	To learn about different types of ELISA method and their applications	<ul style="list-style-type: none"> <input type="checkbox"/> A handbook of practical and clinical immunology by G. P. Talwar, S. K. Gupta., 2nd ed. Vol. I & II; 2006 <input type="checkbox"/> Manual of clinical laboratory Immunology by N. R. Rose, R. G. Hamilton, B. Detrick, 6th edition, ASM Press, 2002. <input type="checkbox"/> Immunology by J. A. Owen, J. Punt, S. A. Kubly, 7th edition, USA: Susan Winslow; 2013.
7.	Production of polyclonal antibodies in mouse	Principle of immunization, collection and analysis of serum for antibody	A handbook of practical and clinical immunology by G. P. Talwar, S. K. Gupta., 2 nd ed. Vol. I & II; 2006
8.	Purification of IgG from serum	Single step purification of IgG by affinity chromatography	<p>Physical Biochemistry, D. Freifelder, 2nd ed. W.H. Freeman and Company, New York; 1982</p> <p>Affinity Chromatography, Vol. 1: Antibodies, 18103746, handbook GE Healthcare</p> <p>http://www.gelifesciences.com/handbooks/</p>

PRACTICAL EVALUATION SCHEME**Examination****Marks**

SYLLABUS FOR B. TECH. BIOTECHNOLOGY

Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 404.1	3	3	2	-	-	2	-	-	2	3	-	3	2	1	-
BT 404.2	3	3	2	-	-	2	-	-	2	2	-	3	2	1	-
BT 404.3	3	2	2	-	-	2	-	-	2	3	-	3	2	1	-
BT 404.4	3	3	2	2	2	3	2	3	3	3	2	3	3	2	2
BT 404.5	3	2	2	1	-	1	-	-	2	2	-	2	3	2	2
BT 404.6	3	2	2	1	1	2	3	3	3	3	2	3	3	3	2

COURSE: DEVELOPMENTAL BIOLOGY**COURSE CODE: BT405****MARKS: 100****L T P H C****2 0 2 4 3****OBJECTIVE :**

The objective of the course is to develop a basic understanding of animal development, emphasizing on various stages in embryonic development. The course would also give an insight on the influences of environment in animal development and applications of basic research in developmental biology.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT405.1	Elucidate the morphological operations that convert a fertilized egg into a multicellular organism
BT405.2	Describe the molecular, biochemical, and cellular processes that control the formation of specialized cells, tissues, and organs during embryonic development
BT405.3	Recognize the model organisms utilized in the study of developmental biology and contrast the developmental schemes of various organisms
BT405.4	Explain the genetic, molecular, and cellular methods, inclusive of genome editing, employed to study the processes of development in different organisms
BT405.5	Showcase the ability to observe and use technical skills to obtain and examine quantitative data, interpret results, and present experimental data
BT405.6	Discuss the importance of developmental biology in reproduction including assisted reproductive technologies

PREREQUISITES:

The course requires senior school (10+2 or equivalent) level knowledge of development in animals.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1.	Introduction to Developmental Biology	<ul style="list-style-type: none"> • Early beliefs in organismal development • Discovery of primary embryonic organizer 	• 1
2	Gametogenesis and Fertilization	<ul style="list-style-type: none"> • Spermatogenesis and Oogenesis in placental mammals (mouse/human) • Comparison of internal and external fertilization • Steps in the fertilization process in mouse/human: Capacitation of sperm, Acrosome Reaction, Sperm-egg fusion, Activation of the egg, Fusion of sperm 	• 4

		and egg pro-nuclei, Prevention of polyspermy (with reference to placental mammals and sea urchin)	
	Embryonic Cleavage	<ul style="list-style-type: none"> • Cytoskeletal mechanisms in cleavage • Maternal-zygotic transition • Types of cleavage based on potentiality of blastomeres, position and amount of yolk, and position of mitotic spindles • Emphasis on cleavage in embryos of echinoderms (sea urchin), molluscs (snail), amphibians (frog) and placental mammals (mouse/human) 	• 4
	Stages after embryonic cleavage and Gastrulation	<ul style="list-style-type: none"> • Pre-implantation and implantation of mouse/human embryos • Primary germ layers and their derivatives in placental mammals • Various types of morphogenetic movements during gastrulation • Gastrulation in mouse/human embryos with emphasis on primitive streak, differentiation of lateral mesoderm and somitogenesis 	• 4
3	Genes and Development	<ul style="list-style-type: none"> • Origin of gene theories in development • Genomic equivalence: Evidences with emphasis on metaplasia and animal cloning, and exceptions to the rule • Differential gene expression: Regulation at the level of genome, transcription, translation and post-translation • Gene silencing: Antisense RNA and Gene knockouts • Cell fate specification based on position and lineage in early embryogenesis • Lateral inhibition in <i>Drosophila</i> neurogenesis 	• 5
3	Axes formation and Organogenesis	<ul style="list-style-type: none"> • Axes formation and early embryonic patterning in <i>Drosophila</i> and vertebrates • Homeotic genes • Development of the germ layer derivatives with emphasis on the formation of central nervous system and epidermis, fore-limb and hind-limb in vertebrates 	• 4
4	Metamorphosis and Regeneration	<ul style="list-style-type: none"> • Complete and incomplete metamorphosis, metamorphosis in insects and Anurans • Epimorphosis, Morphallaxis and Compensatory regeneration 	• 3
5	Environmental influences in development	<ul style="list-style-type: none"> • Environmental disruption of normal development • Teratogens, with emphasis on alcohol, retinoic acid and pathogens • Endocrine disruptors 	• 3
6	Translational developmental biology	<ul style="list-style-type: none"> • Biology of stem cells Applications of stem cells in regenerative medicine Assisted reproductive technology on <i>in vitro</i> fertilization (IVF) and intra-cytoplasmic sperm injection (ICSI) • Genetically modified organisms (GMOs) and their applications in biomedical research 	• 2

Total Number of lectures	30
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METHODOLOGY:

The course would be covered through lectures and group discussions using teaching aids.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS/JOURNALS RECOMMENDED:

1.
 1. Gilbert, S. F., Barresi, M. J. F. (2016). Developmental Biology, Eleventh Edition, Sinauer Associates Inc.
 2. Wolpert, L., Tickle, C., Arias A. M. (2015). Principles of Development, Fifth Edition, Oxford University.
 3. Slack, J. M. W. (2012). Essential Developmental Biology, Third Edition, Wiley- Blackwell.
 4. S. Sell (Ed.) (2013). Stem Cells Handbook, Second Edition, Humana Press, New York, USA.
2. Genes and Development, Cold Spring Harbor, New York, USA, Years: 1987–present.
3. Development, The Company of Biologists, United Kingdom, Years: 1953–present, **Journal ISSN:** 0950-1991 (print); 1477-9129 (web), (Former name: Journal of Embryology and Experimental Morphology).
4. Developmental Biology, Elsevier B.V., Amsterdam, Netherlands, Years: 1959–present, **Journal ISSN:** 0012-1606 (print); 1095-564X (web).

PRACTICAL IN DEVELOPMENTAL BIOLOGY (2 hours per week)**MARKS: 50**

Sr. No.	Name of the Experiment	Learning objective	Literature/ Weblinks for reference and videos
1.	Introduction to life cycle in animal development (eg: <i>Drosophila</i>).	Familiarization with various stages of life cycle in insects. Understanding the the phenomenon of metamorphosis, and differentiation of the sexes.	Fly Pushing: The theory and practice of <i>Drosophila</i> genetics, By R. J. Greenspan 2 nd Edition The Neurosciences Institute, San Diego.
2.	Dissection and identification of imaginal discs in the third instar larval stages in <i>Drosophila</i> .	Familiarization with the location and types of the progenitors of various adult structures.	1) Dissection of imaginal discs from 3rd instar <i>Drosophila</i> Larvae, D. C. Purves and C. Brachmann. <i>J Vis Exp</i> ; (2): 140. 2007. 2) The preparative isolation of imaginal discs from larvae of <i>Drosophila Melanogaster</i> , J. W. Fristrom and H. K. Mitchell, <i>J Cell Biol</i> ; 27: 445–448, 1965. 3) Fly Pushing: The theory and practice of <i>Drosophila</i> genetics, By R. J. Greenspan 2 nd Edition The Neurosciences Institute, San Diego.
3.	Preparation and mounting of adult <i>Drosophila</i> structures in Hoyer's medium or Canada balsam.	Familiarization with wings, legs and thorax in adult flies and understanding the patterning of these cuticular structures.	1) Preparation and mounting of adult <i>Drosophila</i> structures in Canada balsam, D. L. Stern and E. Sucena, <i>Cold Spring Harb Protoc</i> ; 373-375, 2012. 2) Preparation and mounting of adult <i>Drosophila</i> structures in Hoyer's medium, D. L. Stern and E. Sucena, <i>Cold Spring Harb Protoc</i> , 107-109, 2012.
4.	Examination of external morphology of <i>Drosophila</i> eyes using nail polish imprint technique.	Understanding the patterning of compound eye in insects.	A simple nail polish imprint technique for examination of external morphology of <i>Drosophila</i> eyes, R. Arya and S. C. Lakhotia, <i>Curr Sci</i> ; 90:1179-1180, 2006.

Sr. No.	Name of the Experiment	Learning objective	Literature/ Weblinks for reference and videos
5.	Preparation and identification of 48 hours and 96 hours chick whole-embryos using filter paper ring technique.	Familiarize with prominent structures formed during organogenesis in early chick embryos.	Improved method for chick whole-embryo culture using a filter paper carrier, S. C. Chapman et al, <i>Dev Dyn</i> ; 220:284-289, 2001.
6.	Study of cell death during morphogenesis	Observation of cell death in chick embryos (5 days old) limb morphogenesis	
7.	Staining bone and cartilage in zebrafish (<i>Danio rerio</i>) embryos.	To study skeletogenesis using a unique model that is amenable to developmental analyses and genetic screening.	1) A two-color acid-free cartilage and bone stain for zebrafish larvae, M. B. Walker and C. B. Kimmel, <i>Biotechnic & Histochemistry</i> , 82: 23-28, 2006. 2) Zebrafish embryology and cartilage staining protocols for high school students, Emran F et al, <i>Zebrafish</i> ; 6: 139-143, 2009.
8.	Study of regeneration in Hydra	Observation of regeneration process in Hydra	

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 405.1	1	2	1	-	-	1	-	1	1	1	-	2	2	1	-
BT 405.2	1	2	1	2	2	1	-	1	1	1	-	2	2	1	-
BT 405.3	1	1	1	1	1	1	1	1	1	1	1	3	2	1	1
BT 405.4	2	2	1	3	2	1	1	1	1	1	1	3	3	2	2
BT 405.5	2	3	1	3	2	1	1	1	1	1	1	2	3	2	2
BT 405.6	2	2	1	3	2	1	-	2	1	2	1	3	3	2	3

COURSE: INDIAN KNOWLEDGE SYSTEM: INDIAN REGIONAL BIODIVERSITY**COURSE CODE: BTIKS401****L T P H C****MARKS: 50****0 1 0 1 1****OBJECTIVE :**

The objective of this course is to make students aware and familiarize them with the Indian Knowledge System to create a holistic and culturally sensitive learning environment. By incorporating elements of IKS into modern education, students can gain a deeper understanding of their cultural heritage, diverse perspectives, and alternative ways of knowing.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BTIKS401.1	Understand a holistic understanding of India's traditional knowledge systems and their relationship with regional biodiversity
BTIKS401.2	Explore various biogeographical zones and their characteristics
BTIKS401.3	Analysis of India's various ecosystems, that include tropical rainforests, deserts, marshes, and mountain ranges, regional biodiversity influencing ecosystem processes and services.
BTIKS401.4	Assess the present conservation problems facing Indian regional biodiversity and evaluate viable methods and policies for the protection and sustainable management of these natural resources.

PREREQUISITES:

Open to new ideas and willingness to learn and contribute.

COURSE DESCRIPTION

Unit	Topic	Detailed syllabus	No. of Lectures
1.	Introduction to Indian Knowledge System (IKS),	<ul style="list-style-type: none"> • Overview of India's traditional knowledge systems (e.g., Ayurveda, Yoga, Vastu Shastra, etc.). • Understanding the integration of traditional knowledge with nature and biodiversity. • Role of traditional ecological knowledge in resource management. 	1

2	Biogeographic Zones of India	<ul style="list-style-type: none"> • Overview of India's biogeographic zones and their characteristics. • • Study of the Himalayan region, Indo-Gangetic Plains, Western Ghats, Eastern Ghats, Deccan Plateau, and coastal areas. 	3
2.	<i>Biodiversity of the Western Ghats, Coastal areas and marine ecosystems</i>	<ul style="list-style-type: none"> • Exploration of the Western Ghats biodiversity hotspot. • Tropical rainforests and endemic species. • Threats and conservation challenges. • Traditional ecological insights and conservation practices. • Coastal areas, mangroves, estuaries, and marine biodiversity. • Traditional knowledge related to coastal resource management. • Conservation policies and practices integrating traditional wisdom. 	4
3.	Biodiversity of the Indo-Gangetic Plains, Forests, Desert ecosystems	<ul style="list-style-type: none"> • Flora and fauna of the Indo-Gangetic region. • Riverine ecosystems and their ecological importance • Tropical and sub-tropical evergreen and deciduous forests. • Protected areas and wildlife reserves. • Thar Desert ecosystems and adaptations 	4
4.	<i>Conservation Strategies</i>	Habitat destruction and fragmentation <ul style="list-style-type: none"> • Pollution and its impact on biodiversity. • Climate change and its implications for Indian biodiversity. • Integration of traditional ecological knowledge with modern conservation strategies. • Collaborative conservation efforts with local communities. • • Ethical considerations and issues related to biodiversity research and conservation. 	4
		TOTAL	16

METHODOLOGY

The course will be covered through lectures & assignments.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

BOOKS RECOMMENDED:

1. Introduction to Indian knowledge system: concepts and applications. ISBN: 9789391818203, authors: B. Mahadevan, Nagendra Pavana , Vinayak Rajat Bhat.
2. Living with others (Biodiversity around us). ISBN: 9788123017464. author: M.A. Haque
3. 3) Biodiversity and livelihood: lessons from community research in India. ISBN: 978-981-14-8307-3, authors: Oommen V., Oommen, Laladhas K, Erach Bharucha

- 4) Biodiversity traditional knowledge and intellectual property rights, ISBN: 9788172339692, authors: s. Ram Reddy, M. Surekha, V. Krishna Reddy
- 6) Biodiversity hotspot of the western ghats and Sri Lanka. ISBN:9781774913758, author: T. Pullaiah
- 7) Ethnobotany of India, volume 2: western ghats and west coast of peninsular India, ISBN: 978-1771884044, authors: T. Pullaiah, K. V. Krishnamurth, Bir Bahadur
- 8) SAHYADRI : WESTERN GHATS BIODIVERSITY INFORMATION SYSTEM
(<http://ces.iisc.ernet.in/biodiversity>)

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BTIKS401.1	-	-	-	-	-	-	2	-	1	-	-	-	-	1	-
BTIKS401.2	-	1	-	-	-	1	2	-	1	-	-	1	-	1	-
BTIKS401.3	1	1	1	-	1	1	2	-	1	-	-	-	-	-	-
BTIKS401.4	1	1	1	-	1	1	2	1	1	-	-	1	1	1	-

COURSE: APTITUDE BUILDING-IV**COURSE CODE: BTAEC401****L T P H C****MARKS: 50****0 0 2 2 1****OBJECTIVE**

- To enhance the logical reasoning skills of the students and help them improve the problem-solving abilities
- To acquire skills required to solve quantitative aptitude problems
- To boost the verbal ability of the students for academic and professional purposes

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BTAEC401.1	Apply critical thinking skills, such as problem solving related to their subject matter
BTAEC401.2	Demonstrate competency in verbal, quantitative and reasoning aptitude
BTAEC401.3	Display good written skills for use in academic and professional scenarios
BTAEC401.4	Develop technical skills

PREREQUISITE:

Students should be familiar with basic scientific concepts to take up this course.

COURSE DESCRIPTION

Sr. No.	Practical/Training/Tests/Interviews	Contact Hours
1	Logical Reasoning	04
2	Data interpretation and Data sufficiency - Advanced	04
3	Time and work– Advanced	02
4	Time, Speed and Distance - Advanced	04
5	Profit and loss, Partnerships and averages - Advanced	02
6	Number system - Advanced	02

7	Choice and Instruments and protocols for solving biological problems	02
8	Establishment of stable trans-gene expression in unicellular and multicellular systems	02
9	Monoclonal antibodies, Biosimilars	02
10	Competitive Examination Preparation	02
11	Mock Interviews	02
12	Discussion session-Industry Experts/Academia Experts/Alumni	02
	TOTAL	30

METHODOLOGY

The course will be covered through Lectures/Assignments/Practical/Training/Tests/Interviews

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Continuous Internal Assessment		20
Attendance		
Assignments/Practical/Training/Tests/Interviews		30
Total		50

BOOKS RECOMMENDED:

1. R. S. Aggarwal, (2017). Quantitative Aptitude for Competitive Examinations, 3rd (Ed.). New Delhi: S. Chand Publishing
2. ETHNUS, (2016). Aptimithra, 1st (Ed.). Bangalore: McGraw-Hill Education Pvt. Ltd.
3. Arun Sharma, (2016). Quantitative Aptitude, 7th (Ed.). Noida: McGraw Hill Education Pvt. Ltd.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BTAEC401.1	-	2	2	1	2	-	-	-	-	1	-	2	2	-	-
BTAEC401.2	1	1	1	-	-	-	-	-	-	1	-	-	1	-	-
BTAEC401.3	1	1	1	-	2	-	-	-	-	2	-	-	1	-	-
BTAEC401.4	1	1	1	-	1	-	-	-	-	1	-	-	1	-	-

SEMESTER V						
Course Code	Course Name	L	T	P	H	Cr
BT501	Environmental Biotechnology	2	0	2	4	3
BT502	Recombinant DNA Technology	2	0	4	6	4
BT503	Biochemical Engineering & Bioprocess Technology	3	0	4	7	5
BT504	Enzymology & Enzyme Technology	2	0	2	4	3
BI501	R Programming	1	0	0	1	1
BT 505/BT506/ BT507	Elective-I BT505 Biopharmaceuticals BT506 Clinical Research BT507 Human Diseases and Pathobiology	3	0	2	5	4
BTSEC501	Science communication	0	0	2	2	1
BTAEC501	Aptitude Building-V	0	0	2	2	1
	Total	13	0	18	31	22

COURSE: ENVIRONMENTAL BIOTECHNOLOGY**COURSE CODE: BT501****L T P H C****MARKS: 100 (Theory 50 + Practical 50)****2 0 2 4 3****OBJECTIVES OF THE COURSE:**

The objective of the course is to familiarize the students with advanced research area and basic concept in Environmental Biotechnology.

COURSE OUTCOMES:

CO No.	At the end of the course, the learner should be able to:
BT501.1	Classify types of pollution and illustrate application of biotechnology for a pollution-free environment
BT501.2	Discuss different waste water treatment systems and analyse the decay behaviour of xenobiotic compounds
BT501.3	Demonstrate the process of bioremediation and illustrate the management of hazardous waste
BT501.4	Describe the role of biofuels in environmental sustainability and explore advanced systems for environmental management

PREREQUISITES

Since the course is very important in science, student must know about the new biotechnological methods which to apply in environment. Student must have background with Biotechnological aspects and molecular genetics.

COURSE DESCRIPTION

Sr. No.	Topic	Detail Syllabus	No. of Lectures
1	Environmental Biotechnology	Role of Biotechnology in protection and conservation of Environment	02
	Environmental Pollution	Types of Pollution and their sources (Water pollution, Soil Pollution, Air Pollution, Noise Pollution) Case studies and Innovative technologies for preventing pollution	04
2	Microbiology of waste water treatment	Aerobic System Biological processes for domestic and industrial waste water treatments; Aerobic systems - activated sludge process, trickling filters, biological filters, rotating biological contractors (RBC), Fluidized bed reactor (FBR), expanded bed reactor, Inverse fluidized bed biofilm reactor (IFBBR) packed bed reactors air- sparged reactors. Anaerobic System Anaerobic biological treatment - contact digesters, packed column reactors, UASB. Biofilms and its relevance in microbial survival	06
2	Microbiology of degradation of xenobiotics	Xenobiotics in environment Decay behavior of xenobiotics	03
3	Bioremediation	Bioremediation I & II Solid phase bioremediation - land farming, prepared beds, Phytoremediation, Composting, Vermicomposting technology	05
	Hazardous Waste Management & safety guidelines for disposed	Biotechnology application to hazardous waste Management Detoxification of chemical waste	03
4	Bio Fuels	Microorganisms and energy requirements of mankind, Production of nonconventional fuels - Methane (Biogas), Hydrogen, Alcohols and algal hydrocarbons, Use of microorganisms in augmentation of petroleum recovery. Bioplastic-biopol, microbial rubber & adhesive polymers	05

Advances in Environmental Biotechnology	GIS in Environmental Management Computer based Environmental modeling Design of ETPs	02
Total number of Lectures		30

METHODOLOGY

The course would be taught through lectures, demonstrations and practical.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal*	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

*Average of Internal I (15 marks) and Internal II (15 marks)

BOOKS RECOMMENDED:

1. Stanier R. Y., Ingram J.L., Wheelis M.L., Painter R.R., General Microbiology, McMillan Publications, 1989.
2. Foster C.F., John Ware D.A., Environmental Biotechnology, Ellis Horwood Ltd., 1987.
3. Karrely D., Chakrabarty K., Omen G.S., Biotechnology and Biodegradation, Advances in Applied Biotechnology Series, Vol.4, Gulf Publications Co. London, 1989.
4. Bioremediation engineering; design and application 1995 John. T. cookson, Jr. Mc Graw Hill, Inc.

PRACTICAL IN ENVIRONMENTAL BIOTECHNOLOGY 2 Hs per week Marks:50

- 1) Methods of sampling for pollution measurement
 - a) Statistical design for collection of samples from site
 - b) Air sampling (Impaction)
 - c) Soil sampling (soil probes/auger)
 - d) Water sampling (Niskin type or equivalent depth sampling)
- 2) Methods of Pollution Measurement (as per Indian and global recommendations)
 - a) Air pollution by measurement of SOX (sulphur oxides-di), NOX (nitrous oxide-di) and suspended particulate matter.
 - b) Water pollution by measurement of water conductivity, pH, dissolved oxygen, and turbidity.
 - c) Soil pollution by measurement of metals and organic compounds.
 - d) At least one representative biological indicator for each of air (lichens), water (Macroinvertebrate) and soil (Moss) pollution.
 - e) Graphical representation of the data collected after analysis of samples and comparison of values with Indian and Global standards.

- 3) (Please delete this practical) Community analysis of polluted and non-polluted sites by PCR based methods (eukaryotic and prokaryotic domain primers). Comparison of polluted versus non-polluted sites to ascertain the possible alteration in community structure introduced due to pollutant.
- 4) Microbial biodegradation (aerobic and anaerobic) of any one pollutant (e.g. hydrocarbon) or any xenobiotic and study of its decay behaviour.
- 5) Bioremediation – Monitoring uptake of heavy metals using biological methods- organisms.
- 6) Demonstration for biogas production/Agro-waste composting/visit to wastewater plant/ biogas plant.

Note: Wherever it is not possible to perform the experiment due to limitation of equipment or other reasons, a demonstration will be arranged, however no more than 10% practical's will be demonstrations.

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 501.1	2	2	3	2	-	3	3	3	3	1	2	3	2	-	-
BT 501.2	3	3	3	3	3	3	3	2	1	2	2	3	2	1	-
BT 501.3	2	2	3	3	2	2	3	2	2	1	2	3	2	1	-
BT 501.4	3	2	2	2	3	3	3	3	2	2	2	3	2	1	1

COURSE: RECOMBINANT DNA TECHNOLOGY

COURSE CODE: BT502

MARKS:150(Theory 50+Practical 100)

L T P H C
2 0 4 6 4

OBJECTIVES: To familiarize the student with emerging field of biotechnology i.e. Recombinant DNA Technology, as well as to create understanding and expertise in wet lab techniques in genetic engineering.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT502.1	Apply the knowledge of molecular biology for genetic engineering using various gene manipulation tools
BT502.2	Demonstrate different recombinant DNA techniques for manipulation of DNA, RNA and protein
BT502.3	Employ different gene cloning strategies to optimize various applications in genetic engineering

BT502.4	Plan and employ different recombinant DNA techniques in healthcare and agricultural sector
BT502.5	Apply genetic engineering techniques in diagnosis of human disorders and employ suitable therapies
BT502.6	Outline cross disciplinary genetic engineering approaches along with ethical issues for commercialization of genetically modified products

Prerequisites: Knowledge of molecular biology is sufficient.

COURSE DESCRIPTION

Unit	Topics	Detail Syllabus	No. of Lectures
1	Introduction	Landmarks in Molecular biology and Biotechnology What is genetic engineering and recombinant DNA technology? Advantages of using microorganisms in Genetic Engineering Genetic engineering in <i>E. coli</i> and other prokaryotes, yeast, fungi and mammalian cells.	2
	Tools in genetic engineering	Enzymes: DNA polymerases, ligases, reverse transcriptases, nucleases restriction endonucleases (Restriction modification system, Restriction mapping) and terminal transferases, phosphatases, polynucleotide Kinase etc. Cloning vectors: plasmids, bacteriophage vectors, cosmids, phagemids BAC, YAC vectors, Shuttle vectors, expression vectors etc.	5
2	Recombinant DNA techniques	Polymerase chain reaction (PCR) and its types Molecular Probes and Nucleic acid labeling Blotting Techniques (Northern, Southern and Western) Autoradiography, Hybridization, DNA footprinting, Electrophoretic mobility gel shift assay (EMSA) DNA sequencing, site directed mutagenesis and its applications DNA fingerprinting, RAPD, RFLP, AFLP. Different methods for analysis of gene expression	6
3	Gene cloning	Isolation and purification of DNA (genomic, plasmid) and RNA. Isolation of gene of interest- restriction digestion, electrophoresis, Cutting and joining of DNA Methods of gene transfer in prokaryotic and eukaryotic cells. Methods for Recombinant selection and screening: genetic, immunochemical, South-western analysis, nucleic acid hybridization, HART, HRT Expression of cloned DNA molecules and maximization of gene expression Cloning strategies- genomic DNA libraries, cDNA libraries, subtractive hybridization, chromosome walking and jumping.	7
4	Applications of Recombinant	Gene therapy, medicine, crop improvement, disease resistance: In vivo approach, ex-vivo approach of gene therapy, Antisense therapy,	5

	DNA technology	Interference technology (siRNA, shRNA, miRNA) CRISPAR Cas 9 mediated gene therapy, Transgenics	
5	Genetic disorders, Diagnosis and screening	Prenatal diagnosis, Single nucleotide polymorphisms, DNA microarrays, Future strategies.	2
6	Protein interaction technology	Two-hybrid and other two component systems Detection using GST fusion protein, co-immunoprecipitation, FRET, BRET, Phage display assays, Surface plasmon resonance (SPR) etc	2
	The Human Genome Project	The Human Genome Project Objectives and its outcome.	1
Total no. of Lectures			30

METHODOLOGY : The course will be covered through lectures supported by PowerPoint presentations, research articles and practical teaching.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal*	45 min.	15
Teachers assessment		05
End Semester Examination	1 Hrs 15 min.	30
Total		50

*Average of Internal I (15 marks) and Internal II (15 marks)

PRACTICAL IN RECOMBINANT DNA TECHNOLOGY (4 hours per week) Marks: 100

LIST OF PRACTICALS:

1. Requirement of a genetic engineering lab including physical containment facilities and other biosafety procedures
2. Culturing Escherichia coli K12 and making competent cells for transformation
3. Preparation of the vector DNA and target DNA, ligation and transformation
4. Elution of DNA from Agarose gel

5. Selection of transformants by
 - a) Antibiotic resistance
 - b) Blue-white screening
 - c) Restriction analysis
6. Preservation and storage of clones
7. Cloning in expression vectors for expression of specific genes
8. Target DNA amplification by polymerase chain reaction
9. DNA finger printing technique RFLP/RAPD
10. Bioinformatics tools in Genetic engineering

PRACTICAL EVALUATION SCHEME

Examination	Marks
Practical Internal (Continuous) assessment:	40
End semester examination:	60
Total:	100

REFERENCES:

1. Primrose, S. B. and Twyman, R. M. , Principles of Gene Manipulation and Genomics, eighth edition, John Wiley and Sons Ltd, June 2016
2. Reece, R. J., Analysis of gene and Genome, Wiley, 2004
3. Brown, T. A, Gene Cloning and DNA Analysis: An Introduction, Eighth edition, Wiley-Blackwell, 2020
4. Michael R.G, Sambrook J, Molecular Cloning A Laboratory Manual (Vol 1,2,3) , Fourth edition, Cold Spring Harbor Laboratory Press, 2013

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 502.1	3	1	1	1	3	1	1	1	1	1	1	3	3	2	1
BT 502.2	3	3	3	3	3	1	2	2	2	3	1	3	1	3	1
BT 502.3	3	3	3	3	3	2	2	2	3	2	2	3	3	1	1

BT 502.4	3	3	3	3	3	3	3	3	3	2	2	3	3	1	1
BT 502.5	3	3	3	3	3	3	2	3	3	2	3	3	3	1	1
BT 502.6	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3

COURSE: BIOCHEMICAL ENGINEERING AND BIOPROCESS TECHNOLOGY**COURSE CODE: BT503****MARKS: 200 (Theory 100+Practical 100)****L T P H C****3 0 4 7 5****OBJECTIVE**

The objective of the course is to create general understanding amongst the students in the subject of Biochemical Engineering and fermentation technology through in-depth lectures. The objective of the

course is creating an understanding of concepts of and basic principles in the subject with emphasis on how to apply the knowledge in industrial processes involving Biochemical Engineering. The students would learn industrial techniques as: Isolation, improvement, maintenance and preservation of microbial cultures, Design of media, bioreactors and downstream processes along with production studies during the tenure of their study.

COURSE OUTCOMES

CO No.	At the end of the course, the learner should be able to:
BT503.1	Explain the basic concepts in biochemical engineering and bioprocess technology
BT503.2	Demonstrate various techniques for isolation, preservation, and strain improvement of industrially important microbes
BT503.3	Design a fermentation process by manipulating the media, inoculum, sterilization techniques and bioreactors
BT503.4	Demonstrate different downstream processing methods employed to purify the desired products
BT503.5	Determine the bioprocess kinetics of different cultures and understand fluid rheology, product formation and mass transfer
BT503.6	Plan and design bioprocess scale up methods to produce useful metabolites

PREREQUISITES

This is an introductory level course. Students are expected to have an understanding of introductory knowledge in Physics, Chemistry and Biology.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1.	Introduction to Biochemical Engineering and Bioprocess Technology	Historical background of Biochemical engineering, Introduction of industrially important biotechnologically products	2
2.	Isolation of microbes and Strain improvement	Isolation and preservation of industrially important microbes and introduction of strain improvement	3
3	Design of fermentation media and inoculum development	Nutritional media components essential for growth of microorganisms and product formation, Media optimization using conventional and statistical designs, Inoculum development for bacterial, fungal and yeast strains	4
	Design of Fermenter, types of Bioreactors, Instrumentation and control	Design of fermenter and its important parts, Bioreactor types for products of microbial, plant and animal origin, Sensors for measurement of different bioprocess parameters, process control, Data analysis during process	7

3	Sterilization	Sterilization of Fermenter (batch and continuous processes), Feed sterilization, filter sterilization and sterilization of liquid waste	3
4	Downstream Processing	Cell separation techniques, Concentration of metabolites, Purification of metabolites	6
5	Bioprocess Kinetics	Introduction of Stoichiometric analysis and yield concept with examples, ideal and nonideal bioreactors, Kinetics of microbial growth, Batch, continuous, fed-batch culture, Plug flow bioreactor, Product formation kinetics, Substrate utilization kinetics and Cell death kinetics	10
	Fluid flow and Mass Transfer	Introduction to Newtonian and Non-Newtonian fluids and rheology, Mass transfer concepts in different phase systems, K_{La} and oxygen transfer rate	4
6	Scale up, Bioprocess Economics	Concept of scale up and scale down and consideration of important parameters for scale up, Introduction to Bioprocess Economics	2
	Biosynthesis of Metabolites	Examples of Industrial Production of few metabolites starting from inoculum development to downstream processing	4
Total Number of Lectures			45

METHODOLOGY

The course will be covered through lectures supported by tutorials and laboratory practical's. Students will be evaluated based on two class tests, lecture and laboratory attendance, class participation.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	45 minutes	15
II Internal	45 minutes	15
Teachers assessment		10
End Semester Exam	2 hours 30 minutes	60
Total		100

REFERENCES:

1. P. F. Stanbury, A. Whitaker and S. J. Hall. 'Principles of Fermentation Technology', Pergamon Press, Oxford and revised editions 1995.
2. J. E. Bailey, D. F. Ollis Biochemical Engineering Fundamentals, 2nd edition, McGraw-Hill, New York) and revised editions 1986.
3. Pauline Doran, Bioprocess Engineering Principles, Academic Press (1995) and revised editions.
4. Shuler, ML and F. Kargi. Bioprocess. Engineering: Basic Concepts (Second Ed.). Prentice Hall, Englewood Cliffs, NJ. 2002.
5. A.H. Patel. Industrial Microbiology. MacMillan 2000.
6. Casida, L E JR Industrial Microbiology, Wiley Eastern (revised editions) 1984.

PRACTICALS IN BIOCHEMICAL ENGINEERING AND BIOPROCESS TECHNOLOGY (4 Hrs. Per Week) MARKS : 100

LIST OF PRACTICALS

1. Isolation of industrially important microorganisms by screening methods such as enzyme producer, antibiotic producer etc.
2. Introduction of different Preservation techniques of industrially important microorganisms.
3. Demonstration of various parts of lab scale fermenter and study of bioreactor design.
4. Study of microbial growth kinetics and growth curve. Determination of growth rate constant, generation time, specific growth rate and saturation constant.
5. Production of alpha amylase by solid state fermentation and downstream processing for recovery of enzyme and determination of enzyme activity.
6. Production of streptomycin/penicillin antibiotic by fed batch fermentation and determination of antibiotic activity.
7. Production of bioethanol from sugarcane juice and molasses. Downstream processing for recovery of bioethanol by simple distillation and chemical estimation of bioethanol.
8. Production of citric acid using *Aspergillus niger* by surface and submerged fermentation and study of rheological parameters. Recovery of citric acid by precipitation method and chemical estimation of citric acid.
9. Determination of K_{La} by sulphite oxidation method.
10. Determination of thermal death point and thermal death time of different microorganisms.
11. Immobilization of whole cells for demonstration of its biological activity.
12. Industrial visit to fermentation industry.

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) Assessment	40
End semester Exam	60
Total	100

References:

1. Manual of Industrial Microbiology and Biotechnology, (2nd Edition by Arnold L. Demain and Julian E. Davies, Ronald M. Atlas, Gerald Cohen, Charles L. Hershberger, Wei-Shou Hu, David H. Sherman, Richard C. Willson and J. H. David Wu)
2. Industrial Microbiology-An introduction
(By Michael J. Waites, Neil L. Morgan, John S. Rockey and Gary Higton)
3. Principles of Fermentation Technology
(2nd edition, by Peter F. Stanbury, Allan Whitaker and Stephen J. Hall, Butterworth-Heinemann, An imprint of Elsevier Science)
4. Fermentation and Enzyme Technology By D.I.C. Wang, C.L. Cooney, A.L. Demain, P. Dunnill, A.E. Humphrey & M.D. Lilly John Wiley and sons, New York

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 502.1	2	-	1	3	-	2	-	-	3	3	-	3	3	2	1
BT 502.2	1	2	3	2	3	2	3	2	2	2	2	3	3	2	1
BT 502.3	2	2	3	3	3	2	3	3	2	1	3	2	3	2	2
BT 502.4	1	3	3	3	2	1	2	2	3	2	3	3	3	2	2
BT 502.5	2	2	3	3	2	1	2	2	2	3	2	3	3	2	2
BT 502.6	3	2	3	3	3	2	3	2	3	2	3	3	3	2	3

COURSE CODE:BT504**L****T P H C****MARKS: 100 (Theory 50+Practical 50)****2 0 2 4 3****OBJECTIVE**

- To familiarize the student with enzyme classification, enzyme-substrate interactions as well as mechanism of enzyme action
- To create thorough understanding regarding kinetics of allosteric and non allosteric enzymes.
- To impart knowledge about modeling of enzyme systems and structure-function relations in enzymes.
- To familiarize the student with Immobilization techniques and applications.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT504.1	Classify enzymes on the basis of their attributes, naming conventions, features, and mechanism of action
BT504.2	Apply biochemical computations for determining the kinetics of enzymes
BT504.3	Compare and contrast the techniques for production, purification, identification, and immobilization of enzymes
BT504.4	Comprehend advances in enzyme technology and enzyme engineering

PREREQUISITES

This is an advanced course. The student should be aware of basics in enzymology as well as some fundamental aspects of biomolecules and chemistry.

COURSE DESCRIPTION

Unit	Topics	Detail Syllabus	No. of Lectures
1	Enzymes	Classification: Trivial and Enzyme Commissions System of nomenclature EC system, Properties of enzymes. Enzyme substrate interactions, enzyme substrate complex, concept of active site, transition state theory. Factors affecting enzyme activity: Effect of pH, temperature and substrate concentration on reaction rate	06
	Mechanism of enzymatic Reactions	Enzyme Catalysis: Factors affecting catalytic efficiency - proximity and orientation effects. Bisubstrate reactions: single and double displacement reactions. Enzyme catalysis: acid-base, covalent and metal ion. Chemical modification of enzymes. Isoenzymes and multiple forms of enzymes.	05
2	Enzyme Kinetics	Enzyme activity, international Unit, specific activity, turnover number.	8

		Michaelis Menten equation, Significance of K_m and V_{max} , Enzyme inhibition and kinetics: competitive, non competitive, uncompetitive and mixed. Structure-Function Relations: chymotrypsin, lysozyme, metalloenzyme .	
	Allosteric interactions and Enzyme Regulations	Allosteric enzymes :Types, positive and negative cooperativity, theory of concerted and sequential models, kinetics of Allosteric enzymes. Enzyme Regulation: Feedback inhibition, covalent modification and Zymogen activation.	5
3	Enzyme Immobilization and applications	Methods of immobilization: ionic binding, adsorption, covalent binding (based on R groups of amino acids), microencapsulation and gel entrapment. Applications of enzymes: Food processing, medicine, diagnostics, leather industry, textile industry.	4
4	Enzyme Technology	Recent advances in enzyme technology, <u>enzyme engineering</u> , <u>artificial enzymes</u> .	2
Total Number of Lectures			30

METHODOLOGY

The course will be covered through lectures and supported by practical.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal*	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

*Average of Internal I (15 marks) and Internal II (15 marks)

PRACTICAL IN ENZYMOLOGY AND ENZYME TECHNOLOGY (2 Hrs. Per Week)

MARKS: 50

List of Practicals:

1. Handling of enzymes and estimation of specific activity of an enzyme (e.g. amylase, phosphatase, protease)
2. Isolation of β -amylase from sweet potato (*Ipomoea batatas*)/ barley (*Hordeum vulgare*) and determination of enzyme activity using specific substrate
3. Purification of enzyme by ammonium sulphate precipitation
4. Effect of physicochemical parameters (pH, temperature) on the activity of enzyme
5. In situ enzyme activity staining on SDS-Polyacrylamide gel.
(Amylase, Lactate dehydrogenase)

6. Immobilization of enzyme by gel entrapment and cross linking method
- 7.* Study on enzyme inhibition.

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

REFERENCES:

1. Fundamentals of Enzymology: The Cell and Molecular Biology of Catalytic proteins by Nicholas C. Price and Lewis Stevens; 3rd edition, 2010
2. Enzymes: Biochemistry, Biotechnology, Clinical Chemistry by Trevor Palmer; 2nd edition, 2008
3. Enzyme Technology by Ashok Pandey, Colin Webb, Carlos Ricardo Soccol, Christian Larroche, 2005
4. Principles of Biochemistry by Lehninger, Nelson Cox, 4th edition, 2017
5. Biochemistry by Lubert Stryer, 4th edition, 1995

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 504.1	2	3	3	3	-	1	-	-	2	2	2	3	2	2	-
BT 504.2	3	3	2	2	2	1	-	-	2	2	3	3	2	2	1
BT 504.3	3	3	3	2	1	1	2	2	2	1	2	3	2	1	1
BT 504.4	2	2	1	2	2	3	2	2	2	3	3	3	3	2	1

COURSE: R PROGRAMMING**COURSE CODE: BI501 L T P H C****MARKS: 50 (Theory 50) 1 0 0 1 1****Course Outcomes**

CO No.	At the end of the course, the learner should be able to:
BI501.1	Apply the essential concepts of R programming
BI501.2	Use various data structures for writing programs
BI501.3	Apply data and file handling features in writing a program
BI501.4	Implement statistical packages in R programming for analyses of biological data

Prerequisite –

- In depth knowledge of C programming is required
- Basic understanding of Statistics & Data Structure
- Basic knowledge of Molecular Biology, Genetics, Biochemistry and Computer aided drug designing.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1	Introduction and basics of R	What is R? History of R Features of R Uses of R Applications of R Data types Escape Sequences Variables Keywords Operators Control statements and loops	2
	Data Structures	Vectors Lists Arrays Matrix Data Frames	2

		Factors	
2	Data and File Handling	Reading and writing data R CSV file R Excel file R XML file R Database	2
3	R Statistics	R Mean, Median & Mode R Linear Regression R Normal Distribution R Binomial Distribution R Time Series Analysis R Random Forest R Chi Square Test Support with the machine Neural network Nearest neighbor	5
	R Graphics	R Plot, R Line, R Pie Chart, R Bars	2
4	R applications in Biotechnology	Use various R functions to solve biological problems	2
Total Number of Lectures			15

METHODOLOGY:

The course will be covered through lectures supported by tutorials and practicals. In tutorials, apart from the discussion on the topics covered in lectures, assignments in the form of questions will be given. Normally a student is expected to complete the assignment by himself, however if needed, difficulties will be discussed in the tutorial classes. There will be two class tests/ and surprise test conducted during the tutorial classes.

EXAMINATION SCHEME (THEORY)

Examination	Duration	Marks
Internal*		20
End Semester Exam		30
Total		50

*Average of Internal I (15 marks) and Internal II (15 marks)

REFERENCES:

1. Thulin, M. (2024). Modern Statistics with R: From wrangling and exploring data to inference and predictive modelling. CRC Press
2. Wickham, H., Çetinkaya-Rundel, M., & Grolemund, G. (2023). R for data science. " O'Reilly Media, Inc."
3. Weinberg, S. L., Harel, D., & Abramowitz, S. K. (2023). Statistics using R: an integrative approach. Cambridge University Press.

4. Kabacoff, R. (2022). R in action: data analysis and graphics with R and Tidyverse. Simon and Schuster
5. Wimberly, M. C. (2023). Geographic Data Science with R: Visualizing and Analyzing Environmental Change. Chapman and Hall/CRC.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BI501.1	3	2	2	-	-	2	-	-	2	2	-	3	2	1	-
BI501.2	3	2	2	-	-	2	-	-	2	2	-	3	2	2	1
BI501.3	3	3	3	-	-	3	-	-	3	3	-	3	2	2	2
BI501.4	2	2	2	1	3	2	-	1	2	2	2	2	2	2	3

Elective I

COURSE: BIOPHARMACEUTICALS

COURSE CODE: BT505

MARKS: 150 (Theory 100+Practical 50)

L T P H C

3 0 2 5 4

OBJECTIVE :

To create general understanding regarding basic knowledge of Biopharmaceuticals to familiarize the student with the production techniques, mode of action and therapeutic uses of Biopharmaceuticals.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT505.1	Explain the scientific methods and protocols used for the discovery and development of biopharmaceuticals
BT505.2	Acquire knowledge of good manufacturing practices and recognise their importance in the formulation of biopharmaceutical products
BT505.3	Explain the uses of recombinant DNA and hybridoma technology in the discovery and development of biopharmaceuticals
BT505.4	Demonstrate the significance of blood products and enzymes in biopharmaceuticals
BT505.5	Explain the wound healing process and significance of various growth factors in the process
BT505.6	Apply the knowledge of gene therapy and antisense technology in the production of biopharmaceuticals, and explain the production of monoclonal antibodies, vaccines and biosimilars

PREREQUISITES

Students should know the basics of Microbiology, Biochemistry

COURSE DESCRIPTION

Unit	Topics	Detailed syllabus	No. of Lectures
1	Overview	Introduction and current status of Biopharmaceuticals in the pharmaceutical industry. How are Biopharmaceuticals different from Pharmaceutical products	03
2	The drug manufacturing process	Good Manufacturing Practices: Cleanroom, cleaning, documentation and sanitation (CDS), preparation of purified water and water for injection for the biopharmaceutical processing, Source of Biopharmaceuticals: <i>E.coli</i> as a source of recombinant, transgenic animals, and transgenic plants Analysis of final biopharmaceutical products: Detection of protein based product impurities, pyrogen detection, endotoxin assay, and immunological approaches	09
3	Hormones of therapeutically interest	Insulin, Insulin receptors, production of human insulin by rDNA technology, insulin formulation, and Glucagon	07

4	Blood products and therapeutic enzymes	Anticoagulants: Hirudin, Vitamin K, and Antimetabolites, Oxygen carrying blood substitutes: Albumin, Dextran, and Gelatin	06
5	Growth factors and wound healing	Insulin growth factor (IGF), Epidermal growth factor (EGF), and Platelet derived growth factor (PDGF), Wound healing process	07
6	Vaccines and Nucleic acids therapeutics	Vaccines: Types of vaccines, peptide vaccine, and vaccine vectors Basic approach to gene therapy: Types of gene therapy vectors Antisense technology: Uses, advantages, and limitations	09
Total Number of Lectures			40

METHODOLOGY

The course would be taught through lectures, demonstrations and practicals.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	45 minutes	15
II Internal	45 minutes	15
Teachers assessment		10
End Semester Exam	2 hours 30 minutes	60
Total		100

PRACTICALS IN BIOPHARMACEUTICALS (2 Hrs. Per Week) MARKS: 50

List of Practicals:

1. Chemical assay for estimation of penicillin /streptomycin/tetracycline Antibiotics
2. Bioassay to determine the antifungal activity of standard Aureofungin/ clotrimazole/ fluconazole/
3. Bioassay to determine the antibacterial activity of standard penicillin, streptomycin, tetracycline antibiotics by standard disc/well method
4. Sterility testing of commercial injectable such as saline water, eye drops or ear drops
5. Extraction and detection of antimicrobial compounds from plant origin
6. Determination of glucose in serum/plasma by GOD/POD method
7. Determination of endotoxin in the therapeutic formulation (WFI, gentamycin injection ampicillin injections) by using LAL test reagent
8. Determination of SGPT/SGOT activity in serum / plasma sample by chemical method
9. LIMIT test for chloride, sulphates, iron and heavy metals in pharmaceutical products.
10. One day industrial visit to a pharmaceutical company

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment	20
End semester examination:	30
Total:	50

REFERENCES:

1. Biopharmaceuticals- Biochemistry and Biotechnology. Second Ed. Garry Walsh. John Wiley and Sons. 2003

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 505.1	2	1	1	-	-	1	1	1	1	2	1	1	2	1	1
BT 505.2	2	2	2	1	1	2	3	3	1	2	2	3	2	2	3
BT 505.3	3	2	3	2	2	2	1	1	1	3	3	3	3	2	3
BT 505.4	3	3	3	1	1	2	1	2	1	3	2	3	3	2	3
BT 505.5	3	2	1	1	1	2	1	2	1	3	2	3	3	2	3
BT 505.6	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3

Elective I**COURSE: CLINICAL RESEARCH****COURSE CODE: BT506****MARKS: 150 (Theory 100+Practical 50)****L T P H C****3 0 2 5 4****OBJECTIVE**

The objective of the course is to familiarize the students about higher educational areas after their graduation. At the end of the course students should be able to understand various disciplines in the field of clinical research which will also help them in selecting their dissertation topics in final year of their course.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT506.1	Outline the importance of various clinical research phases and ethical guidelines related to clinical trials
BT506.2	Explain the different steps involved in clinical trials
BT506.3	Perform unbiased data monitoring and analysis as per good clinical practice
BT506.4	Assess adverse events and health-related quality of life in clinical trials
BT506.5	Determine the trial completion, implication, follow-up, reporting, and new drug application procedures
BT506.6	Acquire awareness about the current situation of clinical research including updated regulations in India and the future of clinical research

PREREQUISITE:

Students should be familiar with biology and basic statistics to take up this course.

COURSE DESCRIPTION

Unit	Topic	Detailed syllabus	No. of Lectures
1	Introduction to clinical trials	History & background of origin of clinical research; Drug development process and phases of clinical trials (CT); Terminology in clinical research	3
	Introduction to different clinical guidelines and ethics	Ethics in clinical research; Introduction to different clinical guidelines (Schedule Y, DGCI, ICMR, ICH-GCP); Principles of ICH-GCP, US Food and Drug Administration (USFDA); Medicines and Healthcare Products Regulatory Agency (MHRA): Overview, European Agency for Evaluation of Medicinal Products (EMA), Ethical guidelines for biomedical research on human participants (as given in ICMR); Indian Good Clinical Practices; Clinical trial application requirements (IND, NDA, ANDA, orphan drugs);	5

		Informed consent; Ethical committee (EC)-constitution; Roles & responsibilities; Communication with EC	
2	Design of the study	Planning a protocol: an overview; Selection of questions, Defining the study population; Types of study design; Response variables and measurement; Bias and elimination of bias - Types and mechanics of randomization; Types of blinding in trials and methods of protecting blind design	8
	Initiation of recruitment	Sample size calculation; Recruiting participants; Baseline assessment	3
3.	Clinical data monitoring and analysis	Case report form (CRF); CRF Tracking, Data entry processing; Data validation and discrepancy management; Quality monitoring of the data; Minimizing poor quality data; Data analysis; Competing events; Co-variance adjustment; Subgroup analysis; Cut-points; Meta-analysis	7
4.	Impact analysis	Adverse effect; Health related quality of life; adherence and survival analysis	5
5.	Termination and reporting	Closeout- Termination of the trial; Procedure of termination; Post study follow up; Evaluation of the trial; Reporting a trial; Interpretation and publication bias; Comparing results between studies, clinical implication of the findings, Multicenter trials, Globalization of trials, Drug approval- Indian scenario and US FDA, EU	9
6.	Other components of clinical research	Medical writing; Pharmacoepidemiology; Pharmacovigilance; B.A./B.E. Studies; Overview of the on-going clinical trials in India	5
Total no. of Lectures			45

METHODOLOGY

The course will be covered through lectures and demonstrations.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	1 hour	20
II Internal	45 mins	15
Attendance	---	5
End Semester Exam	2 hours 30 mins	60
Total		100

PRACTICAL IN CLINICAL RESEARCH**(2 Hrs. Per Week) MARKS: 50****List of Practicals:**

1. Drafting of Informed Consent Form/Assent Form-
2. Drafting of CRF
3. Visit to clinical research setting (Industrial/Hospital based)

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

REFERENCES:

1. Dyer, R. K. R., & McFarlane, B. E. K. (2022). *Clinical research: A textbook for health professionals*. Wiley-Blackwell.
2. Fundamentals of clinical trials, by Friedman, LM; Furberg, CD; Demets, DL; 2015. ISBN 978-1-4419-1585-6, Publisher Springer
3. Bellary S, Krishnankutty B, Latha MS. Basics of case report form designing in clinical research. *Perspect Clin Res*. 2014;5(4):159-166. doi:10.4103/2229-3485.140555
4. Clinical Trials Handbook: Design and Conduct, Cutis L. Meinert, ISBN 978-1-1182-1846-4, Publisher Wiley

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 506.1	3	3	3	-	-	3	3	3	2	1	1	3	1	1	3
BT 506.2	3	3	3	-	-	3	3	3	3	3	3	3	3	3	3
BT 506.3	3	3	3	3	3	3	1	3	2	3	3	3	3	3	2
BT 506.4	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3
BT 506.5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
BT 506.6	2	3	3	2	2	3	3	3	3	3	3	3	3	3	3

Elective I**COURSE: HUMAN DISEASES AND PATHOBIOLOGY****COURSE CODE: BT507****MARKS: 150 (Theory 100+Practical 50)****L T P H C****3 0 2 5 4****OBJECTIVE**

The objective of the course is to develop an understanding regarding various human diseases. The course covers details of various infectious and non-infectious diseases.

COURSE OUTCOME:

On completion of the course would enable the student to understand various human diseases.

CO No.	At the end of the course, the learner should be able to:
BT507.1	Outline the characteristics of diseases and identify types of laboratories for disease investigation
BT507.2	Illustrate various human pathogens and explain the effect of microbial virulence factors
BT507.3	Describe the prevention and treatment of infectious diseases
BT507.4	Discuss the disorders of endocrine and immune systems including autoimmune disorders
BT507.5	Comprehend signs, symptoms, diagnosis, and treatment of digestive and cardiovascular disorders
BT507.6	Identify diseases associated with aging, and examine the importance of disease management

PREREQUISITES

Since the course is advance in nature knowledge in microbiology, human anatomy and physiology is required.

COURSE DESCRIPTION

Unit	Topics	Detailed syllabus	No. of Lectures
1.	Introduction to nature and investigation of diseases	Introduction to health and disease Characteristics and features of diseases Classification of disease Epidemiology Investigating diseases: Types of pathology laboratories, role and evaluation of hospital laboratory tests.	7
2.	Pathogens and virulence	Introduction to pathogens, parasites and types of infection Types of pathogens : Bacteria, Fungi, Helminths, Prions, Protozoans and Viruses Types and effects of microbial virulence factors (offensive and defensive).	6

3.	Infectious disease and treatments	Bacterial infections of skin, eye, ear, central nervous system, respiratory system urogenital system and gastrointestinal system Viral infections of central nervous system, respiratory system, urogenital system and gastrointestinal system Fungal infections of skin and respiratory system Systemic infections, Sepsis, Prevention and treatment of infections (with antibiotics, antiviral combination therapy and surgery)	6
4	Disorders of immune system	Introduction to the defense system and types of immunodeficiency diseases Signs, symptoms, diagnosis and treatments of i) Primary immunodeficiency diseases : SCID, CVID, Transient hypogammaglobulinemia, DiGeorge Anomaly and Wiskott-Aldrich Syndrome ii) Autoimmune Disorders: Rheumatoid Arthritis, Systemic Lupus Erythematosus and Myasthenia Gravis iii) Immunological Hypersensitivities: Type I to IV	6
	Disorders of the endocrine system	Introduction to endocrine system and its disorders. Signs, symptoms, diagnosis and treatments of disorders linked to a) Growth hormones : Acromegaly, Gigantism b) Thyroid Glands: Hypothyroidism and Hyperthyroidism c) Adrenal Glands: Addison disorder and Cushing syndrome d) Pancreas: Diabetes Mellitus e) Reproductive hormones : i) Male: Hypogonadism, Gynecomastia ii) Female: Amenorrhea and PCOS Causes and treatment of infertility in men and women	6
5	Disorders of digestive system	Introduction to GIT and common disorders eg: Gastritis, Ulcers Signs, symptoms, diagnosis and treatments of Cholelithiasis, Hepatitis , Hernia, and Crohn disease	5
	Disorders of the cardiovascular system	Introduction to the circulatory system and common disorders eg: hypertension, cardiac failure and angina Signs, symptoms, diagnosis and treatments of dilated congestive cardiomyopathies, endocarditis and atherosclerosis	5
6	Disorders linked to aging	Introduction to causes of aging, age-related disorders eg: Parkinson disorder, Alzheimer disorder and Progeria	3
	Disease surveillance	History and importance of surveillance in disease management	2
Total No. of Lectures			46

METHODOLOGY

The course would be covered through lectures, group discussions, teaching aids and would be supported by practical.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	60 mins	20
II Internal	45 mins	15
Attendance	----	5
End Semester Exam	2 hours 30 mins	60
Total		100

PRACTICAL IN HUMAN DISEASES AND PATHOBIOLOGY (2 Hrs. Per Week) MARKS: 50**List of Practicals:**

1. Introduction to pathogens/parasites (e.g., bacteria, protozoans, arthropods etc.) including disease causing stages in their life cycle using permanent slide preparations/images.
2. Identification of microbes\$ using indicator media (e.g., Blood Agar).
3. Common and rare skin diseases/disorders in a population (based on the cases in the outpatient unit of Department of Dermatology, DPU Medical College and Hospital)#.
4. Metabolic and immune disorders in a population (based on the cases in the outpatient unit of Departments of Pathology and General Medicine, DPU Medical College and Hospital)#.
5. Sexually transmitted diseases in a population (based on the cases in the outpatient unit of Department of Venereology, DPU Medical College and Hospital)#.
6. Clinical methods (eg: X-ray, CT scan etc.) used in diagnosis of common diseases (at the Departments of Radio-diagnosis, Pathology and Microbiology, DPU Medical College and Hospital)#.
7. Study the implications of viral infections in the context of biomedical research (by visiting a research organization) #.

\$ Non-pathogenic strains would be used for the experiment.

Students are to take note on the practical carried out and the observations made during visit to the Medical College and Hospital or other research institutes/centers. Practical examination would involve questions based on what has been studied/demonstrated in these visits.

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment	20
End semester examination:	30
Total:	50

REFERENCES:

1. Biology of Disease, by Nessar Ahmed, Maureen Dawson, Chris Smith, Ed Wood, **Publisher:** Taylor & Francis; **ISBN-13:** 978-0748772100
2. Gordis, L. (2004). *Epidemiology*. Third edition. Philadelphia: Elsevier Saunders. (The second edition is also acceptable.)

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 507.1	2	2	2	-	1	1	1	-	1	-	1	1	2	-	-
BT 507.2	2	2	2	-	-	1	-	-	-	-	1	1	2	-	-
BT 507.3	2	2	2	1	1	1	-	-	-	-	1	1	2	-	-
BT 507.4	2	2	2	1	1	1	-	-	-	-	1	1	2	2	-
BT 507.5	2	2	2	1	1	1	-	-	-	-	1	1	2	2	-
BT 507.6	2	2	2	2	1	1	-	1	-	-	1	1	2	2	-

COURSE: SCIENCE COMMUNICATION**COURSE CODE: BTSEC501****MARKS: 50 (Theory 50)****L T P H C****0 0 2 2 1****OBJECTIVES OF THE COURSE:**

- To train the students for communicating science in simple language
- To understand and present a particular topic, published research work in front of an audience
- To develop capability and potential to discuss, delineate a topic precisely, professionally in an interactive manner
- To prepare science columns, science videos, science animations for effective public outreach
- To prepare science blogs

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BTSEC501.1	Comprehend scientific articles and communications
BTSEC501.2	Communicate science to public in simple ways through articles, cartoons, blogs
BTSEC501.3	Communicate science to public in simple ways through animations, videos,
BTSEC501.4	Relate ethics in Science communication

PRACTICAL IN SCIENCE COMMUNICATION (2 Hrs. Per Week) MARKS: 50**List of Practicals:**

1. Modes of Professional Scientific Communication
2. Structure of research article
3. Interpreting the scientific data and writing a popular science article
4. Interpreting the scientific data and writing a blog
5. Interpreting the scientific data and making a science animation
6. Interpreting the scientific data and making a science video
7. Ethical practices in science communication

Sr no.	Practical / Workshop	Hrs
1	Modes of Professional Scientific Communication	02
2	Structure of research article	02
3	Interpreting the scientific data and writing a popular science article	04
4	Interpreting the scientific data and writing a blog	04
5	Interpreting the scientific data and making a science animation	08
6	Interpreting the scientific data and making a science video	08
7	Ethical practices in science communication	02
	Total	30

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Continuous Internal Assessment		
Attendance		20
Presentations/Report/Video/Blog/Article/Animation		30
Total		50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BTSEC501.1	1	1	-	-	-	2	-	-	1	3	-	1	1	-	-
BTSEC501.2	1	1	-	-	2	2	-	1	2	3	-	1	1	-	-
BTSEC501.3	1	1	-	-	2	2	-	1	2	3	-	1	1	-	-
BTSEC501.4	1	1	-	-	-	2	-	3	1	1	-	1	1	-	-

COURSE: APTITUDE BUILDING-V**COURSE CODE: BTAEC501****L T P H C****MARKS: 50 (Theory 50)****0 0 2 2 1****OBJECTIVE**

1. To enhance the logical reasoning skills of the students and help them improve the problem-solving abilities
2. To acquire skills required to solve quantitative aptitude problems
3. To boost the verbal ability of the students for academic and professional purposes

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BTAEC501.1	Apply critical thinking skills, such as problem solving related to their subject matter
BTAEC501.2	Demonstrate competency in verbal, quantitative and reasoning aptitude
BTAEC501.3	Display good written skills for use in academic and professional scenarios
BTAEC501.4	Develop technical skills

PREREQUISITE:

Students should be familiar with basic scientific concepts to take up this course.

COURSE DESCRIPTION**PRACTICAL IN APTITUDE BUILDING-V****(2 Hrs. Per Week) MARKS: 50**

Sr no.	Practical/Training/Tests/Interviews	Hrs
1	Essential Grammar	02
2	Vocabulary for placements	04
3	Verbal Ability	08
4	Presentation & Writing skills for placements	04
5	Quality and regulatory documentation	02
6	Bioreactor design and process optimization	02

7	Enzyme-based sensors	02
8	Competitive Examination Preparation	02
9	Mock Interviews	02
10	Discussion session-Industry Experts/Academia Experts/Alumni	02
	TOTAL	30

METHODOLOGY

The course will be covered through Lectures/Assignments/Practical/Training/Tests/Interviews

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Continuous Internal Assessment		20
Attendance		
Assignments/Practical/Training/Tests/Interviews		30
Total		50

BOOKS RECOMMENDED:

1. R. S. Aggarwal, (2017). Quantitative Aptitude for Competitive Examinations, 3rd (Ed.). New Delhi: S. Chand Publishing
2. ETHNUS, (2016). Aptimithra, 1st (Ed.). Bangalore: McGraw-Hill Education Pvt. Ltd.
3. Arun Sharma, (2016). Quantitative Aptitude, 7th (Ed.). Noida: McGraw Hill Education Pvt. Ltd.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BTAEC501.1	-	2	2	1	2	-	-	-	-	1	-	2	2	-	-
BTAEC501.2	1	1	1	-	-	-	-	-	-	1	-	1	1	-	-
BTAEC501.3	1	1	1	-	2	-	-	-	-	2	-	1	1	-	-
BTAEC501.4	1	1	1	-	1	-	-	-	-	1	-	1	1	-	-

SEMESTER VI						
Course Code	Course Name	L	T	P	Hr	Cr
BT601	Food Biotechnology	2	0	2	4	3
BT602	Marine Biotechnology	2	0	0	2	2
BT603	Basic Pharmacology & Toxicology	2	0	0	2	2
BT604	Genomics, Transcriptomics and Proteomics	3	0	4	7	5
BI601	Artificial Intelligence	1	0	2	3	2
BT605/BT606	Elective II BT605 Perl & Bioperl BT606 Structural Biology	3	0	2	5	4
BTIKS601	Indian Constitution and Law	1	0	0	1	1
BTSEC 601	Foreign Language Course German/French/Japanese/Korean/Spanish/ any other (online MOOCs/offline)	2	0	0	2	2
BTAEC 601	Aptitude Building-VI	0	0	2	2	1
Total		16	0	12	28	22

COURSE: FOOD BIOTECHNOLOGY**COURSE CODE: BT601****MARKS: 100 (Theory 50+Practical 50)**
L T P H C
2 0 2 4 3
OBJECTIVE:

The objective of the course is to familiarize the students with quality process used in food industry and basic concept in Food Biotechnology

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT601.1	Comprehend the technical terms and skills involved in food science
BT601.2	Classify and categorize various biomolecules present in food
BT601.3	Demonstrate various processing methods in food industry
BT601.4	Demonstrate the role of microbes in fermented food products
BT601.5	Describe various approaches including cloning and genetic engineering for the production of genetically modified and superior quality foods
BT601.6	Analyse and evaluate food products in terms of nutrition, adulteration, and overall quality as per the National and International standards

PREREQUISITES:

Since the course is application oriented, student must know about the basics of Biomolecules, Microbiology and Fermentation technology.

COURSE DESCRIPTION

Sr No	Topic	Detail Syllabus	No. of Lectures
1	Introduction to Food Biotechnology	Activities of Food Biotechnologist, Career in Food Biotechnology.	1
2	Nutritive aspects of Food Constituents	Food and Energy, Role of Carbohydrate, Proteins, and Fats in Nutrition. Bioavailability of Nutrients, Role of Vitamins, Minerals, Fiber and Water. Stability of Nutrients	3
3	Biotechnology in Food Processing	Unit Operation in Food Processing Quality Factors in Food Food deterioration Food Preservation and its Principle Rheology of Food in general.	6

4	Role of Microbes in Food and Food Products	Fermentation and other uses of Microorganism, Single Cell Proteins. Production of Pickle, Kefir, Wine, Beer, Bread, Monosodium Glutamate (MSG). Production of Cheese and Types of Cheese. Use of enzymes in food industry - Proteases, Glucose oxidase, Amylase.	10
5	Molecular cloning in Food Industry and Other technique to develop new plant varieties	Antisense RNA technology (Flavr Savr Tomatoes), Enviro Pig, Daisy Cow, Golden Rice, BT Brinjal. Agrobacterium mediated gene transformation, Somaclonal Variation, Gametoclonal Variation. Ethical Issues related to use of Genetically modified foods.	8
6	Food Laws and Standards	Prevention of Food Adulteration Act, FSSAI and its function, International Food Standards- FAO, WHO and CODEX Alimentarius. Hazard Analysis Critical Control Point (HACCP). Food Labeling and Nutrition Labeling. Quality Control in Food.	2
Total Number of Lectures			30

METHODOLOGY

The course would be taught through lectures, demonstrations and practical.

Evaluation Scheme (Theory)

Examination	Duration	Marks
Internal*	45Mins	15
Teachers assessment	-	05
End Semester Exam	1 hrs 15 mins	30
Total		50

*Average of Internal I (15 marks) and Internal II (15 marks)

PRACTICAL IN FOOD BIOTECHNOLOGY (2 Hrs. per Week) MARKS: 50
List of Practicals:

1. Determination of quality of milk by MBRT test.
2. To Detect the number of bacteria in milk or any given sample by Breed Count or Direct Microscopic Count (DMC).
3. To check the efficiency of food preservatives.
4. Estimation of Percentage of lactic acid (Titrable acidity) in given milk and milk product sample using titration method.
5. Detection of pathogenic bacteria from food sample using selective media.
6. To Detect the number of bacteria in food sample by Standard Plate Count (SPC) Method.
7. To make/bake bread using *Saccharomyces cerevisiae* (Baker's yeast).
8. To make Cheese in Laboratory

PRACTICAL EVALUATION SCHEME:

Examination	Marks
Internal (Continuous) Assessment	20
End semester Exam Viva & Spotting	30
Total	50

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 601.1	1	1	1	1	-	-	1	-	1	2	-	1	1	3	1
BT 601.2	3	1	2	1	-	3	1	2	1	2	-	3	2	3	2
BT 601.3	3	3	3	2	2	3	2	2	2	2	3	3	2	3	2
BT 601.4	3	3	3	3	2	3	2	2	2	2	3	3	2	3	2
BT 601.5	3	3	3	3	3	3	2	3	2	2	2	3	3	3	3
BT 601.6	2	1	3	1	1	3	3	3	2	2	3	3	3	3	3

COURSE: MARINE BIOTECHNOLOGY L T P Hr C

COURSE CODE: BT602 2 0 0 2 2

MARKS: 50(Theory 50)

OBJECTIVE:

The objective of the course is to give an overview of marine environment and its living and nonliving resources. Further the utility of the resources for overall benefit of humans and other biota is also covered.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT602.1	Outline marine ecosystems and their biodiversity to isolate and identify potential marine organisms of biotechnological importance
BT602.2	Demonstrate various marine culture techniques to produce aquatic food, and maintenance of aquatic animal health and broodstock
BT602.3	Practice genetic improvement of fish stocks, develop probing technologies and biosensors
BT602.4	Devise marine models for regenerative medicine and strategies for the conservation of marine resources

PRE-REQUISITES:

Students are expected to have a basic understanding in Biology.

COURSE DESCRIPTION:

Unit	Topics	Detail Syllabus	No. of Lectures
1	Marine Science Fundamentals	<ul style="list-style-type: none"> Bathymetry: Ocean basins, tectonics and sediments Marine biology and ecology: Biodiversity, benthos, food chain, non-cultivable life forms 	3
	Marine Microbiology	<ul style="list-style-type: none"> Methods for assessment of microbial life forms: sampling, identification, community structure analysis Role of Microbes in marine ecosystem: beneficial and harmful effects, interactions with other flora and fauna 	4

	Marine resources- Bioprospecting	<ul style="list-style-type: none"> • Marine Natural Products: screening using advanced high- throughput systems, isolation and identification techniques using genomics, proteomics or transcriptomics approaches • Bioactive compounds and Biomaterials: antibiotics, enzymes, alkaloids, biominerals, biocomposites, • Biopolymers 	6
2	Marine culture	<ul style="list-style-type: none"> • Aquaculture: Methods, ponds, cultivation systems, examples- Gastropod, Bivalve and Crustacean production • Marine life poisoning: marine toxins • Aquatic animal health management: diseases of commercial fishes, spoilage, control methods • Broodstock development: Maintenance of important broodstock 	7
3	Advanced technologies and products	<ul style="list-style-type: none"> • Transgenic fish: development and applications • Probing technologies: biochemical, molecular, bioindicators • Biosensors: role in marine environment 	5
4	Marine models of regenerative medicine	<ul style="list-style-type: none"> • Principles of organ regeneration: Xenopus and Zebrafish as models for regeneration • Examples of marine biomaterials in regeneration 	3
	Marine Conservation	<ul style="list-style-type: none"> • Pollution in the marine environment: Causes • Marine protection acts and laws: for conservation 	2
Total			30

METHODOLOGY:

The course will be covered through lectures and laboratory practicals. Students will be evaluated based on two class tests, lecture and laboratory attendance, class participation.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Internal*	45 minutes	15
Attendance		5
End Semester Exam	1 hours 15 minutes	30
Total		50

*Average of Internal I (15 marks) and Internal II (15 marks)

REFERENCES:

1. Marine Biotechnology I, Le Gal, Yves, Ulber, Roland (Eds.), Springer (2005).
2. Marine Biotechnology II, Le Gal, Yves, Ulber, Roland (Eds.), Springer (2005).
3. Handbook of Marine Biotechnology, Kim, Se-Kwon (Ed.), Springer (2015).
4. Micro Algae: Biotechnology & Microbiology, E. W. Becker Cambridge University Press.
5. Aqua Culture – An Introduction, Lee & Newman, Interstate Publishers Biotechnology an Introduction, Susan R. Barnum, Vikas Publishing House

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 602.1	2	3	3	2	3	3	2	1	2	2	3	2	3	2	3
BT 602.2	3	3	2	2	3	3	2	2	2	1	2	3	3	3	3
BT 602.3	2	2	3	3	2	3	3	2	2	3	2	2	3	2	3
BT 602.4	3	3	3	3	2	2	3	3	2	3	3	2	2	3	3

COURSE: BASIC PHARMACOLOGY & TOXICOLOGY**COURSE CODE: BT603****MARKS: 50 (Theory 50)****L T P H C****2 0 0 2 2****OBJECTIVE :**

The objective of the course is to familiarize the students with basic aspects of Pharmacology and toxicology.

COURSE OUTCOMES:

CO No.	At the end of the course, the learner should be able to:
BT603.1	Comprehend the importance of dose-effect relationship in pharmacology and toxicology
BT603.2	Explain the pharmacokinetics of xenobiotics with special reference to metabolism
BT603.3	Analyse various chemical interactions and their importance in toxicity testing
BT603.4	Illustrate molecular basis of interactions of various receptors with their chemical ligands

PREREQUISITES:

Students should studied chemistry and cell biology

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1	Introduction to pharmacology and toxicology	1. History and scope 2. Definitions and terms	3
	Dose-effect relationships	1. Assumptions in deriving the Dose: Response relationship 2. Individual, graded and quantal Dose: Response relationship 3. Evaluating Dose: Response relationship: Therapeutic, Lethal effective dosage. 4. Dose-Response Assessment: NOAEL	6
2	Pharmacokinetic	1. Route and site of exposure: oral, dermal, inhalation and injection 2. Absorption 3. Distribution	4

		4. Metabolism 5. Excretion	
	Biotransformation of Xenobiotics	1. Biotransformation versus metabolism 2. Phase I and Phase II enzymes and reactions	6
3	Interaction of chemicals	1. Potentiation, 2. Agonism and Antagonism, 3. Synergistic	3
	Toxicity testing	1. <i>In vitro</i> and <i>in vivo</i> tests Acute, sub-chronic, chronic, Mutagenicity and carcinogenicity 2. Special Tests	7
4	Response to different chemicals	1. Receptor classification 2. Drug receptor interaction Ligand-gated ion channel, G-protein coupled receptors, Kinase and enzyme linked and nuclear receptors.	6
Total Number of lectures			32

METHODOLOGY: The course will be covered through lectures and laboratory practical's. Students will be evaluated based on two class tests, lecture and laboratory attendance, class participation.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	----	20
II Internal		
End Semester Exam	1 hour 15 minutes	30
Total		50

BOOKS RECOMMENDED:

- 1) Toxicology: The Basic Science of Poisons, Casarett and Doull's: Amdur, Mary O. PhD; Doull, John PhD, MD; Klaassen, Curtis D. PhD MC Graw Hill Publisher 7th Edition.
- 2) A text book of toxicology Ernest Hodgson A JOHN WILEY & SONS, INC., PUBLICATION, 4th edition
- 3) Lippincott's Illustrated Reviews: Pharmacology, 5th edition, Richard A. Harvey. Publisher- Lippincott Williams & Wilkins, a Wolters Kluwer Business.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 603.1	2	2	1	-	-	1	-	-	2	1	-	2	2	2	-
BT 603.2	1	1	1	-	-	2	1	-	2	2	-	2	2	2	-
BT 603.3	2	2	1	1	2	2	1	2	2	1	2	3	3	3	-
BT 603.4	2	3	3	3	-	2	2	2	2	2	2	3	3	3	2

COURSE: GENOMICS TRANSCRIPTOMICS & PROTEOMICS**COURSE CODE: BT604****L T P H C****Total marks: 200 (Theory 100+Practical 100)****3 0 4 7 5****OBJECTIVES:**

The recent proliferation of genomic data has transformed biology, making previously laborious and expensive experiments easier and cheaper, enabling new avenues of inquiry, and fundamentally altering our understanding of biology and medicine. This course will introduce to the questions that can be asked and answered with genomic data, and to the computational tools available to analyze that data.

COURSE OUTCOME

CO No.	At the end of the course, the learner should be able to:
BT604.1	Outline the genome organization and various tools used for genome analysis
BT604.2	Demonstrate the concept of transcriptome and the tools involved in its analysis
BT604.3	Employ microarray and various sequencing techniques including NGS for genomic and transcriptomic studies
BT604.4	Illustrate the concept and tools for analysing proteome of organisms
BT604.5	Elucidate the principles and usage of tools for studies in metabolomics
BT604.6	Planning and implementation of advanced techniques including mass spectrometry, GCMS etc. for protein and metabolite identification

PREREQUISITE

Basic knowledge of molecular biology, Recombinant DNA technology and Bioinformatics is required.

COURSE DESCRIPTION

Unit	Topics	Detail Syllabus	No. of Lectures
1.	Genomics	Structure and organization of prokaryotic and eukaryotic genomes- nuclear, mitochondrial and chloroplast genomes.	4

		Databases different types DNA databases, Tools for finding genes and regulatory regions.	
2.	Transcriptomics	Concepts of transcriptomics and its scope.	2
		Micro (mi) RNA biogenesis and its role in regulation of gene expression.	1
		Tools for analyzing gene expression: Serial Analysis of gene expression (SAGE), massively parallel signature sequencing (MPSS).	4
3	Microarray technique in Genomics and Transcriptomics	Basic principles and design of cDNA and oligonucleotide arrays, DNA microarray. Basic steps involved in designing a microarray experiment.	3
		Types of microarray based on its applications:- Expression arrays, Comparative Genomic Hybridization (CGH) arrays, Re-sequencing arrays.	3
		Different microarray platforms (Affymetrix, Agilent etc.); Tools used to normalize microarray Data.	1
		Microarray databases – NCBI; GEO (Gene Expression Omnibus), Array Express (EBI);	2
		Functional Analysis: Gene Ontology functional enrichment tools, Pathway analysis (KEGG Database)	3
	Sequencing technology in Genomics and transcriptomics	Next Generation sequencing (NGS): Introduction to NGS, overview and comparison of different Sequencing Platform (Illumina, 454 (Roche), SOLiD (Life technology), Specific Biosciences, Ion Torrent, Nanopore, PacBio.	4
Types of NGS	DNA-sequencing (Whole genome sequencing), exome sequencing, Deep sequencing, ChIP sequencing, RNA-sequencing (Whole transcriptome sequencing, WTS).	2	
4	Proteomics:	What is proteomics?; proteome complexity; Overview of protein structure-primary, secondary, tertiary and quaternary structure. , Clinical and biomedical applications of proteomics.	2
		Post translational Modifications (PTMs): Different type of PTMs, Quantitative proteomics, clinical proteomics and disease biomarkers, mass spectral tissue imaging and profiling	3
		Bioinformatics tools in Proteomics: Protein database, Relationship between protein structure and function.Track emrging diseases and design new drugs	4
5	Metabolomics	An overview, basic sample preparation strategies-extraction, derivatization. Workflow for lipidomics;	4

		Targeted Vs Untargeted metabolomics; development of targeted assays for small molecules, Metabolomic Data Analysis: Peak detection, retention time alignment; identification of molecular features and metabolites; Structural confirmation of metabolites. Software- Multiquant, MZmine, XCMS, MarkerView,	
6.	Techniques in Protein and Metabolite Identification	Identification and analysis of proteins by 2D PAGE, Mass spectrometry: ion source (MALDI, spray sources), analyzer (ToF, quadrupole, quadruple ion trap) and detector for protein and metabolite analysis	3
Total no. of Lectures			45

METHODOLOGY:

The course will be covered through lectures supported by tutorials and practicals. In tutorials, apart from the discussion on the topics covered in lectures, assignments in the form of questions will be given.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	1 hour	20
II Internal	45 mins	15
Attendance	---	5
End Semester Exam	2 hours 30 mins	60
Total		100

PRACTICAL IN GENEOMICS, TRANSCRIPTOMICS & PROTEOMICS (4 HRS) 100 MARKS**List of Practicals:**

1. To determine genome size & genome complexity by Cot curve analysis
2. To perform zoo blotting.
3. Analyze microarray & RNA seq data
4. To carry out quantitative real time PCR (qRT-PCR)
5. To Isolate and analyse microRNA using polyacrylamide gel or PCR
6. To predict possible microRNAs targeting the gene of interest.
7. To Perform DNA sequencing
8. To Perform 2D gel electrophoresis & identification of the protein/peptide by MALDI
9. To carry out DNA sequence analysis from the available profile.
10. Genome Databases.

PRACTICAL EVALUATION SCHEME

Examination	Marks
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SYLLABUS FOR B. TECH. BIOTECHNOLOGY

Practical Internal (Continuous) assessment:	40
End semester examination:	60
Total:	100

REFERENCES:

1. Principles of gene manipulation and Genomics Primrose S.B. and RM Twyman R.M. ed VII, 2006
2. Introduction to Genomics, Arthur M Lesk II nd edition Oxford University Press. 2012
3. Introduction to Proteomics: Tools for New Biology Daniel C Liebler 1st Edition New York Humana Press, 2001
4. Bioinformatics Sequence and Genome Analysis D.W Mount Cold Spring Harbour Laboratories (CSHL) 2004
5. Discovering Genomics, Proteomics and Bioinformatic A. Malcolm Campbell , Laurie J. Heyer Benjamin Cummings; 2 edition (2006)
6. http://www.targetscan.org/vert_71
7. <http://mirdb.org>
8. <http://www.exiqon.com/microrna-target-prediction>.
9. www.nanoporetechnologies.com
10. <http://plantta.jcvi.org/>
11. www.flymine.org/
12. www.ncbi.nlm.nih.gov/genbank/
13. <https://www.ebi.ac.uk/embl/>
14. www.ddbj.nig.ac.jp/

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 604.1	1	3	3	3	3	2	1	-	1	2	-	3	2	2	-
BT 604.2	1	3	3	3	3	2	1	-	1	2	-	3	2	2	-
BT 604.3	1	3	3	3	3	2	1	1	2	2	2	3	2	2	-
BT 604.4	1	3	3	3	3	2	1	-	1	2	-	3	2	2	-
BT 604.5	1	3	3	3	3	2	1	-	1	2	2	3	2	2	-
BT 604.6	1	3	3	3	3	2	1	1	2	2	2	3	2	2	3

COURSE: ARTIFICIAL INTELLIGENCE**COURSE CODE: BI601****MARKS: 100 (Theory 50+Practical 50)****L T P H C****1 0 2 3 2****COURSE OBJECTIVE:**

- This course introduces the concepts and state-of-the-art research in bioinformatics, data mining and AI especially for medical application
- To understand the various characteristics of Intelligent agents
- To learn the different search strategies in AI
- To learn to represent knowledge in solving AI problems
- To understand the different ways of designing software agents
- To know about the various applications of AI

COURSE OUTCOME

CO No.	At the end of the course, the learner should be able to:
BI601.1	Identify and analyse the application areas using AI
BI601.2	Select search algorithms in AI based applications
BI601.3	Employ probabilistic reasoning in AI based applications
BI601.4	Create biological applications using Machine Learning and Deep learning methods

COURSE DESCRIPTION:

Unit	Topics	Detail Syllabus	No. of Lectures

1	Introduction to AI	Introduction to AI, history and scope, Application areas, Heuristic search, Algorithms	2
2	Search Algorithms	Random search, Search with closed and open list, Depth and Breadth first search	2
3	Probabilistic Reasoning	Probability, conditional probability, Bayes Rule, Bayesian Networks	1
4	Introduction to Machine Learning	Supervised & Unsupervised Learning	4
	Introduction to Deep Learning	Neural networks, Computer Vision, Natural Language Processing	3
	Application of AI in Biological Sciences	Case Study	4
Total no. of Lectures			16

METHODOLOGY:

The course will be covered through lectures supported by tutorials and practicals. In tutorials, apart from the discussion on the topics covered in lectures, assignments in the form of questions will be given. Normally a student is expected to complete the assignment by himself, however if needed, difficulties will be discussed in the tutorial classes. There will be two class tests/ and surprise test conducted during the tutorial classes.

EXAMINATION SCHEME (THEORY)

Examination	Duration	Marks
Internal*	45 mins	20
End Semester Exam	1hr and 15 mins	30
Total		50

*Average of Internal I (15 marks) and Internal II (15 marks)

PRACTICALS IN ARTIFICIAL INTELLIGENCE**(2 HRS. PER WEEK)****50 MARKS****List of Practicals:**

1. Basic foundation of Python and acquainted with IDE such as Jupyter Notebook
2. Practical implementation of python libraries such as NumPy, Pandas, and Matplotlib for data manipulation and visualization
3. Basic understanding of Libraries such as Scikit-learn, TensorFlow and Dataset such as Kaggle.
4. Implementation of Linear Regression, K-Means, SVM, Naïve Bayes classifier and Random Forest algorithm (at least two) by using Scikit-learn libraries

Miniproject

5. To build an AI system using convolution neural networks (CNNs) and Python that can detect pneumonia from a patient's X-ray images

6. To build a chatbot using Python
7. To build a recommendation system for customers for products with the help of ANN, data mining, machine learning, and programming

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

BOOKS RECOMMENDED:

- 1) Géron, A. (2022). *Hands-on machine learning with Scikit-Learn, Keras, and TensorFlow*. " O'Reilly Media, Inc."
- 2) Boden, M. A. (2018). *Artificial intelligence: A very short introduction*. Oxford University Press.
- 3) Russell, S. J., & Norvig, P. (2016). *Artificial intelligence: a modern approach*. Pearson
- 4) Poole, D. L., & Mackworth, A. K. (2010). *Artificial Intelligence: foundations of computational agents*. Cambridge University Press.
- 5) Russell, Stuart. "Human-Compatible Artificial Intelligence." (2022): 3-23

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BI 601.1	2	1	1	-	1	1	-	-	2	1	-	2	2	1	-
BI 601.2	2	2	1	1	3	1	-	-	2	1	-	2	2	2	-
BI 601.3	2	2	2	2	3	2	-	-	2	2	-	3	2	2	1
BI 601.4	2	2	2	2	3	3	3	3	2	2	3	3	2	2	2

Elective II**COURSE: PERL & BIOPERL****COURSE CODE: BT605****MARKS: 150 (Theory 100+Practical 50)**

L	T	P	H	C
3	0	2	5	4

OBJECTIVE

The objective of the course is to familiarize the Perl programming concepts

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT605.1	Illustrate the application of Perl in bioinformatics and the use of datatypes, arrays and data lists
BT605.2	Perform repetitive tasks using control structures such as if-else, switch, loops etc.
BT605.3	Apply Hash codes to enhance the program output and learn the syntax for basic input output operations
BT605.4	Illustrate various regular expressions for mining and cleaning biological data
BT605.5	Acquire the skills to write scripts and programs to generate functions using subroutines

BT605.6	Apply various Bioperl modules to perform specific biological tasks like sequence similarity search and sequence alignment
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PREREQUISITES

Students should be familiar with basic concepts of programming.

COURSE DESCRIPTION

Unit	Topics	Detailed syllabus	No. of Lectures
1	Introduction and Installation	Introduction to Perl, Use of Perl in Bioinformatics , History, Availability, Support and Basic Concepts	03
	Scalar Data	Data types, variables, scalars, Number, String, String functions, Comments, Escape sequences, Operators and operator types	04
	Arrays and List Data	Introduction, Literal Representation, Variables Array Operators and Functions, Scalar and List context	04
2	Control Structure	If-else, switch, last, next, for loop, while loop and do-while loop	05
3	Hashes	Hash variables, Literal Representation of hashes, Hash function	05
	Basic I/O	Opening & closing file, reading & writing file, different modes of file.	05
4	Regular Expressions	Use of regular expression, Patterns, Matching operators, Substitution, Split and join functions	05
5	Subroutines	System and user function, The local Operator, Variable length parameter list	03
6	Advanced features in Perl.	Object oriented programming in Perl, Perl DBI, Advanced features in Perl, Advanced functions, operators files and directories System Interaction, Using Perl's command line tool, References and Structures, Perl CGI, BioPerl Modules	08
Total Number of Lectures			42

METHODOLOGY

The course will be covered through lectures and supported by practical.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
First Internal	60 minutes	20
Second Internal	45 minutes	15
Attendance		5
End Semester Exam	2 hours 30 minutes	60
Total		100

PRACTICALS IN PERL & BIOPERL (2 Hrs. Per Week) 50 MARKS**List of Practicals:**

1. Installation of Perl and BioPerl.
2. Scripting to understand the scalar data representation.
3. To write scripts using control structures.
4. Write scripts using arrays and lists with
5. Write scripts using hashes with biological example.
6. Write scripts for Basic I/O with biological
7. Writing regular expressions for motifs and
8. Write scripts using subroutines with biological example.
9. Scripting to create and delete directories and

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30
Total:	50

REFERENCES:

1. Bioinformatics – A Practical Guide to the Analysis of Genes and Proteins by Andreas Baxevanis, Francis Ouellette, Wiley-Interscience, 2005.
2. Introduction to Bioinformatics by T. K. Attawood & D.J. Parry-smith, 8th reprint, Pearson education, 2004
3. Bioinformatics: Sequence and genome analysis by D. W. Mount, 2nd edition, CBS Publication, 2005.
4. Fundamental Concepts of Bioinformatics by D. E. Krane and M. L. Raymer, Pearson Publication, 2006.
5. Bioinformatics: Tools & Applications by D. Edward, J. Stajich and D. Hansen, Springer, 2009.
6. Bioinformatics: Databases, Tools & Algorithms by O. Bosu and S. K. Thurkral, Oxford University Press, 2007.

7. Bioinformatics: Methods and Applications - Genomics, Proteomics and Drug Discovery by S.C. Rastogi, N. Mendiratta, P. Rastogi, PHI Learning Pvt. Ltd., 2015.

Matrix for Program Outcome and Program Specific Outcome

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 605.1	3	2	1	-	-	1	-	-	1	1	-	1	1	1	1
BT 605.2	3	3	2	-	-	1	-	-	1	1	-	1	2	2	1
BT 605.3	3	3	2	1	-	-	-	-	1	1	-	1	2	2	1
BT 605.4	3	3	2	2	-	1	-	-	3	2	-	2	1	1	1
BT 605.5	3	3	3	2	-	2	-	-	2	2	2	2	3	2	3
BT 605.6	3	3	3	3	3	2	1	2	3	2	2	1	2	2	2

Elective II

COURSE: STRUCTURAL BIOLOGY

COURSE CODE: BT606

MARKS: 150 (Theory 100+Practical 50)

L T P H C

3 0 2 5 4

OBJECTIVE

The objective of the course is to familiarize the student with Structural Biology.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT606.1	Outline the potential of bioinformatics in solving biological problems and discuss the hierarchy of secondary and tertiary structures of proteins with various structure prediction and validation techniques
BT606.2	Illustrate RNA secondary structure prediction and determination using various tools and methods
BT606.3	Discuss protein-RNA interactions and illustrate genome annotation and functional genomics
BT606.4	Demonstrate various differential gene expression tools for functional analysis
BT606.5	Explain protein dynamics using various computational methods and algorithms

BT606.6	Explore the secondary structural databases and tools for explaining the functionality of the molecules
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PREREQUISITES

Students should be familiar with school level mathematics and Biology to take up this course. In case they do not have mathematics at the twelfth level they should have cleared the core mathematics in the first semester.

COURSE DESCRIPTION

Unit	Topics	Detailed syllabus	No. of Lectures
1	Protein sequences, sequence alignment; Basic polypeptide stereochemistry	Overview and scope of Bioinformatics, Computers in biology, medicine & different problems in biology.	02
	Hierarchy in protein folds:.	Secondary structure, tertiary structure; Protein structure determination by X-ray crystallography	05
	Principles of protein purification, crystallization, structure determination; Structure validation and best practices on the use of protein structures from the protein data bank; Protein fold-function relationships; structure and annotation.	protein purification, crystallization, structure determination Methods, Structure function relationship.	03
2	Tools and methods for structure prediction	Homology Modeling, Fold (Threading) prediction, Ab-initio method of structure prediction, Deep learning methods.	02
3	Protein RNA interaction and functional Analysis	Understanding Protein-RNucleic Acid complexes; Specific and non-specific interaction DNA-Protein and DNA-drug interaction	04
4	Gene to structure functional analysis	Conformation of DNA and RNA	03
5	Protein Dynamics	Protein functional dynamics, Protein dynamics studies by MD simulations;	02
	Protein dynamics by NMR;	Basic NMR techniques	03
	Protein dynamics studies by other biophysical techniques.	Computational Methods and Algorithms	03

6	Introduction to structural Bioinformatics.	Structure database and tools	03
Total Number of Lectures			45

METHODOLOGY

The course will be covered through lectures and supported by practical.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
First Internal	60 minutes	20
Second Internal	45 minutes	15
Attendance		5
End Semester Exam	2 hours 30 minutes	60
Total		100

REFERENCE BOOKS

1. Biophysics – An Introduction by Cotterill, Wiley Student Edition.
2. Foundations of Biophysics by A.L. Stanford, Academic Press.
3. Principles of protein structure by G Schulz and R H Schrimmer, Springer Verlag.
4. Principles of nucleic acid structure by Sanger, Springer Verlag.
5. Introduction to Protein Science by Arthur M Lesk, Oxford University Press.
6. Biological Spectroscopy by J. D. Campbell and R. A.Dwek, Plenum Press.
7. A Textbook of Biochemistry and Biophysics by S.M Gopinath, Archers & Elevators International Publishing House, India. 1st Edition, 2014.

PRACTICAL IN STRUCTURAL BIOLOGY (2 Hrs. Per Week) MARKS: 50
List of Practicals:

1. Understanding Protein structures and Visualization
2. Drawing helical wheel for alpha helix
3. Using Rasmol and PyMOL for 3-D visualization
4. Analysis of protein-protein interaction and protein-DNA interaction
5. Advanced PyMOL usage
6. Use of PDBsum for structural analysis

7. Protein-Ligand interactions: LIGPLOT
8. Secondary structure prediction methods
9. PROSITE - Protein signature patterns
10. RNA secondary structure visualization

PRACTICAL EVALUATION SCHEME:

Examination	Marks
Internal (Continuous) assessment	20
End semester examination:	30
Total:	50

References:

- 1) Introduction to Protein Structure, Carl Branden and John Tooze, Garland Publishing Inc., New York 29.
- 2) Bioinformatics: sequence and Genome Analysis, DW Mount, Cold Spring Harbor Laboratory Press, 2003. Creighton T.E. ed.
- 3) Protein structure. A practical approach. (2004) Oxford University Press

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 606.1	2	2	2	1	2	-	-	-	1	2	-	1	2	2	1
BT 606.2	2	2	3	2	1	-	-	-	2	2	-	1	2	2	1
BT 606.3	3	2	3	2	2	2	1	1	2	1	2	1	2	2	2
BT 606.4	3	3	3	2	2	2	1	2	2	2	2	2	2	2	3
BT 606.5	2	3	3	3	3	1	1	1	2	2	1	2	2	2	2
BT 606.6	3	3	3	3	2	2	1	2	2	3	2	2	1	1	1

COURSE: INDIAN KNOWLEDGE SYSTEM: INDIAN CONSTITUTION AND LAW**COURSE CODE: BTIKS601****L T P H C****MARKS: 50 (Theory 50)****1 0 0 0 1****OBJECTIVE**

The objective of the course is to provide the students an introduction of Indian Constitution, its basic constituents and overview on the legal system in this country

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BTIKS601.1	Recognize the importance, sources, structure and principles of Constitution of India

BTIKS601.2	Comprehend the composition and powers of Parliament and State Legislatures
BTIKS601.3	Know the significance of local governance.
BTIKS601.4	Appreciate the structure and roles of judiciary in India

PREREQUISITES

Any student who has passed the Intermediate/ISC Class-XII/AISSE of CBSE or equivalent examinations in India or abroad.

COURSE DESCRIPTION

Unit	Topics	Detailed syllabus	No. of Lectures
1	Introduction to the Constitution of India	The Constitution of India and the Preamble. Sources and features of Indian Constitution. Citizenship, Fundamental Rights and Duties Directive Principles of State policy. Concept of Federalism, Federalism in India: Relationship between Central and State Governance. The three pillars of Indian Governance: Parliament, Executive and Judiciary. Roles of Election Commission in India.	3
2	Union Government and its administration	Legislature: Lok Sabha, Rajya Sabha, and their powers and roles. Executive: Appointments, powers and roles of President, Vice-President, Prime Minister and Council of Ministers. Introduction to civil services in India. Judiciary: Authorities and roles of the Supreme Court and the High Court.	3
3	State Government and its administration	Legislative Assembly, Legislative Council, their control and functions. Appointments, powers and roles of Governor, Chief Minister and Council of Ministers of the State.	3
4	Local Governance in India	Evolution of Local Governance in India. Composition of District Administration, their authorities and roles. Importance of Municipalities. Panchayati Raj: Composition and their functions, 73rd and 74th Amendments in the Constitution of India, importance of Zilla Parishad, Panchayat Samiti and Gram Panchayat.	3
5	Indian Legal System	Jurisprudence, its evolution and types (in brief). History and significance of legal systems in India. Basics of Indian laws and their types. Enactment of laws, Law commission in India Alternate Dispute Redressal. Personal and International laws in India.	3
Total Number of Lectures			15

METHODOLOGY

The course will involve the conduct of a series of lectures to understand the various aspects of Constitution of India and an overview on the laws of the land.

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal*	45 minutes	15
Attendance		5
End Semester Exam	1 hour 15 minutes	30
Total		50

*Average of Internal I (15 marks) and Internal II (15 marks)

REFERENCES:

- 1) Durga Das Basu, Introduction to the Constitution of India, Gurgaon; LexisNexis, 2022 (26th edn.).
- 2) M.V.Pylee, India's Constitution, New Delhi; S. Chand Pub., 2017 (16th edn.).
- 3) J.C Johari, Indian Government and Politics, Shaban Lal & Co., 2012.
- 4) R. Bhargava, (2009) 'Introduction: Outline of a Political Theory of the Indian Constitution', in R. Bhargava (ed.) Politics and Ethics of the Indian Constitution, New Delhi: Oxford University Press.
- 5) Bidyut Chakrabarty & Rajendra Kumar Pandey, Indian Government and Politics, SAGE, New Delhi, 2008.
- 6) G. Austin, The Indian Constitution (OIP): Cornerstone of a Nation, Oxford, Oxford University Press, 1999.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BTIKS601.1	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-
BTIKS601.2	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-
BTIKS601.3	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-
BTIKS601.4	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-

COURSE: FOREIGN LANGUAGE**COURSE CODE: BTSEC601****L T P H C****MARKS: 50 (Theory 50)****2 0 0 2 2****OBJECTIVE**

To develop students' proficiency in speaking, reading and writing in foreign language. Additionally to help promote communication across linguistic barriers, enhance cultural awareness and widen the horizon for future endeavors.

DESCRIPTION

The students are given an option to choose any one from the languages - German/ French/ Japanese/ Korean/ Spanish for the offline course. Two of the most favored languages among these are considered for the offline course, while the students are free to opt for any other language through the online MOOCs, provided it fits in the semester tenure.

At the end of the semester the students need to earn a certificate on the basis of which they will be given credits out of two.

COURSE: APTITUDE BUILDING-VI**COURSE CODE: BTAEC601****MARKS: 50 (Theory 50)****L T P H C****0 0 2 2 1****OBJECTIVE**

1. Help to trigger the students' logical thinking skills and apply it in the real-life scenarios
2. Learn to deploy the strategies of solving quantitative ability problems
3. To expand the verbal ability of the students
4. Assist to run the gamut of employability skills

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BTAEC601.1	Proficiency development in interacting and using decision making models effectively
BTAEC601.2	Comprehend the given concepts expressly to deliver an impactful presentation
BTAEC601.3	Acquire a knowledge of solving quantitative aptitude and verbal ability questions effortlessly
BTAEC601.4	Develop technical skills

PREREQUISITE:

Students should be familiar with basic scientific concepts to take up this course.

COURSE DESCRIPTION

Sr no.	Practical/Training/Tests/Interviews	Contact Hours
1	Logical Reasoning puzzles - Advanced	02
2	Logical connectives, Syllogism and Venn diagrams	02
3	Permutation, Combination and Probability - Advanced	04
4	Quantitative Aptitude	06
5	Image interpretation	02
6	Critical Reasoning - Advanced	02
7	Genome, transcriptome and proteome analysis	02
8	Market Survey/Market Intelligence	02
9	Bioindicators	02
10	Competitive Examination Preparation	02
11	Mock Interviews	02
12	Discussion session-Industry Experts/Academia Experts/Alumni	02
	TOTAL	30

METHODOLOGY

The course will be covered through Lectures/Assignments/Practical/Training/Tests/Interviews

EVALUATION SCHEME (THEORY)

Examination	Marks
Internal (Continuous) Assessment	20
Assignments/Practical/Training/Tests/Interviews	30
Total	50

REFERENCES:

1. R. S. Aggarwal, (2017). Quantitative Aptitude for Competitive Examinations, 3rd (Ed.). New Delhi: S. Chand Publishing
2. ETHNUS, (2016). Aptimithra, 1st (Ed.). Bangalore: McGraw-Hill Education Pvt. Ltd.
3. Arun Sharma, (2016). Quantitative Aptitude, 7th (Ed.). Noida: McGraw Hill Education Pvt. Ltd.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BTAEC601.1	-	2	2	1	2	-	-	-	-	1	1	2	2	-	-
BTAEC601.2	1	1	1	-	-	-	-	-	-	1	-	1	1	-	-
BTAEC601.3	1	1	1	-	2	-	-	-	-	2	-	1	1	-	-
BTAEC601.4	1	1	1	-	1	-	-	-	-	1	-	1	1	1	-

SEMESTER VII						
Course Code	Course Name	L	T	P	Hr	Cr
BI701	Molecular Modeling	2	0	4	6	4
BT701	Nanobiotechnology and Biosensors	2	0	2	4	3
HU701	Principles of Management & Entrepreneurial Development	2	0	0	2	2
HU702	Quality Control Management in Biotechnology	2	0	0	2	2
BT702	Seminars in Biotechnology	2	0	0	2	2
BT 703/BT704/ BT705	Elective-III BT703 Metabolic Engineering BT704 Agriculture Biotechnology BT705 Cancer Biology	3	0	2	5	4
BTAEC701	Aptitude Building-VII	0	0	2	2	1
Total		13	0	10	23	18

COURSE: MOLECULAR MODELING**COURSE CODE: BI701****MARKS: 150 (Theory 50+Practical 100)****L T P H C****2 0 4 6 4****OBJECTIVES:**

This course gives detailed information on the basics, recent advances, and various applications of molecular modeling and drug designing.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BI701.1	Explain molecular modelling and relate the concepts of mathematics such as matrices and coordinates in computational representation and calculation of molecular properties
BI701.2	Illustrate various molecular file formats
BI701.3	Acquire the concepts of molecular and quantum mechanics including dynamics, and discuss energy minimization algorithms
BI701.4	Design novel lead molecules and optimize existing drugs using structure and ligand based drug designing approaches

PREREQUISITES:

This is an introductory course for the students who want to understand the concepts in molecular modeling and drug designing and should make a compulsory subject.

COURSE DESCRIPTION

Unit	Topic	Detail Syllabus	No. of Lectures
1	Introduction to Molecular modeling and chemoinformatics	History, importance and application	01
	Molecular Graphics Representation	Representation of molecules using co-ordinates, Matrices and tables	06
	Building of molecules	Building of small molecules, Building of Biopolymers DNA & oligopeptides in different secondary structure	02
2	File Formats	SMILES, mol, mol2, sdf, pdb etc.	04
3	Energy Calculation (Molecular Mechanics and Quantum Mechanics)	Energy calculation using force fields and Schrodinger equations	04
	Geometry Optimization	Energy minimization by systematic search Method, Gradient based Energy minimization, Monte Carlo method, Genetic algorithm and simulated annealing. Molecular Dynamics	04
4	Ligand based drug design techniques	2D and 3D QSAR, Pharmacophore	06
	Structure based drug design techniques	Docking and Pharmacophore	03
Total Number of lectures			30

METHODOLOGY:

EVALUATION SCHEME (THEORY):

Examination	Duration	Marks
Internal*	45 minutes	15
Attendance		5
End Semester Exam	1 hour 15 minutes	30
Total		50

*Average of Internal I (15 marks) and Internal II (15 marks)

PRACTICAL IN MOLECULAR MODELING & DRUG DESIGNING (4 Hrs. Per Week)

Marks: 100

List of Practicals:

1. Generating Raster and Vector Graphics file and its importance
2. Extraction and Visualization of Macromolecules from database (Proteins & DNA) using Pymol
3. Extraction and Visualization of Macromolecules from database (Proteins & DNA) using Discovery Studio.
4. Extracting Small molecular structures from Databases by similarity Searching
5. Generating small Molecules using Fragment Library
6. Generating small molecules using drawing tools available in the software
7. Studying the protein databank file format
8. Preparation and study of different small molecular file formats
9. Studying the 2D and 3D file formats.
10. Calculation of total energy of the molecules
11. Generation of molecular conformations: Energy Minimization
12. Comparison of energies of a molecule obtained from various sources.
13. Calculation of Molecular Properties.
14. Protein and Ligand Preparation for Docking
15. Studying Protein-ligand interaction through Docking

PRACTICAL EVALUATION SCHEME:

Examination	Marks
Continuous assessment	40
End semester examination	60
Total:	100

REFERENCES:

1. Engel, T. & Gasteiger, J. (2018). Applied Chemoinformatics: Achievements and Future Opportunities. Wiley,.
2. Engel, T. & Gasteiger, J. (2018). Chemoinformatics: Basic Concepts and Methods. Wiley .
3. Brown, N. (2016). In Silico Medicinal Chemistry, . RSC Publishing.
4. Wild, D. (2013), Introducing Cheminformatics. LuLu.
5. Faulon, J. L. & Bender, A. (2010). Handbook of Cheminformatics Algorithms. CRC.
6. Leach, A.R. & Gillet, V. J. (2003), An Introduction to Cheminformatics. Springer.
7. Engel, T. & Gasteiger, J. (2003). Cheminformatics: A Textbook. Wiley.
8. <https://www.youtube.com/watch?v=tFHBQJFic9Q>
9. http://www.mrc-lmb.cam.ac.uk/rlw/text/MacPyMOL_tutorial.html
10. Chemoffice Tutorial 2004
11. https://sites.ualberta.ca/~pwinter/Molecular_Docking_Tutorial.pdf
12. Practical Cheminformatics, Karthikeyan Muthukumarasamy, Vyas Renu, Springer 2014

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BI 701.1	3	3	1	-	1	-	-	-	2	2	-	2	3	1	1
BI 701.2	1	2	-	-	2	1	-	-	1	1	-	2	1	1	1

SYLLABUS FOR B. TECH. BIOTECHNOLOGY

BI 701.3	3	1	3	2	3	1	3	2	1	3	1	3	2	2	2
BI 701.4	2	2	2	2	2	2	1	1	1	2	2	3	1	1	1

COURSE CODE: BT701**MARKS: 100 (Theory 50+Practical 50)****L T P H C****2 0 2 4 3****OBJECTIVES:**

The objective of the course is to familiarize the students with advanced research area and basic concept in Nanobiotechnology and Biosensors

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT701.1	Comprehend the basics of nanobiotechnology, nanomaterials and nanoparticles
BT701.2	Demonstrate the knowledge of nanobiotechnology in various fields such as medicine, drug encapsulation, drug delivery and other applications
BT701.3	Explain the construction and designing of various types of biosensors
BT701.4	Describe the different applications of biosensors in various fields such as health care, agriculture and environment

PREREQUISITES:

Since it is advance course, student should be familiar with basic knowledge of physics, chemistry, and biology.

COURSE DESCRIPTION:

Unit	Topic	Detail Syllabus	No. of Lectures
1	Introduction to Nanobiotechnology	-Nanotechnology and nanobiotechnology, History, -Broad perspective, and Today's World, -Significance of Nanoscale materials.	03
	Nanomaterials and nanoparticles	-Different classes of nanomaterials - Synthesis and characterization of nanomaterials - One, two, and three dimensional structure of nanomaterials - Bio-mimetics	06
2	Application of Nanomaterials in medicine	-Drug delivery -Drug encapsulation -Tissue repair and implantation -Nanocoatings - Miniaturized devices/ Lab on a chip Toxic effects of nanomaterials	05
3	Biosensors: General Concepts	-Introduction to biosensors -History of biosensors discovery	02
	Construction and designing of biosensors	- Components of a typical biosensor - Types of biosensors (Calorimetric, Potentiometric, amperometric, optical, Piezo-electric, Immuno based sensors)	05
4	Applications of biosensors	-Associated electronics with each category of biosensor - Applications related to healthcare, bio-defense, food and water safety, agriculture and environment	06

4	Case studies	-Success and failure of Nanodevices and biosensors with suitable examples -Multidisciplinary interactions for biosensor development	03
Total Number of Lectures			30

METHODOLOGY:

The course would be taught through lectures and practical.

EVALUATION SCHEME (THEORY):

Examination	Duration	Marks
Internal*	45 minutes	15
Attendance		5
End Semester Exam	1 hour 15 minutes	30
Total		50

*Average of Internal I (15 marks) and Internal II (15 marks)

PRACTICAL IN NANOBIO TECHNOLOGY AND BIOSENSORS: 2 hours per week Marks: 50**List of Practicals:**

1. Preparation of silver nanoparticles using sodium borohydride
2. Green synthesis of silver nanoparticles using bacteria/plant/fungi
3. Characterization of nanomaterials using Scanning Electron Microscopy.
4. Evaluation of antimicrobial activity of silver nanoparticles against Gram Positive and Gram negative microorganisms
5. Increasing bioavailability of drugs using nanostructured Beta-cyclodextrin
6. Entrapment of silver nanoparticles in alginate beads for remediation of water.
7. Study of principle and working of glucose biosensor
8. Study of conductivity of DNA for use in biosensor
9. Internalization of drug conjugated nanoparticles in mammalian cells
10. Study of nano-structured materials used for tissue engineering

PRACTICAL EVALUATION SCHEME

Examination	Marks
Internal (Continuous) assessment:	20
End semester examination:	30

Total:**50****REFERENCES:**

1. Biosensors and Nanotechnology, (Editors; Zeynep Altintas) John Wiley & Sons Inc, 2017, ISBN: 9781119065159, 9781119065159
2. Biosensors and Bioelectronics: D. Dharaneeshwara Reddy, O.M Hussain, DVR. Sai Gopal, Muralidhara Rao, and K.S Sastry. I. K International Publishing House Pvt. Ltd, New Delhi. ISBN 978-93-82332-19-0, Year?
3. C. M. Niemeyer, “Nanobiotechnology: Concepts, Applications and Perspectives”, Wiley – VCH, 2006
4. David S Goodsell, “Bionanotechnology”, John Wiley & Sons, 2004
5. Understanding Nanomedicine: An Introductory Textbook, Rob Burgess, Publisher: Pan Stanford Publishing; ISBN-13: 978-9814316385, year?
6. Introduction to Nanoscience, S.M. Lindsay, Oxford universal Press, First Edition, 2010
Nanotechnology: Understanding small system, Ben Rogers, SumitaPennathur and Jesse Adams, CRC Press, Second edition, 2011
7. Nanobiotechnology: Bioinspired Devices and Material of Future by Oded Shoseyov and Ilan levy, Human Press, First edition, 2007. The Nanobiotechnology Handbook (Editor; Yubing Xie) CRC press.
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- 8. *Journal of Radiation Research and Applied Sciences*. 2016 9 (1):1-7
9. *Journal of Radiation Research and Applied Sciences*. 2016, 9(3):217-227
10. Bridging the Gap. *Current Drug Discovery Technologies*, 2014, 11, 197-213

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 701.1	2	1	-	-	-	-	1	3	2	1	-	3	2	-	-
BT 701.2	3	3	3	3	-	3	2	3	2	-	3	3	2	2	-
BT 701.3	3	3	3	2	3	2	3	3	3	1	2	3	2	2	2
BT 701.4	3	3	2	3	3	3	3	2	2	1	2	3	2	2	3

COURSE: PRINCIPLES OF MANAGEMENT AND ENTREPRENEURIAL DEVELOPMENT**COURSE CODE: HU701****L T P H C****MARKS:50 (Theory 50)****2 0 0 2 2****OBJECTIVES:**

- Make students understand the work culture in an organization
- Preparing them to be competent in the corporate world
- Motivate students to critically analyse the problem and solve it
- Apply the knowledge of management in their future endeavour

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
HU701.1	Comprehend basic principles of management, including planning, organizing, leading, and controlling
HU701.2	Develop leadership, problem-solving, and decision-making skills that are valuable in various aspects of business
HU701.3	Develop an entrepreneurial mindset, innovation, and a willingness to take calculated risks, which are crucial for aspiring entrepreneurs
HU701.4	Demonstrate versatile abilities such as understanding financial concepts, business ethics, and social responsibility

PREREQUISITE:

This is an application based and management learning course, so students must have an understanding of the application oriented subject such as Food Biotechnology, rDNA Technology, Plant Biotechnology, Cancer Biology, Pharmaceuticals and Drugs research.

COURSE DESCRIPTION:

Unit	Topic	Detail Syllabus	No. of Lectures
1.	Principles of Management	Introduction to Management- Management and Manager Definition, Purpose of Management, Management function, Manager Role in Management, Levels of Management	4
		Planning - Nature of planning, Importance of Planning Planning Process, Barriers to effective planning	5

		Forecasting - Importance of Forecasting, Limitations of forecasting, Techniques of Forecasting	
		Organising - Concept of Organising, Advantages of Organising, Need for organising structure Directing - Concept of Directing, Principles of Directing Leadership - Importance of Leaders, Leadership theories (Trait, Behavioural, Situational) Controlling - Importance of controlling, Controlling Process.	6
2.	Entrepreneurial Development	Preparation of Business plan for Biotech Start-up Importance of Licensing Technology/Research Raising money from Venture Capitalists Government Grants	4
		Human Resources management - Definition, Functions and Objectives, Image and qualities of HR Manager Customers and Competitors Marketing - Introduction to Marketing Management, Role and Function of Marketing Manager.	6
		Current challenges in an Organization Diverse and Global work force Partnerships and Strategic Alliances	5
Total Number of Lectures			30

METHODOLOGY:

The course would be covered through lectures, supported by quizzes and case history discussion.

EVALUATION SCHEME (THEORY):

Examination	Duration	Marks
I Internal	45mins	15
Teachers assessment		05
End Semester Exam	1hr 15mins	30
Total		50

REFERENCES:

- 1) Principles and Practice of Management - by L M Prasad, 9th Edition, 2016
- 2) Principles of Management - by P C Tripathi and P N Reddy, 6th Edition, 2017.
- 3) A Handbook on Marketing Management - by Dr V O Varkey, 4th Edition, 2000.
- 4) Human Resource and Personnel Management- by K Aswathappa, 4th Edition, 2007

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
HU 701.1	-	-	-	-	-	2	-	-	2	1	2	2	2	1	-
HU 701.2	-	-	-	-	-	2	-	-	3	1	1	1	1	2	-
HU 701.3	-	2	2	2	1	2	-	2	2	1	2	2	2	1	-

HU 701.4	-	-	-	-	-	2	2	3	1	1	2	2	2	2	2
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COURSE: QUALITY CONTROL MANAGEMENT IN BIOTECHNOLOGY**COURSE CODE: HU702****MARKS: 50 (Theory 50)****L T P H C****2 0 0 2 2****OBJECTIVES:**

- Make students realise the importance of Quality control in Pharma and biotech industry
- Prepare students competent in the field of quality control management of drugs and biopharmaceutical
- Create a general motivation amongst students to critically analyse the problem and to apply the knowledge of quality management in their future endeavour.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
HU702.1	Comprehend and apply various quality management systems of national and international importance.
HU702.2	Manage comprehensive records and documentation to track and verify the quality of products as per the principles of various Quality Management systems including GMP, GLP and NABL
HU702.3	Develop awareness of ethical considerations as defined by various national and international bodies to be able to comply and ensure the safety & efficacy of biotechnological products in research and industry
HU702.4	Acquire capability to formulate and implement quality assurance systems and processes, ensuring that products meet regulatory and industry standards as per the governing body of biotechnology industry

PREREQUISITE:

This is a unique course comprising the combination of research, industry and management, so students should have understanding of all the basic concepts in biotechnology and should be well aware with the working and functioning of the biotech and pharma based industries.

COURSE DESCRIPTION:

Unit	Topic	Detail Syllabus	No. of Lectures

1	Quality Management	Introduction, Definition of Quality, Evolution of Quality, Dimension of Quality, Factors affecting Quality, Definition of QA/QC.	2
	TQM	Definition of TQM, History of TQM, Concept, Principles of TQM, TQM Framework, Barriers in TQM implementation, Benefits of TQM, Statistical tools to measure quality, Demings Cycle/PDCA cycle, Quality Movement in India.	4
2	Pharmacopoeias	Overview of the latest Indian Pharmacopoeias.	1
	Standards Institutions	ISO 9000 Series, ISO 14000 Series, ISO 22000 Series, ISO 13485 Series, Bureau of Indian Standards (BIS).	6
	Good Manufacturing Practice (GMP) for pharmaceutical Products (API)	Pharmaceutical Manufacturing Flow Chart study, GMP Implementation at - Personnel, Building and Facility, Process Equipment, Material management, Production and in-process control, Packaging and labelling, Storage and Distribution, Laboratory control, Validation of analytical procedure, Rejection and Reuse of material, Complaints and recalls, Agents, Brokers, Distributors and Re-labellers, Documentation and Records.	8
	Good Laboratory Practices (GLP) and SOP	GLP - History, GLP implementation and organization, GLP status in India. Standard Operating Procedure - Introduction, Need and Implementation.	3
3	ICH	Introduction and ICH Process for Harmonization.	3
4	Indian Regulatory Agencies and Accreditation	Central Drug Standard Control Organization (CDSCO) for Drugs. Food Safety and Standards Authority of India (FSSAI) for Food. National Accreditation Board for Testing and Calibration Laboratories (NABL).	3
Total Number of Lectures			30

METHODOLOGY:

The course would be covered through lectures, supported by quizzes and case history discussion.

EVALUATION SCHEME (THEORY):**Examination****Duration****Marks**

SYLLABUS FOR B. TECH. BIOTECHNOLOGY

I Internal	45mins	15
Teachers assessment		05
End Semester Exam	1hr 15mins	30
Total		50

BOOKS RECOMMENDED

1. Quality control assurance by T. Anjaneyulu, First Edition(Fifth Reprint) - 2017
2. Pharmaceutical management by Sachin Itkar, Second Edition - 2007
3. Pharmaceutical Master Validation Plan by Syed Imtiaz Haider, First Indian Edition - 2001
4. Biopharmaceuticals Second Edition by Gary Walsh, Second Edition -2011

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
HU 702.1	1	1	-	-	1	-	1	2	2	1	1	1	2	1	-
HU 702.2	2	2	-	-	1	-	2	3	2	1	2	2	2	2	-
HU 702.3	1	1	-	-	-	2	1	3	1	1	1	2	2	2	-
HU 702.4	2	2	2	2	2	3	2	2	1	2	2	2	2	2	1

COURSE: SEMINARS IN BIOTECHNOLOGY**COURSE CODE: BT702****MARKS: 50**
L T P H C
2 0 0 2 2
OBJECTIVES OF THE COURSE:

- To train the students for literature survey
- To understand and present a particular topic, published research work in front of an audience
- To develop capability and potential to discuss, delineate a topic precisely, professionally in an interactive manner

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT702.1	Examine specific topics that can provide insights into the most recent developments in medicine, food, agriculture and different areas of biotechnology
BT702.2	Evaluate research information and appreciate how strategies are developed to address specific scientific questions
BT702.3	Develop critical thinking and scientific temper
BT702.4	Demonstrate presentation skills, communication abilities, and confidence in sharing their work with a broader audience
BT702.5	Examine different viewpoints and approaches in biotechnology to broaden knowledge horizons
BT702.6	Acquire knowledge in developing ideas, projects and their own research questions

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT 702.1	2	1	-	-	-	-	-	2	2	1	-	2	2	1	-
BT 702.2	2	1	-	-	-	-	-	2	2	2	-	2	2	2	-
BT 702.3	2	2	1	-	-	-	-	2	2	2	-	3	2	2	-
BT 702.4	2	2	-	-	-	1	-	2	2	3	2	3	2	2	-
BT 702.5	2	2	-	-	-	-	-	-	2	1	-	2	2	2	2
BT 702.6	2	2	2	2	3	2	2	1	2	2	2	3	3	3	2

Elective III**COURSE: METABOLIC ENGINEERING****COURSE CODE: BT703****MARKS: 150 (Theory 100+Practical 50)****L T P H C****3 0 2 5 4****OBJECTIVES:**

- The course will provide an overview of the basic concepts and experimental techniques used in metabolic engineering and its applications in production of useful compounds of industrial importance.
- The students will also learn that how complex regulatory mechanisms at multiple levels control the dynamics of the cellular metabolism.
- The course will also cover examples of successful engineering strategies used for the production of commercially important primary and secondary metabolites or recombinant proteins.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT703.1	Explain the basic concepts of metabolic engineering, cellular reactions, enzyme kinetics and their regulation
BT703.2	Discuss strain-engineering strategies to alter cellular behaviour, metabolic flux and product formation
BT703.3	Analyse the methods for metabolic flux determination
BT703.4	Illustrate different pathways for the production and regulation of metabolites, and techniques for strain improvement
BT703.5	Plan the application of pathway databases in metabolic engineering
BT703.6	Comprehend various industrial applications of metabolic engineering in the fields of medicine, energy, and environment

PREREQUISITES:

Students should be familiar with basic concepts of biochemistry, metabolism and bioinformatics.

COURSE DESCRIPTION:

Unit	Topics	Detailed syllabus	No. of Lectures
1	Introduction to metabolic engineering and its importance	Introduction to metabolism, catabolism, anabolism. Basic concepts of metabolic engineering. Key differences between metabolic controls of prokaryotes and eukaryotes. Stoichiometry of cellular reactions, enzyme kinetics, reaction rates, dynamic mass balance, yield coefficients and linear rate equations, different models for cellular Reactions, Induction, Jacob Monod Model and its regulation, differential regulation by isoenzymes, concerted or cumulative	12

		feedback regulation. Regulation in branched pathways, permeability and transport of metabolites.	
2	Metabolic flux analysis.	Building stoichiometric matrix; Steady state and pseudo steady state assumptions; Using different optimizing functions to solve linear programming problem; understanding flux cone and constraints; Introducing additional constraints from thermodynamics.	08
3	Experimental determination of metabolic fluxes.	C13 labeling, NMR and GC-MS based methods for flux determination.	04
4	Computational study of metabolic engineering.	Understanding and exploring various metabolic pathways such as KEGG, BRENDA, Reactome, DAVID, STRING.	05
5	Metabolic pathway models	Network pharmacology and its application in finding important targets in a pathway.	05
6	Industrial applications of metabolic engineering.	Pathway engineering strategies for overproduction of some commercially important primary and secondary metabolites (e.g. amino acids, organic acids, alcohols and therapeutic compounds) or industrially relevant enzymes and recombinant proteins, bioconversion-applications and factors affecting bioconversion, mixed or sequential bioconversions, regulation of enzyme production, strain selection and improvement, the modification of existing or the introduction of entirely new metabolic pathways.	08
Total Number of Lectures			42

METHODOLOGY:

The course will be covered through lectures and supported by practical.

EVALUATION SCHEME (THEORY):

Examination	Duration	Marks
I Internal	1 hour	20
II Internal	45 minutes	15
Attendance		05
End Semester Exam	02 hours 30 minutes	60
Total		100

PRACTICAL IN METABOLIC ENGINEERING: 2 Hrs. Per Week MARKS: 50

List of Practicals:

1. Expression of metabolic enzymes in bacterial systems for metabolite engineering.
2. Effect of different parameters such as substrate concentration on metabolite expression.
3. Isolation and purification of industrially relevant metabolic enzymes.
4. Validation of enzyme expression and its effect on metabolic changes.

5. Extraction of Genes from KEGG
6. Screening of pathways getting affected by administration of drugs
7. Generate interaction map using list of genes
8. Exploring Cytoscape for representing a network.
9. Finding Hub Genes

PRACTICAL EVALUATION SCHEME

Examination	Marks
Continuous assessment:	20
End semester examination:	30
Total:	50

REFERENCES:

1. Metabolic Engineering: Principles and Methodologies by Gregory N. Stephanopoulos, Aristos A. Aristidou, and Jens Nielsen, Academic Press, 1998.
2. Pathway Analysis and Optimization in Metabolic Engineering by Néstor V. Torres and Eberhard O. Voit, Cambridge University Press, 2002.
3. The Metabolic Pathway Engineering Handbook: Fundamentals by Christina D. Smolke, CRC Press, 2009.
4. The Metabolic Pathway Engineering Handbook: Tools and Applications by Christina D. Smolke, CRC Press, 2009.
5. Biochemical Engineering by Harvey W. Blanch and Douglas S. Clark, Marcel Dekker, 1995.
6. Synthetic Biology – Metabolic Engineering by Huimin Zhao, An-Ping Zeng, Springer 2018.
7. Metabolic Engineering for Bioactive Compounds: Strategies and Processes by Vipin Chandra Kalia, Adesh Kumar Saini, Springer 2017.
8. Metabolic Engineering by Sang Yup Lee and Eleftherios T. Papoutsakis, Marcel Decker 1999.
9. The Metabolic Pathway Engineering Handbook: Tools and Applications by Christina D. Smolke, CRC Press, 2009.
10. <https://www.kegg.jp/>
11. <http://mousecyc.jax.org/>
12. <https://reactome.org/>

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT703.1	3	2	3	-	-	-	-	-	2	3	-	2	1	1	1
BT703.2	1	2	3	3	3	2	2	2	2	1	-	3	1	1	1
BT703.3	2	2	3	3	3	2	2	2	2	2	-	3	1	1	1

BT703.4	1	2	3	3	3	2	2	3	3	2	2	3	1	3	2
BT703.5	3	3	3	3	3	2	1	1	2	2	1	2	3	3	3
BT703.6	2	2	2	2	2	1	2	2	2	2	1	2	3	3	3

Elective III**COURSE: AGRICULTURE BIOTECHNOLOGY****COURSE CODE: BT704****MARKS: 150 (Theory 100+Practical 50)****L T P H C****3 0 2 5 4****OBJECTIVES:**

- To familiarize the students with basic concepts of Agriculture Biotechnology
- To clarify major scientific, ecological and sociological aspects of biotechnology in agriculture and food production.
- To familiarize advanced molecular biology applications in Agriculture Biotechnology

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT704.1	Comprehend aspects of biotechnology in agriculture and its application in <i>in vitro</i> plant production
BT704.2	Apply different techniques for crop improvement using genetic engineering
BT704.3	Apply recent techniques for plant genotyping
BT704.4	Discuss various methods for production of secondary metabolites, pharmaceutically and commercially important proteins, edible vaccines and therapeutics
BT704.5	Devise strategies for manufacturing of biofertilizers, biopesticides and other plant products
BT704.6	Explain the significance of biotechnology in hydroponics and animal farming; ethical considerations in the development of genetically and its application to develop genetically modified products

PREREQUISITES:

The course is an application science, hence the student must have a background with knowledge in the basics of Plant Physiology, Plant Tissue culture and Molecular Biology.

COURSE DESCRIPTION:

Unit	Topics	Particulars	No. of Lectures
1	Introduction	Introduction: Agriculture and Agricultural Biotechnology	2
	Aspects of Plant production	<i>In vitro</i> Germplasm Conservation	2
		Micro propagation	2
		<i>In vitro</i> production of pathogen and/or disease-free plants	2

2	Techniques for Crop Improvement	Biotechnology- Methods of Crop Improvement Genetic Engineering for Crop Plants Improvement. Methods of gene transfer in plants, Transgenic Plants for biotic and abiotic stress resistance, <i>In vitro</i> induced mutagenesis Role of antisense and RNAi in crop improvement, Regulated and tissue specific expression of transgenes for crop improvement, Terminator gene technology	3 3 5
3	Techniques for Plant Genotyping	Recent advances – Non gel based techniques for plant genotyping – Homogenous assays – Qualitative/Real Time assays; DNA Chip and its technology. Molecular breeding (MAS) Transgenic Plants, Molecular Markers, QTL Mapping	3 3 3
4	Methods for production of plant metabolites	<i>In vitro</i> Production of Secondary Metabolites Production of foreign compounds in transgenic plants Molecular Pharming, Production of Edible vaccines and other therapeutics, Biotransformation	5
5	Strategies for manufacturing plant products	Biofertilizers and Phyto-remediation Biopesticides, Agricultural antibiotics	5
6	Modern techniques and it ethical aspects	Biotechnology in Agriculture, Hydroponics, Biosafety regulations, Ethical Aspects and Public Acceptance (Case studies)	3
		Animal farming, Animal farming with organic concept, Animal Breeding & Genetically modified animal products.	5
Total Number of Lectures			45

METHODOLOGY:

The entire course is covered through lectures, group discussions and with the help of ICT enabled teaching aids including PPTs, visits, E-learning resources etc.

EVALUATION SCHEME (THEORY):

Examination	Duration	Marks
I Internal	1 hour	20
II Internal	45 minutes	15
Attendance	---	5
End Semester Exam	2 hours 30 mins	60
Total		100

PRACTICAL IN AGRICULTURE BIOTECHNOLOGY: 2 hrs. per week Marks:50**List of Practicals:**

1. Use of bioreactors in plant secondary metabolite production
2. Application of Polymerase Chain reaction – Marker based selection by using PCR
3. Agro-bacterium-mediated transformation protocol and selection of transformed regenerated plants (Laboratory visit)

4. DNA finger printing methods, RAPD, SSR.
5. Micropropagation, Visit to micro-propagation and Molecular Biology laboratory - a laboratory with automated Genotyping/sequencing facility.
6. Green house technology: Visit to functional green house. Climate: Measurement of temperature, humidity, air velocity, CO₂, inside the green house. Calculation of environment indices inside green house. Fertigation, Post-harvest

PRACTICAL EVALUATION SCHEME:

Examination	Marks
Internal (Continuous) Assessment:	20
End semester Examination:	30
Total:	50

BOOKS RECOMENDED:

1. Singh, B.D. and Shekhawat N.S. (2017). Molecular Plant Breeding. "Scientific Publishers."
2. Kumar, H. D. (2005). Agricultural Biotechnology "Daya Publishing House."
3. Wang, K. (2010). Agrobacterium Protocols, Volume 1. "Humana Press."
4. Gelvin, S. B. (2018). Agrobacterium Biology- From Basic Science to Biotechnology. "Springer International Publishing."
5. Altman, A. and Hasegawa, P. M. (2012). Plant Biotechnology and Agriculture-Prospects for the 21st Century. "Elsevier Science"
6. Singh, B. D. (2010). Biotechnology. "Kalyani Publishers."
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13. DNA finger printing in plants www.nbpgr.ernet.in/Divisions_and_Unit/Downloadfile.aspx?EntryId=7432
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Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT704.1	3	2	3	3	-	-	3	3	3	2	-	3	1	1	1

BT704.2	3	3	3	3	3	3	3	3	3	2	3	3	1	1	1
BT704.3	2	2	3	2	3	2	3	3	3	2	2	3	1	1	1
BT704.4	3	2	3	-	-	-	3	3	3	2	-	3	1	3	2
BT704.5	2	3	3	3	3	3	3	3	3	2	3	3	3	3	3
BT704.6	3	3	3	3	3	3	3	3	3	2	3	2	3	3	3

Elective III**COURSE: CANCER BIOLOGY****COURSE CODE: BT705****MARKS: 150 (Theory 100+Practical 50)****L T P H C****3 0 2 5 4****OBJECTIVES:**

- The objective of the course is to develop understanding of the biology of cancer
- The course will elaborate understanding of tumor hallmarks, carcinogens, diagnostic and therapeutic options to cancer patients

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BT705.1	Outline the basic principles of cancer biology, origin and development of cancer
BT705.2	Explain the causes of cancer and its classification based on stages and grades
BT705.3	Analyse molecular drivers like proto-oncogenes, oncogenes and tumor suppressor genes for their roles in cancer development
BT705.4	Evaluate the molecular and cellular mechanisms underlying cancer progression and metastasis
BT705.5	Examine different cancer biomarkers and their diagnostic roles
BT705.6	Discuss different treatment modalities including chemotherapy, immunotherapy and targeted therapies

PREREQUISITES:

Since the course is advance in nature, basic knowledge in biochemistry, cell biology, genetics, and molecular biology is essential.

COURSE DESCRIPTION:

Unit	Topic	Detail Syllabus	No. of Lectures
1.	Introduction to	Cancer statistics and problems at National and International	5

	cancer	perspectives. Origin of cancer cell, Genetic, molecular and epigenetic changes in cancer cells, Tumor hallmarks, Tumor microenvironment.	
2	Cancer progression	Basis of tumour progression, Steps in tumor progression, Cancer stem cell theory for origin of cancer, Classifications, stages and grades of tumors.	6
	Causes of cancer	Chemical carcinogenesis Endogenous & exogenous mutagens, Identification of carcinogens, Tumour initiators & tumour promoters	6
3	Molecular basis of cancer	Aberrant signaling in cancer, Cellular and viral oncogenes (Gain of Function), Deregulated apoptotic genes (Loss of functions), Genomic landscape of cancers, DNA repair response in cancer, Dysregulation of cell cycle and cell growth, mutation in apoptosis genes, The role of viral genes in cancer progression (DNA tumour virus (SV 40) and human papilloma virus (E6 and E7)).	5
3	Proto-Oncogenes and Oncogenes	Introduction to Oncogenes families Cell transforming ability of oncogene Retrovirus as a source of cancer Oncogenes: Ras, Myc, Src, Jun and Fos, Controlling factors of oncogene expressions	5
	Tumour suppressor genes	Molecular basis of tumor suppressor genes including Retinoblastoma (Rb), p53, Adenomatous polyposis coli (APC) in the development and progression of tumor.	4
4.	Metastasis	Molecular basis of metastasis, steps in cell invasion, intravasation, transport, colonization, angiogenesis.	4
5.	Cancer biomarkers and diagnostic options	Expanded diagnostic technique, Tumour markers, Nucleic acid based markers and mitochondrial DNA mutation markers, Epigenetic markers including DNA methylation pattern and chromatin remodeling, mitochondrial DNA	4
6.	Cancer therapy	Contemporary chemotherapy, radiotherapy Emerging therapies (Targeted delivery & Synthetic lethal approaches) Inhibitors of oncogenic protein, tumour blood vessels as target for cancer therapy Tumor immunology and cancer immunotherapies	6
Total Number of Lectures			45

METHODOLOGY

The entire course is covered through lectures, group discussions and with the help of ICT enabled teaching aids including PPTs, Image, Videos, E-learning resources etc.

EXAMINATION SCHEME (THEORY)

Examination	Duration	Marks
I Internal	45 minutes	15
II Internal	45 minutes	15
Teachers assessment		10
End Semester Exam	2 hours 30 minutes	60
Total		100

PRACTICAL IN CANCER BIOLOGY: 2 hrs. per week Marks:50

List of Practicals:

1. To perform MTT assay for the assessment and understanding of anti-proliferative and cytotoxicity effects using suitable drugs.
2. To study the effects serum starvation in cancer growth and its secreted microenvironment.
3. To observe migration and invasion metastasis and angiogenesis (One of hallmarks of cancer) using Boyden chamber assay.
4. To perform clonogenic assay to understand clonal concept and growth characteristics of cancer cells.
5. To study angiogenesis using chick embryo model.
6. To perform wound healing assay.
7. To study spheroid culture as a preferred model for cancer stem cell angiogenesis study

PRACTICAL EVALUATION SCHEME:

Examination	Marks
Internal (Continuous) Assessment:	20
End semester Examination:	30
Total:	50

REFERENCES:

1. The Biology of Cancer, 2nd Edition; Author(s): Robert A. Weinberg; Garland Science; 2nd edition (14 May 2013). ISBN: 9780815342205.
2. Molecular biology of the cell, Garland Science; 5th edition (November 16, 2007), By Bruce Alberts (Author), Alexander Johnson (Author), Julian Lewis (Author), Martin Raff (Author), Keith Roberts. ISBN-10: 0815341059, ISBN-13: 978-0815341055.
3. Cancer Biology, 4 edition (10 May 2007) By Raymond W. Ruddon, Oxford University press,

ISBN-10: 0195096908

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8. Pecorino L. *Molecular Biology of Cancer: Mechanisms, Targets, and Therapeutics.* Third Edition. 2012. Oxford University Press.
9. Dai Y, Grant S. 2011. Methods to study cancer therapeutic drugs that target cell cycle checkpoints. *Methods Mol Biol.* 2011;782:257-304. doi: 10.1007/978-1-61779-273-1_19.
10. Pecorino L. *Molecular Biology of Cancer: Mechanisms, Targets, and Therapeutics.* Third Edition. 2012. Oxford University Press.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BT705.1	1	3	2	-	-	-	-	-	1	1	-	3	1	1	1
BT705.2	1	3	2	2	-	1	-	-	1	2	1	2	1	1	1
BT705.3	1	2	2	3	2	1	2	1	1	1	2	2	1	1	1
BT705.4	1	2	2	2	3	1	1	1	1	1	2	3	1	3	2
BT705.5	1	3	3	3	3	1	1	1	1	2	2	3	3	3	3
BT705.6	1	2	3	3	3	3	1	2	1	1	2	3	3	3	3

COURSE: APTITUDE BUILDING-VII**COURSE CODE: BTAEC701****L T P H C****MARKS: 50 (Theory 50)****0 0 2 2 1****OBJECTIVE**

- Brush up of all the concepts of Aptitude & Life Skills
- Give students the confidence for their placements & future career opportunities

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BTAEC701.1	Acquire a knowledge of solving quantitative aptitude, reasoning and verbal ability questions effortlessly.
BTAEC701.2	Develop demonstrable hard skills
BTAEC701.3	Perceive noticeable soft skills
BTAEC701.4	Develop technical skills

PREREQUISITE:

Students should be familiar with basic scientific concepts to take up this course.

COURSE DESCRIPTION

Sr no.	Practical/Training/Tests/Interviews	Contact Hours
1	Industry specific-Aptitude and Life Skills	18
2	Biosensors	02

3	Practice Tests	04
4	Competitive Examination Preparation	02
5	Mock Interviews	02
6	Discussion session-Industry Experts/Academia Experts/Alumni	02
Total Number of Lectures		30

METHODOLOGY

The course will be covered through Lectures/Assignments/Practical/Training/Tests/Interviews

EVALUATION SCHEME (THEORY)

Examination	Duration	Marks
Continuous Internal Assessment		20
Attendance		
Assignments/Practical/Training/Tests/Interviews		30
Total		50

BOOKS RECOMMENDED:

1. R. S. Aggarwal, (2017). Quantitative Aptitude for Competitive Examinations, 3rd (Ed.). New Delhi: S. Chand Publishing
2. ETHNUS, (2016). Aptimithra, 1st (Ed.). Bangalore: McGraw-Hill Education Pvt. Ltd.
3. Arun Sharma, (2016). Quantitative Aptitude, 7th (Ed.). Noida: McGraw Hill Education Pvt. Ltd.

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BTAEC701.1	-	3	3	2	3	1	-	1	-	2	2	3	3	-	-
BTAEC701.2	2	2	2	-	-	1	-	1	-	2	-	2	2	-	1
BTAEC701.3	2	2	2	-	3	1	-	1	-	3	-	2	2	-	-
BTAEC701.4	2	2	2	-	2	1	-	1	-	2	-	2	2	2	-

Semester VIII		
BTMP801	Research Project/Industrial Training/ Review writing/Entrepreneurship Start-up (5 months)	22 Credits

OBJECTIVES:

The objectives of this course are to:

- Train the students to understand the research environment in a laboratory/ Industrial training and culture
- Enable students to learn practical aspects of research
- Impart training to the students for Literature review, Review writing, data analysis and thesis writing.

COURSE OUTCOME:

CO No.	At the end of the course, the learner should be able to:
BTMP801.1	Acquire in-depth knowledge of the chosen area of research
BTMP801.2	Develop competence in research design and planning
BTMP801.3	Perform analytical techniques/experimental methods to obtain objective-oriented results
BTMP801.4	Acquire research report writing skills

Matrix for Program Outcome and Program Specific Outcome

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BTMP801.1	3	3	3	3	1	2	2	2	3	3	2	3	3	3	3
BTMP801.2	3	3	3	3	2	2	2	2	3	3	3	3	2	3	2
BTMP801.3	3	3	3	3	3	3	2	3	3	3	3	3	2	2	3
BTMP801.4	2	2	2	2	2	2	2	3	3	3	3	3	3	2	2

1: As regards the assessment of the students with exceptional achievements/performance in games and sports, performing/ fine arts, Social Work, NCC, or other similar subjects/ category is concerned, the same can be defined/prescribed based on their level of competition (State level/ National level/International level/ Commonwealth/ Olympics/ World Championships etc), the level of representation (District/ State/ National/ International), medal/distinction achieved in team/ individual events, and such exceptional performance shall be treated equivalent to an assessment.

SYLLABUS FOR B. TECH. BIOTECHNOLOGY

Note 2: Following approved Value-added courses will be offered besides the above for 1 credit. Courses will be offered as per the approved eligibility. Evaluation will be for 50 marks.

- Essentials of research concept and practices
- Art of Hydroponics
- Organic Farming

Course Environmental
Biotechnology

Graduate Attributes On
Environment and Sustainability

DPU

Dr. D.Y. PATIL VIDYAPEETH, PUNE
(DEEMED UNIVERSITY)

DR. D. Y. PATIL VIDYAPEETH

PUNE - 411 018

**GLOBAL BUSINESS SCHOOL
AND RESEARCH CENTRE**

TATHAWADE, PUNE

**SYLLABUS FOR
MASTER OF BUSINESS ADMINISTRATION
(M.B.A)**

Academic Batch : 2022-24

ABOUT INSTITUTE:

Global Business School & Research Centre (GBSRC) situated at Tathwade, Pune is the flagship institute of Dr. D Y Patil Vidyapeeth, Pune. It was established in 2006. In a span of 16 years, the Institute has carved a name for itself amongst the top business schools of the country.

The Government of India, Ministry of Human Resource Development, on the advice of UGC, declared Dr. D. Y. Patil Vidyapeeth, Pune as deemed-to-be university comprising of Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune vide its notification dated 11th January, 2003.

The Dr. D. Y. Patil Vidyapeeth, Pune has been Re-accredited by NAAC with a CGPA of 3.62 on a four point scale at 'A' grade on 3rd March, 2015, valid up to 2nd March 2020. The Dr. D. Y. Patil Vidyapeeth, Pune is also an ISO 9001: 2015 Certified University.

Under National Institutional Ranking Framework (NIRF) 2020, conducted by Ministry of Human Resource Development (MHRD), New Delhi, the Dr. D. Y. Patil Vidyapeeth, Pune has ranked 3rd in Dental Category, 24th in Medical Category, 46th in University Category and 75th in Overall Category in India.

Vision:

To be a globally recognized management institution that continually responds to changing business paradigms through research and academic excellence to nurture responsible business leaders.

Mission:

1. To become a globally recognized management institution through knowledge creation, dissemination and application
2. To enhance academic excellence in consulting, training, research and teaching through a holistic approach
3. To develop leaders, Entrepreneurs and policy makers through transformative education

Name of the Programme: Master of Business Administration (MBA)

Nature of the Programme: MBA is TWO YEAR FULL TIME Post-Graduate Degree Programme approved by AICTE with an intake of 240 students.

The revised curriculum for MBA is developed to bring into line the programme structure and course contents with student aspirants and corporate expectations. There was a need for revision of the curriculum in view of the global aspects of businesses and economies, vigor in the industry practices, developments in technology, appearance of new business and organizational Contents s and the developing prospects of key stakeholders viz. Students, Industry and Faculty members at large.

Exclusively the following expertise place are in focus:

1. Problem Definition and Analytical Skills
2. Relevance of Technology Tools

3. Quantitative Aspects
4. Ability to Work in groups
5. Communication Skills
6. Reading and Listening Skills
7. Cross- Cultural Skills

MBA Programme Education Objectives : The objective of the MBA programme is to educate and prepare a varied group of aspirants with the knowledge, analytical ability and management perspectives and skills needed to provide leadership to organizations competing in a world increasingly characterized by diversity in the workforce, rapid technological change and a severely competitive global marketplace. It displays competencies and knowledge in key business functional areas including accounting, finance, marketing, human resource, operations, logistics, supply chain, international business, analytics etc.

Specifically, the objectives of the MBA programme are:

1. Demonstrate global and cross cultural understanding for exploring **innovative business practices** to enhance profitability.
2. Exhibit **leadership skills** in diversified and multidisciplinary areas.
3. Practice **analytical and problem solving competencies** in various facets of management.
4. **Communicate effectively** with all stakeholders of the organization and society.
5. Exhibit **entrepreneurial skills**.
6. Take **ethical decisions** in day to day activities.

Pattern: The Programme comprises of 4 semesters and adopts the Choice Based Credit System (CBCS) and Grading System. Each semester includes the core subjects and also value added activities like Personality development, Corporate Grooming; Skill Developments etc.

Semester	Credits
I	27
II	27
III	31
IV	19
Total	104

COURSE STRUCTURE : SINGLE SPECIALIZATION

SEMESTER : I

Course Code	Course Title	Marks		Total	Credits	No. of Sessions			Total Sessions (hrs)
		Internal	External			L	T	P	
MB101	Principles And Practices of Management	50	50	100	3	40	5	-	45
MB102	Organizational Behavior	50	50	100	3	40	5	-	45
MB103	Accounting for Business Decisions	50	50	100	3	40	5	-	45
MB104	Managerial Economics	50	50	100	3	40	5	-	45
MB105	Basics of Marketing	50	50	100	3	40	5	-	45
MB106	Business Law	50	50	100	3	40	5	-	45
MB107	Statistics and Quantitative Techniques	50	50	100	3	40	5	-	45
MB108	Business Communication	50	50	100	3	40	5	-	45
MB109	Domain Elective -I (Only 1)								
I	Introduction to Agribusiness Management	50	50	100	2	25	5	-	30
II	Introduction to Finance								
III	Personnel Administration and Documentation								
IV	Introduction to Pharmaceutical Business Environment								
V	Introduction to Life Sciences, Biotechnology and Bioinformatics								
VI	Introduction to IT								
VII	Introduction to International Business								
VIII	Healthcare and Hospital Management								
IX	Introduction to Operations and Supply Chain Management								
X	Introduction to Business Analytics								
MB110	Disaster Management	-	-	-	1	10	3	2	15
Total				900	27				

SEMESTER : II

Course Code	Course Title	Marks		Total	Credits	No. of Sessions			Total Sessions (hrs)
		Internal	External			L	T	P	
MB201	Marketing Management	50	50	100	3	40	5	-	45
MB202	Financial Management	50	50	100	3	40	5	-	45
MB203	Human Resource Management	50	50	100	3	40	5	-	45
MB204	Operations Management	50	50	100	3	40	5	-	45
MB205	Research Methodology for Managers	50	50	100	3	40	5	-	45
MB206	Data Analytics	50	50	100	3	40	5	-	45
MB207	Emotional and Spiritual Intelligence for Managerial Effectiveness	50	50	100	3	40	5	-	45
MB208	Entrepreneurship Development and Project Management	50	50	100	3	40	5	-	45
MB208A	Entrepreneurship Development in Agri sector (Only for ABM Specialization instead of MB 208)	50	50	100	3	40	5	-	45
MB209	Domain Elective -II (Only 1)								
I	Management of Agriculture and Allied sciences	50	50	100	2	25	5	-	30
II	Financial Markets and Services								
III	Training and Development								
IV	Pharmaceutical Management								
V	Application and Methodology of Biotechnology								
VI	IT in Business Management								
VII	Export and Import Management								
VIII	Hospital Administrations								
IX	Production and Operations Management								
X	Applications of Business Analytics								
MB210	Industry Sectoral Analysis	-	-	-	1	10	3	2	15
Total				900	27				

SEMESTER: III

Course Code	Course Title	Marks		Total	Credits	No. of Sessions			Total Sessions (hrs)
		Internal	External			L	T	P	
MB301	Strategic Management	50	50	100	3	40	5	-	45
MB302	Start Up and New Venture Management	50	50	100	3	40	5	-	45
Choice of any 6 Courses from MB303 To MB309									
MB303	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB304	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB305	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB306	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB307	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB308	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB309	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB310	Introduction to Cyber Security	-	-	-	1	10	3	2	15
MB311	Summer Internship Project (SIP)	50	50	100	6	-	-	-	60 Days
Total				900	31				

SEMESTER : IV

Course Code	Course Title	Marks		Total	Credits	No. of Sessions			Total Sessions (hrs)
		Internal	External			L	T	P	
Choice of any 5 Courses from MB401 To MB407									
MB401	Specialization Paper Cases in Management (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB402	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB403	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
Course Code	Course Title	Marks		Total	Credits	No. of Sessions			Total Sessions (hrs)
		Internal	External			L	T	P	
MB404	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB405	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB406	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB407	Specialization Paper (A/B/C/D/E/F/G/H/I/J/K)	50	50	100	3	40	5	-	45
MB408	Business Ethics	-	-	-	1	10	3	2	15
MB409	Design Thinking	50	50	100	3	40	5	-	45
Total				600	19				

GRADUATE ATTRIBUTES

Management Graduates are expected to have the following attributes :

1. Professional with comprehensive knowledge of Management Sciences and competence in business sustainability, profitability, entrepreneurship and commercializing new business/products.
2. Problem solver with critical thinking and decision making skills to identify, analyze and solve complex business problems.
3. Effective communicator with professional colleagues and society at large.
4. Researcher with ability to conduct management research of highest standards and make significant contribution to innovative management practices.
5. Ethical and professional in conduct of research and accountability towards community and profession.
6. Leader who works in teams, exhibits leadership qualities, soft skills and technical skills to enhance business performance, including multidisciplinary settings.
7. Socially responsive with ability to recognize and respond to community problems and need for improving management practices, particularly healthcare/agricultural/corporate sectors.
8. Action oriented and active contributor to environment conservation and sustainability practice through innovation and best practices.
9. Lifelong learner who learns new knowledge and skills in a continuous self directed manner and as per need of the time.

Programme Outcomes and Programme Specific Outcomes [POs & PSOs]

POs	Attributes	Statement/Definition
1.	Knowledge and Skills	Acquire managerial knowledge and skills for effective decision making.
2.	Planning and Problem-Solving abilities	Exercise planning for accomplishing organizational goals and develop problem solving abilities in the functional areas of management.
3.	Communication	Develop effective business communication with the use of advanced technology.
4.	Research Aptitude	Develop research aptitude for developing solutions to business problems.
5.	Professionalism and Ethics	Acquire professional approaches and understand ethical responsibilities in business organizations.

POs	Attributes	Statement/Definition
6.	Leadership	Demonstrate leadership qualities that maximize the use of diverse skills of team members towards attainment of the goals.
7.	Societal Responsibilities	Learn and accept social responsibilities and working for the welfare of the society at large.
8.	Environment and Sustainability	Understand the effect of organizational interventions in environmental contexts and the acquaintance for sustainable development.
9.	Lifelong Learner	Engage in life-long learning in order to upgrade self-knowledge, skills and experience for enhancement of outcomes.
PSOs		
1.	PSO1	Demonstrate proficiency in one of the following specialized areas of Management such as: a) Marketing Management b) Agribusiness Management c) Financial Management d) Human Resource Management e) Pharmaceutical Management f) Biotech and Bioinformatics Management g) IT and Systems Management h) International Business Management i) Hospital & Healthcare Management j) Operations and Supply Chain k) Business Analytics
2.	PSO2	To inculcate the ability to gain multidisciplinary knowledge through simulated problems, case analysis, projects-based Learnings, Internships, Corporate Sessions, Seminars, Conferences and Choice based credit system.

EVALUATION SYSTEM

Pattern of Examination :

The 'Evaluation Scheme' comprises of Concurrent (Continuous) Evaluation & University Evaluation. The 'Evaluation Scheme' for ' 2 Credit', '3 Credit', and '6 Credit' courses will be as follows :

Sr. No.	Course	Concurrent Evaluation (Internal)	University Evaluation (External)	Total Marks
1	2 Credit	50%	50%	100
2	3 Credit	50%	50%	100
3	6 Credit	50%	50%	100

Project Evaluation :

Sr. No.	Courses	Duration	Assessment of Project Work & Report	Viva Voce	Total Marks
1	Project	2 months (60 Days)	50 Marks	50 Marks	100 Marks

ACADEMIC RESULT AND GRADING SCHEME :

Passing Percentage:

The passing criteria comprises of the following:

Every student must secure minimum 40% marks in both internal evaluation and external evaluation independently.

GBSARC MBA Syllabus

INDEX
SINGLE SPECIALIZATION

COURSE CODE	COURSE NAME	PAGE NO.
SEMESTER: I		
MB101	Principles and Practices of Management	22
MB102	Organizational Behavior	24
MB103	Accounting for Business Decisions	26
MB104	Managerial Economics	28
MB105	Basics of Marketing	30
MB106	Business Law	32
MB107	Statistics and Quantitative Techniques	34
MB108	Business Communication	36
MB109	Domain Elective I (Only 1)	
I	Introduction to Agribusiness Management	38
II	Introduction to Finance	40
III	Personnel Administration and Documentation	42
IV	Introduction to Pharmaceutical Business Environment	44
V	Introduction to Life Sciences, Biotechnology and Bioinformatics	46
VI	Introduction to IT	48
VII	Introduction to International Business	50
VIII	Healthcare and Hospital Management	52
IX	Introduction to Operations and Supply Chain Management	54
X	Introduction to Business Analytics	56
MB110	Disaster Management	58
SEMESTER: II		
MB201	Marketing Management	61
MB202	Financial Management	63
MB203	Human Resource Management	65
MB204	Operations Management	67
MB205	Research Methodology for Managers	69
MB206	Data Analytics	71

COURSE CODE	COURSE NAME	PAGE NO.
MB207	Emotional and Spiritual Intelligence for Managerial Effectiveness	73
MB208	Entrepreneurship Development and Project Management	75
MB208A	Entrepreneurship Development in Agri sector (Only for ABM Specialization instead of MB 208)	77
MB209	Domain Elective II (Only 1)	
I	Management of Agriculture and Allied sciences	79
II	Financial Markets and Services	81
III	Training and Development	83
IV	Pharmaceutical Management	85
V	Application and Methodology of Biotechnology	87
VI	IT in Business Management	89
VII	Export and Import Management	91
VIII	Hospital Administrations	93
IX	Production and Operations Management	95
X	Applications of Business Analytics	97
MB210	Industry Sectoral Analysis	99

SEMESTER III

MB301	Strategic Management	101
MB302	Start Up and New Venture Management	103

MARKETING MANAGEMENT SPECIALIZATION

Select Any 6 Courses from MB303 To MB309		
MB303A	Specialization Paper (A): Sales & Distribution Management	105
MB304A	Specialization Paper (A): Digital Marketing	107
MB305A	Specialization Paper (A): Product & Brand Management	109
MB306A	Specialization Paper (A): Consumer Behaviour	111
MB307A	Specialization Paper (A): Integrated Marketing Communications	113
MB308A	Specialization Paper (A): Marketing Research	115
MB309A	Specialization Paper (A): Rural Marketing	117

AGRIBUSINESS MANAGEMENT SPECIALIZATION

COURSE CODE	COURSE NAME	PAGE NO.
Select Any 6 Courses from MB303 To MB309		
MB303B	Specialization Paper (B): Current Trends in Agri Business Management	119
MB304B	Specialization Paper (B): Livestock Management and Fodder Technology	121
MB305B	Specialization Paper (B): Management of Agricultural Engineering Business	123
MB306B	Specialization Paper (B): Marketing of Agri -Inputs & Outputs	125
MB307B	Specialization Paper (B): Post-harvest technology & Management	127
MB308B	Specialization Paper (B): Agri Import & Export Management	129
MB309B	Specialization Paper (B): Emerging Trends in Organic Farming	131

FINANCIAL MANAGEMENT SPECIALIZATION

Select Any 6 Courses from MB303 To MB309		
MB303C	Specialization Paper (C): Advanced Corporate Finance	133
MB304C	Specialization Paper (C): Fixed Income Securities	135
MB305C	Specialization Paper (C): Financial Derivatives	137
MB306C	Specialization Paper (C): Taxation	139
MB307C	Specialization Paper (C): Security Analysis & Portfolio Management	141
MB308C	Specialization Paper (C): Analysis of Financial Statements	143
MB309C	Specialization Paper (C): Financial Technology	145

HUMAN RESOURCE MANAGEMENT SPECIALIZATION

Select Any 6 Courses from MB303 To MB309		
MB303D	Specialization Paper (D): Human Resource Planning	147
MB304D	Specialization Paper (D): Talent Acquisition and Staffing	149
MB305D	Specialization Paper (D): Human Resource Development	151
MB306D	Specialization Paper (D): Performance & Compensation Management	153
MB307D	Specialization Paper (D): Labour Laws	155
MB308D	Specialization Paper (D): Strategic HRM	157
MB309D	Specialization Paper (D): HR Analytics	159

PHARMA MANAGEMENT SPECIALIZATION

COURSE CODE	COURSE NAME	PAGE NO.
Select Any 6 Courses from MB303 To MB309		
MB303E	Specialization Paper (E): Anatomy, Physiology and Health Education	161
MB304E	Specialization Paper (E): Management of Multinational Pharmaceuticals	163
MB305E	Specialization Paper (E): Business Leadership in Pharma	165
MB306E	Specialization Paper (E): Pharma Product & Brand Management	167
MB307E	Specialization Paper (E): Pharma Sales, Distribution & Retail Management	169
MB308E	Specialization Paper (E): Pharmaceutical Manufacturing & regulatory Affairs	171
MB309E	Specialization Paper (E): Pharmaceutical Management Information System	173

BIOTECHNOLOGY AND BIOINFORMATICS SPECIALIZATION

Select Any 6 Courses from MB303 To MB309		
MB303F	Specialization Paper (F): Principles of Immunology	175
MB304F	Specialization Paper (F): Computational Biology and Bioinformatics	177
MB305F	Specialization Paper (F): Intellectual Property rights and Technology Transfer in Biotechnology	179
MB306F	Specialization Paper (F): Food technology and fundamentals of production planning	181
MB307F	Specialization Paper (F): Ethics, biosafety and hazard management in biotechnology	183
MB308F	Specialization Paper (F): Environmental biotechnology and environment management	185
MB309F	Specialization Paper (F): Fundamentals of Nanotechnology	187

IT AND SYSTEMS MANAGEMENT SPECIALIZATION

Select Any 6 Courses from MB303 To MB309		
MB303G	Specialization Paper (G): Cloud Computing	189
MB304G	Specialization Paper (G): Software Quality Management	192
MB305G	Specialization Paper (G): E-Business and Business Intelligence	194
MB306G	Specialization Paper (G): E- Commerce & Social Media Marketing	196
MB307G	Specialization Paper (G): Database Management System	198

MB308G	Specialization Paper (G): Supply Chain Management Information Systems	200
MB309G	Specialization Paper (G): Software Project Management	202

INTERNATIONAL BUSINESS MANAGEMENT SPECIALIZATION

Select Any 6 Courses from MB303 To MB309		
MB303H	Specialization Paper (H): International Business Environment and Trade Institutions	204
MB304H	Specialization Paper (H): International Business Economics	206
MB305H	Specialization Paper (H): Emerging Trends in International Business	208
MB306H	Specialization Paper (H): International Trade, WTO & Trade Policy issues	210
MB307H	Specialization Paper (H): Intellectual Property Rights	212
MB308H	Specialization Paper (H): International Banking	214
MB309H	Specialization Paper (H): International Logistics & Supply Chain Management	216

HOSPITAL AND HEALTHCARE MANAGEMENT SPECIALIZATION

Select Any 6 Courses from MB303 To MB309		
MB303I	Specialization Paper (I): Medical Tourism and Transnational Healthcare	218
MB304I	Specialization Paper (I): Management of Mediciclaim and TPAs in Hospitals	220
MB305I	Specialization Paper (I): Essentials for Training & Development for Healthcare Professionals	222
MB306I	Specialization Paper (I): Community Health Management	224
MB307I	Specialization Paper (I): Laws Related to Hospital & Medical Services	225
MB308I	Specialization Paper (I): Management of Hospital information System	227
MB309I	Specialization Paper (I): Quality & Accreditation in Healthcare Sector	229

OPERATIONS AND SUPPLY CHAIN MANAGEMENT SPECIALIZATION

Select Any 6 Courses from MB303 To MB309		
MB303J	Specialization Paper (J): Inventory Management	231
MB304J	Specialization Paper (J): Quality Management	233
MB305J	Specialization Paper (J): Service Operations Management	235
MB306J	Specialization Paper (J): Operations Research & Management	237

MB307J	Specialization Paper (J): Logistics Management	239
MB308J	Specialization Paper (J): Supply Chain Management	241
MB309J	Specialization Paper (J): Operations Strategy	243

BUSINESS ANALYTICS SPECIALIZATION

Select Any 6 Courses from MB303 To MB309

MB303K	Specialization Paper (K): Workforce Analytics	245
MB304K	Specialization Paper (K): Analytics for Marketing	248
MB305K	Specialization Paper (K): Retail Analytics	250
MB306K	Specialization Paper (K): Analytics for Business Functions	252
MB307K	Specialization Paper (K): Performing Analytics with Python	254
MB308K	Specialization Paper (K): Machine Learning with R Programming	255
MB309K	Specialization Paper (K): Descriptive Analytics and Data Visualization (Using Tableau)	257
MB310	Introduction to Cyber Security	259
MB311	Summer Internship Project (SIP)	262

SEMESTER IV

MARKETING MANAGEMENT SPECIALIZATION

Select Any 5 Courses from MB401 To MB407

MB401A	Specialization Paper (A): Cases in Management (Marketing)	266
MB402A	Specialization Paper (A): Services Marketing	268
MB403A	Specialization Paper (A): B2B Marketing	270
MB404A	Specialization Paper (A): Retail Management	272
MB405A	Specialization Paper (A): International Marketing	277
MB406A	Specialization Paper (A): Strategic Marketing	276
MB407A	Specialization Paper (A): Marketing of Financial Services	278

AGRIBUSINESS MANAGEMENT SPECIALIZATION

COURSE CODE	COURSE NAME	PAGE NO.
Select Any 5 Courses from MB401 To MB407		
MB401B	Specialization Paper (B): Cases in Management (Agribusiness)	280
MB402B	Specialization Paper (B): Agricultural Economic	282

MB403B	Specialization Paper (B): Framework of ICT in Agribusiness Management	284
MB404B	Specialization Paper (B): Rural Credit & Urban Finance for Agriculture	286
MB405B	Specialization Paper (B): Procurement and Warehouse Management	288
MB406B	Specialization Paper (B): Management of Agri Cooperatives	290
MB407B	Specialization Paper (B): Agricultural Risk Management and Crop Insurance	292

FINANCIAL MANAGEMENT SPECIALIZATION

Select Any 5 Courses from MB401 To MB407		
MB401C	Specialization Paper (C): Cases in Management (Finance)	294
MB402C	Specialization Paper (C): Corporate Financial Restructuring	296
MB403C	Specialization Paper (C): Equity Research	298
MB404C	Specialization Paper (C): Financial Modelling	200
MB405C	Specialization Paper (C): Insurance and Risk management	302
MB406C	Specialization Paper (C): Strategic Financial Management	304
MB407C	Specialization Paper (C): Behavioral Finance	306

HUMAN RESOURCE MANAGEMENT SPECIALIZATION

Select Any 5 Courses from MB401 To MB407		
MB401D	Specialization Paper (D): Cases in Management (HR)	308
MB402D	Specialization Paper (D): Knowledge Management	310
MB403D	Specialization Paper (D): HR Perspectives in Mergers & Acquisitions	312
MB404D	Specialization Paper (D): Organizational Change & Development	314
MB405D	Specialization Paper (D): International HRM	316
MB406D	Specialization Paper (D): Talent Retention & Employee Engagement	318
MB407D	Specialization Paper (D): Competency Mapping and Career Development	320

PHARMA MANAGEMENT SPECIALIZATION

COURSE CODE	COURSE NAME	PAGE NO.
Select Any 5 Courses from MB401 To MB407		
MB401E	Specialization Paper (E): Cases in Management (Pharma)	322

MB402E	Specialization Paper (E): Advertising and Service Management in Pharmaceutical Industry	324
MB403E	Specialization Paper (E): Pharma and Healthcare Management	326
MB404E	Specialization Paper (E): Intellectual Property rights & Legal aspects in Pharmaceutical Industry	328
MB405E	Specialization Paper (E): Pharmaceutical Export Management	330
MB406E	Specialization Paper (E): Marketing strategy and product launch Dynamics	332
MB407E	Specialization Paper (E): Pharmaceutical Advance Human Resource Management	334

BIOTECHNOLOGY AND BIOINFORMATICS SPECIALIZATION

Select Any 5 Courses from MB401 To MB407		
MB401F	Specialization Paper (F): Cases in Management (Biotech & Bioinformatics)	336
MB402F	Specialization Paper (F): Biotechnology Social, Legal and Ethical Issues	338
MB403F	Specialization Paper (F): Biotech Industry and Post Pandemic Resilience Management	340
MB404F	Specialization Paper (F): Fermentation Technology and Industrial Biotechnology	342
MB405F	Specialization Paper (F): Advances in Biotechnology and Bioinformatics	344
MB406F	Specialization Paper (F): Agricultural Biotechnology	346
MB407F	Specialization Paper (F): Biotechnology and Pharma Plant Management	348

IT AND SYSTEMS MANAGEMENT SPECIALIZATION

Select Any 5 Courses from MB401 To MB407		
MB401G	Specialization Paper (G): Cases in Management (IT & Systems Management)	350
MB402G	Specialization Paper (G): E- Governance and Framework of ICT	352
MB403G	Specialization Paper (G): E-Learning Tools and Methods	354
MB404G	Specialization Paper (G): Innovation and Technology Management	356
MB405G	Specialization Paper (G): Marketing of Information Technology	358
MB406G	Specialization Paper (G): Knowledge Management System	360
MB407G	Specialization Paper (G): Enterprise Resource Planning	362

INTERNATIONAL BUSINESS MANAGEMENT SPECIALIZATION

Select Any 5 Courses from MB401 To MB407		
MB401H	Specialization Paper (H): Cases in Management (International Business Management)	364
MB402H	Specialization Paper (H): Legal Framework for International Business	366
MB403H	Specialization Paper (H): Global Market Research	368
MB404H	Specialization Paper (H): International Marketing	370
MB405H	Specialization Paper (H): International Finance & Forex Management	372
MB406H	Specialization Paper (H): International Business Strategy	374
MB407H	Specialization Paper (H): Export Import Procedures & Documentation	376

HOSPITAL AND HEALTHCARE MANAGEMENT SPECIALIZATION

Select Any 5 Courses from MB401 To MB407		
MB401I	Specialization Paper (I): Cases in Management (Hospital & Health Care Management)	378
MB402I	Specialization Paper (I): Financial Management of Hospital and Healthcare Organizations	380
MB403I	Specialization Paper (I): Introduction to Artificial Intelligence in Healthcare	382
MB404I	Specialization Paper (I): Management of Corporate Hospitals	384
MB405I	Specialization Paper (I): Hospital Waste & Hygiene Management	385
MB406I	Specialization Paper (I): Marketing of Hospital & Health Care Services	387
MB407I	Specialization Paper (I): Planning & Management of Hospital Clinical & Supportive Services	389

OPERATIONS AND SUPPLY CHAIN MANAGEMENT SPECIALIZATION

Select Any 5 Courses from MB401 To MB407		
MB401J	Specialization Paper (J): Cases in Management (Operations & Supply Chain Management)	391
MB402J	Specialization Paper (J): Warehouse Management	393
MB403J	Specialization Paper (J): Lean Management	395
MB404J	Specialization Paper (J): Management of Manufacturing system	397
MB405J	Specialization Paper (J): Project Management	399
MB406J	Specialization Paper (J): Innovation & R & D Management	401
MB407J	Specialization Paper (J): World Class Manufacturing	403

BUSINESS ANALYTICS SPECIALIZATION

Select Any 5 Courses from MB401 To MB407		
MB401K	Specialization Paper (K): Cases in Management (Business Analytics)	405
MB402K	Specialization Paper (K): Artificial Intelligence in Business Applications	407
MB403K	Specialization Paper (K): Supply Chain Analytics	410
MB404K	Specialization Paper (K): Data Visualization for Managers	412
MB405K	Specialization Paper (K): Security & Master Data Management	414
MB406K	Specialization Paper (K): Internet of Things	416
MB407K	Specialization Paper (K): Social Media, Web & Text Analytics	418
MB408	Business Ethics	420
MB409	Design Thinking	422

GBSRC MBA Syllabus



**GLOBAL BUSINESS SCHOOL AND RESEARCH CENTRE
DR. D. Y. PATIL VIDYAPEETH, PUNE**

(Accredited (3rd Cycle) by NAAC with a CGPA of 3.64 on four point scale at 'A++' grade)
(An ISO 9001:2015 & 14001 :2015 Certified University)

Name of the Programme : MBA

Name of Semester : SEMESTER I

COURSE CODE	MB101
COURSE TITLE	PRINCIPLES AND PRACTICES OF MANAGEMENT
COURSE CREDITS	3

Course Description :

Students examine basic framework for understanding the role and functions of management and an explanation for the principles, concepts and techniques that can be used in carrying out these functions. Topics include planning, organizing, staffing, leading and controlling, as well as decision-making and managing change

Course Objectives:

1. To expose the students to basic concepts of management.
2. To enable them to gain appreciation for emerging ideas, techniques, procedures and practices in the field of management.

Course Outcomes : On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
101.1	Remember	STATE various concepts, models, objectives, principles and theories of Management.
101.2	Understand	EXPLAIN how organizations adapt to an uncertain environment and identify techniques managers use to influence and control the internal environment.
101.3	Apply	DEMONSTRATE the process of management's four functions: planning, organizing, leading, and controlling.
101.4	Analyze	RELATE the leadership styles to anticipate the consequences of each leadership style.
101.5	Evaluate	APPRAISE and analyze social responsibility and ethical issues involved in business situations and logically articulate own position on such issues.
101.6	Create	FORMULATE the policies to communicate the management concepts and how it will affect future managers.

Course Contents:

Unit 1 : Introduction to Management

Definition of Management, Management: Science, Theory and Practice- Development of Management Thought Contribution of Taylor and Fayol Management and Society : The External Environment, Managerial skills, Functions of Management, Business Ethics and Social Responsibility - Global and Comparative Management.

Unit 2 : Planning

Planning - Steps in Planning Process - Scope and Limitations - Short Range and Long Range Planning - Objectives, Setting Objectives, Flexibility in Planning –Characteristics of a sound Plan - Management by Objectives (MBO) - Policies and Strategies - Scope and Formulation - Decision Making - Techniques and Processes.

Unit 3 : Organising

Organising - Organisation Structure and Design - Authority and Responsibility Relationships -

Delegation of Authority and Decentralisation - Interdepartmental Coordination - Emerging Trends in Corporate Structure, Strategy and Culture - Impact of Technology on Organisational design - Mechanistic vs Adoptive Structures - Formal and Informal Organisation-Departmentation, staffing – selection process – techniques- HRD.

Unit 4 : Directing and Controlling

Directing: Scope, Human Factors, Creativity and Innovation, Harmonizing Objectives, Leadership styles, Types of Leadership Motivation, Hierarchy of Needs, Motivation theories, Motivational Techniques, The System and Process of Controlling - Control Techniques and Information Technology - Requirements for effective control, The Budget as Control Technique, Productivity, Problems and Management, Control of Overall Performance, Direct and Preventive Control, Reporting.

Unit 5 : Management practices

Comparative Management Styles and approaches - Japanese Management Practices Organisational Creativity and Innovation - Management of Innovation - Entrepreneurial Management - Benchmarking - Best Management Practices across the world - Select cases of Domestic and International Corporations - Management of Diversity.

Suggested Readings:

1. Wehrich Heinz and Koontz Harold - Management: A Global and Entrepreneurial Perspective (Mc Graw Hill, 12th Edition 2008).
2. Stoner, Freeman and Gilbert Jr - Management (Prentice Hall of India, Latest Edition).
3. Bateman, Management (SIE), Tata McGraw-Hill Publishing Company, New Delhi.
4. Fraidon Mazda, “ Engineering Management”, Addison Wesley, 2000.
5. Hillier Frederick S. and Hillier Mark S. - Introduction to Management Science: A Modeling and Case Studies Approach with Spreadsheets (Tata Mc Graw Hill, 2nd Edition 2008).
6. JAF Stomer, Freeman R. E and Daniel R Gilbert Management, Pearson Education, Sixth Edition, 2004.
7. Koontz - Principles of Management (Tata Mc Graw Hill, 1st Edition 2008).
8. Massie, Joseph L., Essentials of Management, Pearson Education.
9. Robbins and Coulter - Management (Prentice Hall of India, 8th Edition).
10. Robbins S.P. and Decenzo David A. - Fundamentals of Management: Essential Concepts and Applications (Pearson Education, 5th Edition).
11. Tripathy PC and Reddy PN, “Principles of Management”, Tata McGraw-Hill, 1999.

COURSE CODE	MB102
COURSE TITLE	ORGANISATIONAL BEHAVIOUR
COURSE CREDITS	3

Course Description :

This course serves as an introduction to the field of organizational behaviour (OB) and provides a foundation for other OB courses offered in the Faculty of Business. It covers a wide breadth of theories and applications dealing with such topics as perception, motivation, decision making, team dynamics, negotiation, conflict management, leadership, and organizational culture. Twelve lessons, covering twelve chapters in the textbook, are presented in a logical order to create a sense of progression for the students. Each lesson builds upon previous lessons by starting at the individual level, then moving on to a team level, and finally adopting an organization-wide level of analysis.

The goal of this course is to help you develop a conceptual understanding of OB theories and provide you with skills to put those ideas and theories into practice. Key techniques and processes designed to improve organizational efficiency and effectiveness are fully examined from the perspective of management, workers, and society at large.

Course Objectives :

1. To understand the concepts of organizational behavior and its application in managing people.
2. To understand individual behavior in organization including Personality, Attitude, Motivation.
3. To understand group behavior in organizations, including Group Dynamics, Teams, Conflict Management, stress management and change management.
4. To understand the basic concepts and functions of management.
5. To identify the key competencies needed to be an effective Manager.

Course Outcomes : On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
102.1	Remember	STATE the conceptual framework of the discipline of OB and its practical applications in the organizational set up.
102.2	Understand	EXPLAIN the role of individual, groups and structure in achieving organizational goals effectively and efficiently.
102.3	Apply	DEMONSTRATE different motivational theories and methods to increase the productivity and job satisfaction of employees.
102.4	Analyze	EXAMINE effective techniques for managing conflict in changing business environment.
102.5	Evaluate	Critically EVALUATE and analyses theories and models that contribute to the discipline's overall understanding.
102.6	Create	Recognize stress in the workplace and DEVELOP programs to successfully reduce stress in employees.

Course Contents :

Unit 1: Introduction to Organizational Behavior and Perception Process

Definition, Concept and Importance, Different models of OB - autocratic, custodial, supportive, collegial and SOBC, Models of OB, Nature and Importance, Relationship between management and organisational behaviour.

Unit 2 : Individual level behavioral variables – 1 (Personality, Perception)

Introduction, Personality- Definition and Determinants, Personality Traits, Personality Theories(Psychoanalytic Theory, Socio-Psychological Theory, Trait Theory,Self Theory). Perception : Nature and Importance, Perceptual Selectivity, Perceptual Organization, Social Perception.

Unit 3 : Individual level behavioral variables – (Values, Attitudes Motivation and Learning):

Introduction, Values, Attitudes, Theories of Attitude(Cognitive-Consistency Theories Functional Theories, Social Judgment Theories) Definition and Importance of Motivation, Early Theories in Motivation (Maslow's Hierarchy of Needs Theory, McGregor's Theory X and Theory Y, Herzberg's Two-Factor Theory) Contemporary Theories in Motivation(ERG Theory,McClelland's Theory of Needs, Goal-Setting Theory). Introduction, Types of Behavioural learning, Learning and its Applications in Organizations.

Unit 4 : Group level behavioral (The group):

Introduction, Concept of Groups, Stages of Group Formation and Group Process, Definition and Overview of a Team, Seventeen Characteristics of an Effective Team, Conflict Management-Traditional vis-à-vis Modern view of conflict, Constructive and Destructive conflict, Conflict Process, Levels of Conflict, Strategies for Conflict resolution.

Unit 5 : Stress management, Change management:

Concept of stress, Sources of Stress, Effect of stress, Work life balance, Concept of Change, Forces Responsible for Change, Resistance to change, Change process, Lewin's Change model, Force Field Analysis.

Prescribed Books:

1. Harold Koontz and Heinz Weihrich, Essentials of Management, Tata McGraw-Hill, 6th Edition
2. Stephen P. Robbins, Organizational Behavior, Prentice Hall of India, 9th Edition,

Suggested Readings:

1. Jit S.Chand, Organisational Behavior, Vikas Publishing House Pvt.Ltd.Saxena., Principles and Practice of Management

COURSE CODE	MB103
COURSE TITLE	ACCOUNTING FOR BUSINESS DECISIONS
COURSE CREDITS	3

Course Description:

Accounting is the language of business. The performance of a business is evaluated by interpreting its financial statements. This course discusses the scope of accounting function and its role in modern business as a tool for decision making. The course emphasizes the construction of the basic financial accounting statements - the income statement, balance sheet, as well as their interpretation. Preparation of financial statements is taught both from the perspective of sole trader and the company form of business. Topics on decision techniques such as PV ratio, BEP, and Budget are also included.

Course Objectives:

1. To understand systematic procedure of recording business transactions.
2. To understand comprehensive process of preparation of financial statements of a company.
3. To develop the skills of preparation and presentation of information for management decision-making.
4. To interpret of accounting reports.
5. To demonstrate ability to comprehend Accounting and Costing concepts for decision making.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
103.1	Remember	DEFINE various fundamental concepts underlying Accounting and Financial Management for Business Decisions.
103.2	Understand	EXPLAIN concepts and conventions used in preparation of accounts.
103.3	Apply	MAKE USE OF Financial tools and techniques for management accounting in an organization.
103.4	Analyze	EXAMINE existing accounting decision making techniques in an organization.
103.5	Evaluate	SELECT appropriate decision making techniques in assessing financial health of the organization.
103.6	Create	DESIGN a framework of internal controls for mitigating the Financial risk.

Course Contents :

Unit 1: Introduction to Accounting

Definition of Accounting, Scope of Accounting, Basic Accounting Terminologies, Accounting concepts and conventions, Users of Accounting Information, Accounting Equation (including problems), Financial A/c Vs Management A/c, Cost Accounting Vs Management Accounting.

Unit 2: Accounting Cycle

Classification of Accounts as per Modern Approach, Preparation of Journal, Ledger, Trial Balance and Final Accounts, Problems on Final Accounts of Sole Trader with adjustment entries.

Unit 3: Corporate Reporting

Preparation of Income Statement and Balance Sheet as per Schedule III of the Companies Act 2013. Analysis of Chairman's report.

Unit 4: Introduction to Cost Accounting

Limitations of Financial Accounting, Meaning of Cost, Cost Accounting, Cost classification, Special Cost for management decision making, Elements of cost, Preparation of cost sheet.

Unit 5: Decision Making Techniques

Meaning of Marginal costing, Characteristics of Marginal Costing, Calculation of: BEP, Margin of Safety, P/V ratio, Budgetary Control: Meaning, process, functional & flexible budgets. Problems on Cash Budget.

Prescribed Books:

1. Paresh Shah: Basic Financial Accounting For Management, Oxford University Press.
2. Ramachandran, N. and Kakani, R.K. Financial Accounting for Management, Tata McGrawHill.
3. Bhattacharya, S.K, Accounting for Management : Text and Cases, Vikas Publishing House,
4. Bhattacharya, H., How to Read a Balance Sheet: Adapted to Indian laws and requirements Oxford and IBH Publishing Company Pvt.

GBSRC MBA Synopsis

COURSE CODE	MB104
COURSE TITLE	MANAGERIAL ECONOMICS
COURSE CREDITS	3

Course Description:

Managerial economics is a science that deals with the application of various economic theories, principles, concepts and techniques to business management in order to solve business and management problems. It deals with the practical application of economic theory and methodology to decision-making problems faced by private, public and non-profit making organizations

Course Objectives:

1. To gain knowledge of all the economic terms and concepts.
2. To understand the scenario of usage of the various concepts of economics.
3. To develop ability to apply the various micro and macro-economic variables to solve business problems.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
104.1	Remember	RECALL important concepts of economics which are used in making managerial decisions.
104.2	Understand	EXPLAIN concepts related to Demand analysis and Supply.
104.3	Apply	IDENTIFY market structure based on the market characteristics.
104.4	Analyze	EXAMINE Government interventions in the market.
104.5	Evaluate	ASSESS relevant government policies.
104.6	Create	ADAPT appropriate tools of managerial economics to suit Business situations

Course Contents:

Unit 1: Nature and scope of Managerial Economics

Definition, nature and scope of Managerial Economics, Managerial Economics and Micro-economics, Managerial Economics and Macro-economics, Applications of Economics in Managerial decisions making. Fundamental Economic Concepts: Positive and normative approach, Optimization, Marginal analysis, Opportunity Cost, Economic Model, Static and Dynamics.

Unit 2: Demand Analysis and Supply

Determinants of Market Demand, Law of Demand, Elasticity of Demand, Measurement and its use, Demand Forecasting. Supply: Supply Analysis Law of Supply, Determinants of market supply. Production Function and Cost Theory: Meaning of Production Function, Costs and Cost Functions, Short Terms Costs and their use on decision making, Determinants of costs, Break Even Analysis.

Unit 3: Pricing and Market structures

Pricing decisions under different market forms like perfect competition, monopoly, oligopoly, Pricing Methods - Pricing in Public Sector Undertakings and Cooperative Societies, Profit Concept, Theories of Profit.

Unit 4: Government and Business

Need for Government intervention in the market, Price Controls - Support Prices and Administered Prices, Prevention and control of monopoly, Protection of consumers' interest, Economic Liberalization, Process of disinvestments- Need and methods, Policy planning as a guide to overall business development.

Unit 5: National Income Accounting

Inflation, Money and Banking, Indian economy policy.

Prescribed Books:

1. Mote, Paul and Gupta, Managerial Economics, Tata McGraw-Hill, First Edition.
2. Warren E. Buffett, Fundamentals of Managerial Economics.

Suggested Readings:

1. R L Varshney and K L Maheswari, Managerial Economics, Sultan Chand and Sons, New Delhi, Eighteenth Edition.
2. Reckie and Crooke, Managerial Economics, Prentice Hall; fourth Edition.
3. Samuelson, Paul, Economics, Tata McGraw-Hill, Eighteenth Edition.

GBSRC MBA Syllabus

COURSE CODE	MB105
COURSE TITLE	BASICS OF MARKETING
COURSE CREDITS	3

Course Description :

This course is designed to provide students with an understanding of the principles of Marketing. There will be a focus on the management of the marketing activities and how marketing relates to overall organisational functioning, including the management of exchange processes between business units and consumers and between firms. It will include topics such as environmental analysis, industry and competitor analysis, objective setting, marketing strategies, market mix components, and finally implementation and control mechanisms. Additionally, the course will provide opportunities for the practical implementation of the concepts covered and the development of problem solving skills by means of face-to-face seminars and tutorials, online learning and a marketing practice simulation.

Course Objectives:

1. To introduce the marketing concept and how we identify, understand and satisfy the needs of customers and markets.
2. To distinguish between the specific nature of different markets, goods and services.
3. To understand the theories and practices behind the marketing mix variables.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
105.1	Remember	DEFINE the basic marketing concepts and elements of the marketing mix in content of global market.
105.2	Understand	DESCRIBE marketing concepts and distinguish between the specific nature of different markets, goods and services.
105.3	Apply	IMPLEMENT the various marketing framework to evaluate marketing decisions and initiatives.
105.4	Analyze	COMPARE between the current trend of business analytics and be aware of the ethical issues related to business analytics
105.5	Evaluate	JUDGE the difference between ethical and unethical marketing practices.
105.6	Create	DESIGN any organization's marketing strategy

Course Contents:

Unit 1: Marketing

Meaning, significance, Basic Concepts in Marketing - Need, Want, Demand, Customer, Consumer, Exchange, Markets, Marketing Segmentation, Marketing channels, Competition, Marketing Environment, Customer Value, Customer Satisfaction, Customer Delight. Market- its meaning and classification, Marketing Orientation towards Market Place. Production Concept, Product Concept, Selling Concept, Marketing Concept., Societal Marketing Relationship Marketing Concept, Holistic Marketing, Marketing Myopia.

Unit 2: Marketing Mix and Trends in Marketing

Concept of Marketing Mix, Traditional Marketing Mix – 4P's and 4C's, Extended Marketing Mix – 7P's, Trends in Marketing – Viral Marketing, Digital Marketing, Green Marketing, Guerilla Marketing, and Social Marketing, Marketing for the 21st Century, The New Marketing Realities, Major Societal Forces.

Unit 3: Marketing Planning Process and Marketing Environment

Marketing Planning Process, Purpose and Scope of Marketing Environment Analysis, Concepts of Macro and Micro environment, Components of Macro environment, Components of Micro environment.

Unit 4: Identifying Market Segments and Targets

Definitions – Segmentation, Market Targeting and Positioning, Market Segmentation: Need and Bases for Market Segmentation – Geographic, Demographic, Psychographic and Behavioral, Effective Segmentation Criteria Evaluating and Selecting the Market Segments, Market Targeting: Target Market Selection, Market Targeting Strategies, Positioning: Differentiation and Positioning, USP, POP, POD.

Unit 5: New Product Development

Concept and Need for new product development, Booz Allen and Hamilton Classification Scheme for New Products, The New Product Development Process- Idea Generation to commercialization, Principles of Success, Product Differentiation and Positioning strategies, New product development and introduction strategies, Planned or unplanned strategy withdrawals / obsolescence, Contingency / alternative strategic planning.

Reference Books:

1. Marketing Management - Philip Kotler, Kevin Lane Keller, Pearson, 15th Edition.
2. Marketing Management – Ramaswamy and Namakumari, Macmillan, 4th Edition.
3. Marketing Management – Rajan Saxena, TMGH, 4th Edition.

COURSE CODE	MB106
COURSE TITLE	BUSINESS LAW
COURSE CREDITS	3

Course Description:

The aim of this course is to instill keen understanding and appreciation of the legal aspects of business. This course will provide an understanding of legal methodology and the main principles of law relating to business transactions. The course will also demonstrate how commercial law and business practice inter relate and often influence each other in shaping modern communication and industry. In particular, key legal topics will be explained and illustrated from business perspective

Course Objectives:

1. To make the students familiar with the concept of law and various laws relating to business, understand and discuss core legal theories.
2. To introduce students to the laws and ethical standards that managers must abide by in the course of conducting business.
3. To get trained in supporting theoretical solutions with arguments in a systematic manner.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
106.1	Remember	STATE basic concepts related to the Business Law. STATE Various terminologies used in Contract Act
106.2	Understand	EXPLAIN the agreement, warranty, conditions, caveat emptor, unpaid seller, rights of unpaid seller
106.3	Apply	INTERPRET the provisions related to consumer protection council, redressal machinery, definitions.
106.4	Analyze	COMPARE various tools for IT protection, cyber regulations, appellate tribunals
106.5	Evaluate	APPRAISE legal process for company formation, documentation, MoA, AoA, Doctrine of Ultra - Vires
106.6	Create	DESIGN legal framework for business. CREATE model for legal compliances

Course Contents:

Unit 1: The Contract Act, 1872

Introduction, Sources of Indian Business Law, Salient features of Indian Contract Act, 1872, Meaning of contract, Essential elements of a valid contract, Types of contract, Difference between void and voidable contract, difference between illegal and void agreement, Offer and Acceptance, Capacities of Parties to contract, Free Consent, Coercion, difference between coercion and undue influence, misrepresentation, fraud, essential elements of fraud, difference between fraud and misrepresentation, mistake, void agreements, Discharge of contract, Special Contracts – Contingent and Quasi Contract, Contract of indemnity and guarantee.

Unit 2: Sales of Goods Act, 1930

Introduction, Contract of Sale, Sale and Agreement to sell, Essential elements of a Contract of Sale, Difference between sale and agreement to sell, classification of goods, Condition and

Warranty, Difference between Condition and Warranty, Situations when condition is treated as warranty, express and implied warranties, caveat emptor, Unpaid Seller, Rights of an Unpaid seller.

Unit 3: The Consumer Protection Act, 2019

Genesis of Consumer Protection Laws Definitions, Consumer Protection Council, Redressal Machinery Under The Act – District Consumer Forum, State Commission, National Commission.

Unit 4: The Information Technology Act, 2000

Information Technology Act – Definitions, Important terms under Information Technology Legislation, Digital Signatures, Electronic Records, Certifying Authority, Digital Signature Certificate, Cyber Regulation Appellate Tribunal.

Unit 5: Companies Act, 2013

Company – Definition, Nature and Forms of Business (including One Person Company and Limited Liability Partnership), Concept of Corporate Personality, Corporate Veil, Promoters – Meaning, Position, Duties, Rights, Responsibilities and Liabilities, Formation of Companies, Memorandum of Association & Articles of Association, Doctrine of Ultra-Vires, Indoor Management.

Prescribed Books:

1. Business Laws - S.S.Gulshan, Excel Books.
2. An Introduction to Mercantile Laws - N.D.Kapoor.

Suggested Readings:

In addition to above books, students are advised to refer to the monthly journals like Chartered Accountant, Chartered Secretary and All India Reporter for latest case laws.

GBSRC MBA Syllabus

COURSE CODE	MB107
COURSE TITLE	STATISTICS AND QUANTITATIVE TECHNIQUES
COURSE CREDITS	3

Course Description :

The basic knowledge of the Statistical and Quantitative Techniques is must for every management student and professional. The increased scale of business operations and growing competition has made the job of a management professional more challenging than ever before. SQT is an important knowledge that student should have for handling these competitive business situations.

Course Objectives:

1. To get Competency in use of Statistics and Statistical techniques in day to day business.
2. To build basic understanding of Probability and Probability distribution.
3. To equipping the students with essential tools for statistical analysis at Graduate level.
4. To build an understanding of Software and use of SPSS, Minitab and other software.
5. To forecast understanding through real world statistical applications.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
107.1	Remember	State various concepts, Methods, Procedures, Techniques used in the Statistics and Quantitative Techniques.
107.2	Understand	Describe the relevant Methods, Procedures and tools used in the Statistics and Quantitative Techniques to solve the business problem.
107.3	Apply	Solve the given business problem using appropriate Statistical and Quantitative Techniques.
107.4	Analyze	Examine the given business problem using appropriate Statistical and Quantitative Techniques.
107.5	Evaluate	Support the determined solution with proper justification in Statistics and Quantitative Techniques.
107.6	Create	Formulate a mathematical problem from a given word business problem in Statistics and Quantitative Techniques.

Course Contents:

Unit 1: Introduction to Statistics

Statistics in Business Management, Statistical Terms and Concepts – Data, variable, Population, Sample, Random sample. Arranging data to convey meaning – Tables, Graphs and frequency Distribution - Measures of central Tendency and dispersion - Simple and Multiple Regression and Correlation - Association of Attributes.

Unit 2: Probability

Probability Distribution, Binomial Distribution, Poisson distribution. Normal Distribution.

Unit 3: Linear Programming

Formulation and Graphical solution to two variables assignment problem, Transportation problem.

Unit 4: Management Theories

Queuing Theory- Single server and Multi Server, Games Theory- 2 X 2 zero sum game with

dominance – Pure Strategy and Mixed Strategy, Decision Theory- 5 criteria of Decision-making. Markov Chain with simulation techniques- Monte Carlo simulation.

Unit 5: Usage of MS-excel in statistics

Introduction to statistical packages - SPSS/SISSTAT/MATLAB.

Prescribed Books

1. Richard I. Levin and David S. Rubin, Statistics for Management, 7th edition, Prentice Hall of India Pvt. Ltd., NewDelhi.
2. David M. Levine, Timothy C. Krehbiel and Mark L. Berenson —Business Statistics: A First Course, Pearson Education Asia, 2nd edition, New Delhi, 2000.
3. Hooda, R.P., Statistics for Business and Economics, Macmillan India Ltd., 2nd edition.
4. David F. Groebner, Patrick W. Shannon, Phillip C. Fry and Kent D. Smith, —Business Statistics: A Decision making approach, 5th edition, Prentice Hall, 2001.
5. Chandan. J. S., Statistics for Business and Economics, Vikas Publishing House Pvt.Ltd.,

GBSRC MBA Syllabus

COURSE CODE	MB108
COURSE TITLE	BUSINESS COMMUNICATION
COURSE CREDITS	3

Course Description :

Global workplaces in the 21st century require employees who can communicate effectively in a range of challenging circumstances. This practical course offers you critical knowledge about the complexities of modern communication in organisations. You will have the opportunity to develop and practice their verbal, non verbal, written and digital communication techniques in a range of simulated workplace situations as well as through liaison with organisations. These skills will be particularly relevant for you as they transition to the world of work and advance in their careers.

Course Objectives:

1. To understand the concepts and acquire necessary communication skills that would help in shaping personalities.
2. To make students conversant with the basic forms, formats and techniques of business writing so that you will be thoroughly prepared to take part in real-world business fields.
3. To facilitate discussion of all relevant communicational theories so that students can apply this knowledge to a myriad of different communicational tasks and genres.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
108.1	Remember	STATE the basic concepts, models and theories of communication skills that would help in shaping personalities.
108.2	Understand	DESCRIBE the models and methods used in developing communication strategies.
108.3	Apply	MAKE USE OF organisational infrastructure to COMMUNICATE clearly and with impact by improving their verbal and non-verbal communication style.
108.4	Analyze	INTERPRET the organization's communication barriers in a cross cultural environment.
108.5	Evaluate	CRITIQUE the effectiveness of various techniques used in developing various communication strategies in the organisation.
108.6	Create	CONSTRUCT a model of communication which facilitate the free flow of communication within the organisation.

Course Contents:

Unit 1: Communication

Meaning and definition, Nature of Business Communication, Objectives and Importance of Business Communication, Limitations of Business Communication, Communication Process, Classification of Business Communication, Principles- 6 C's of Communication.

Unit 2: Forms of Communication and Listening Skill

Verbal and Non-Verbal Communication, Merits and Demerits of Oral, Written and Non Verbal

Communication, Listening: Meaning, Importance, Types of listening, Tips for effective listening, Barriers for listening.

Unit 3: Presentation Skills and Meeting Managements

Profile of Good Speaker, Features of good presentation, Points to remember while delivering your presentation – stages of effective presentation, The use of visual aids to support your presentation. Conducting Meetings : Procedure – Preparing agenda, Minutes and Resolutions.

Unit 4: Written Communication

Format of Business Letters, routine letters - enquiries, customers' complaints, collection letters – Sales promotion letters, bad news and persuading letters, job application letters Report Writing – Structure of Reports – Long and Short Reports – Formal and Informal Reports.

Interviews: Types of Interviews, Interview Techniques, Frequently asked Questions at Interviews, Mock Interviews.

Unit 5: Effective Communication

Importance and Barriers to Effective Communications, Communication Skills, Influencing Techniques.

Cross Cultural Communication: The Cross Cultural Dimensions of Business Communication, techniques of eliciting response, probing questions, Observation, Business Etiquettes.

Prescribed Books:

1. Rao P. Subba, Kumar B. Anita and Bindu C. Hima, Business Communication, Cengage Learning, 2012.

Prescribed Books:

1. Rajendra Paul and Korlahalli, Essential of Business Communication, Sultan Chand, 10th edition, 2004.
2. Lesikar, R.V. and Flatley, M.E. (2005), Basic Business Communication Skills for empowering the Internet Generation, Tata McGraw Hill Publishing Company Ltd., New Delhi.

DOMAIN ELECTIVES (Only 1)

COURSE CODE	MB109I
COURSE TITLE	INTRODUCTION TO AGRI BUSINESS MANAGEMENT
COURSE CREDITS	2

Course Description:

Course introduce the student regarding various types of Agro base industries, emerging trends in Agribusiness management & factor for production which will helps to increase GDP share & improve the Indian economy through various agro base business.

Course Objectives:

1. To understand farm business administration and business planning skills.
2. To give required skill to deal with the many factors facing agribusiness.
3. To understand modern practices used in agribusiness today.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
109I.1	Remember	STATE modern practices used in current business scenario of Agribusiness Management.
109I.2	Understand	EXPLAIN the fundamental principles, theories and concepts of Agribusiness Management.
109I.3	Apply	USE domain knowledge to develop Agribusiness projects at operational level.
109I.4	Analyze	EXAMINE various emerging trends in Agribusiness Management.
109I.5	Evaluate	SELECT best practices in Agribusiness Management.
109I.6	Create	DESIGN the model of Farmer Producer Organization (FPO) or Farmer Producer Company (FPC).

Course Contents:

Unit 1: Agribusiness

Agribusiness meaning, definition, structure and importance of agribusiness, Agricultural Economics –Definition, its share in GDP, consumption and wants, Importance and scope of agriculture in Indian Economy, Types of Agro Industries and its classification, Distinctive features of Agribusiness management: Distinctive features of Agri business management Vs General industry.

Unit 2: Agro based industries

Importance and Role of Agro industries in economic Development of India, Types of agro-based industries and Agri Export Zones, Need of institutional arrangement for the promotion of agro-based industries, Procedure to be followed to set up agro-based industries, Constraints in establishing agro-based industries, Micro, small and medium enterprises (MSMEs).

Unit 3: Emerging Trends in Agribusiness Management

Agro Tourism, Organic Farming, Contract Farming, Herbal Farming, Post Harvest management and value addition, NGOs in agriculture and rural development, Biotechnology research and commercialization, Rural and Agri -foods retailing, Agriculture supply chain management, PPP (Public Private Partnership), Precision Farming.

Unit 4: Factors of Production

Production Characteristics of Agriculture and Industry, Production relationship and cost concepts, GAP (Good Agricultural Practices).

Unit 5: Forms of Farm Business Organization & Information Technology in Agribusiness

Sole proprietorship, Partnership and Corporation, Meaning, Role and importance in Agribusiness and Agriculture, Information Technology for Agricultural Marketing, Online Market information and online market status (e-trading), Websites on Agriculture marketing and export, Role of private companies in online marketing (E Choupal and HUL Shakti).

Prescribed Books :

1. "Agri Business Management Problems and Prospects" By Prof. R K Dixit and Dr Himanshu, Ritu Publications, Jaipur.
2. "Agri Business Management", Dr K P Sinha, A K Publications.
3. "Introduction to Agricultural Economics and Agri Business Management", by J M Talathi, V G Naik & V N Jalgaonkar, Ane Books India.
4. "Agri Business Management", Dr. J S Amarnath and Dr. A P V Samvel, Salish Serial Publishing House.
5. "Indian Agriculture and Agri Business Management", Dr, Smita Diwase, Krishi Resource Management Network.
6. "Agri Business Management", Smita Diwase, Everest Publishing House.
7. "Innovation in Agri Business Management", Karnam Lokanadhan, K Mani and K Mahendran, New Indian Publishing Agency.
8. "Cooperative Agri Business Management", A N Sarkar, Everest Publishing House.
9. "Agri Business and Extension Management", B S Hansra and K Vijayaragavan, Concept Publishing Company, New Delhi.

COURSE CODE	MB109II
COURSE TITLE	INTRODUCTION TO FINANCE
COURSE CREDITS	2

Course Description :

Introduction to Finance deals with the framework of finance. It discusses the scope of finance function and its emerging role in modern business

Course Objectives :

1. To study the basic concepts in finance as it is the lifeblood of any organization.
2. To know the basics of capital and money market.
3. To analyse the annual report of the company by using different techniques like common size analysis, trend analysis, ratio analysis etc.
4. To know all the contents of financial statements prepared as per Company's Act- Schedule I requirements.
5. To know the estimation and control of working capital.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
109II.1	Remember	STATE the important aspects like Nature, Scope, Objectives, Functions and Significance of financial Management.
109II.2	Understand	DESCRIBE the concept of time value of money and differentiate between the usage of compounding and discounting techniques.
109II.3	Apply	SKETCH the usage of various long term sources of finance in various situations.
109II.4	Analyze	COMPARE and CONTRAST between various financial instruments like bonds and shares.
109II.5	Evaluate	APPRAISE the various methods of long term finance for raising capital.
109II.6	Create	CONSTRUCT a plan for cash and receivables management.

Course Contents:

Unit 1: Introduction

Meaning of Financial Management, Nature & Scope of Finance Function, Objectives of Finance Functions, Significance of Finance Functions, Role of modern Finance Manager.

Unit 2: Time Value of Money

Concept of Time Value of Money, Application of Time Value of Money – Compounding and Discounting.

Valuation of Bonds and Shares:

Introduction, Concepts of Value, Features of Bond, Bond Values and Yields, Yield to Maturity, Present Value of a Bond, Valuation of ordinary shares.

Unit 3: Sources of Long Term Finance

Equity, Preference Shares, Debentures, Bonds, Term Loan, Hire Purchase, Leasing, Venture Capital, Crowd Funding, External Commercial Borrowings, ADRs, GDRs, Euro Bonds, FCCBs.

Unit 4: Raising of Long Term Finance

IPO, Red Herring Prospectus, Book Building Process, Green Shoe Option, Listing of Securities in Stock Exchange, Rights Issue, Bonus Issue, Private Placement of shares.

Unit 5: Management of Cash and Receivables Management

Motives for holding cash, Objectives of Cash Management, Factors determining cash needs, Cash management techniques, Introduction to receivables management, Objectives, Credit Policies, Credit Terms, Collection Policies.

Prescribed Books:

1. IM Pandey, Financial Management, Vikas Publishing, Ninth Edition.
2. Prasanna Chandra, Financial Management, Tata McGraw-Hill, Sixth Edition.
3. James C Vanhorne, Financial Management and Policy – Pearson Education Asia, 12th edition.
4. M.Y. Khan and P.K. Jain, Financial Management, Tata McGraw-Hill, Fourth Edition.
5. A. P.Rao, Financial Management, Everest Publishing, Pune.

GBSRC MBA Syllabus

COURSE CODE	MB109III
COURSE TITLE	PERSONNEL ADMINISTRATION AND DOCUMENTATION
COURSE CREDITS	2

Course Description: People are vital input for the effective functioning of an organization. For any organization to become successful it is necessary to recognize the potential personnel, acquire them, develop and to retain the same. The term Personnel refers to Body of employees who fill the various positions in an organization. Personnel administration is the collective concern towards the human resources of an organization.

Course Objectives:

1. To give students insight into the implementation of Personnel Administration Procedures.
2. To acquaint students with General consideration in wage and Salary.
3. To acquaint students with General Communication and Disciplinary Action Communication.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
109III.1	Remember	STATE various concepts, nature, objectives and principles of Personnel Administration.
109III.2	Understand	EXPLAIN the systematic process of learning theories and styles.
109III.3	Apply	DEMONSTRATE general communication based on various personnel policies.
109III.4	Analyze	RELATE the time-keeping with wage and salary administration.
109III.5	Evaluate	DEFEND the challenges faced by personnel managers in modern businesses.
109III.6	Create	FORMULATE the policies for personnel administration and documentation.

Course Contents:

Unit 1: Personnel Administration

Definition, Nature, Objectives, Principles.

Unit 2: Personnel Policy

Definition, Scope, Process, Objectives, Contents of Personnel file and Personnel audit, Personnel Department Structure, proper Environment around factory.

Unit 3: General Communication

Drafting of appointment orders, Interview letters, Promotion, Transfer and Appreciation Letters, Notices and Circulars (All Types).

Unit 4: Wage and Salary Administration

General consideration in wage and Salary administration – Objectives and principles, Time keeping, Attendance.

Unit 5: Disciplinary Action Communication

Suspension Orders, show cause, Notices, memo, charge sheet, warning, letter of termination and dismissal, Challenges of modern personnel manager.

Prescribed Books:

1. Guide of Labour Management forms and precedents (Law, Practice and Procedure)by S.D. Puri (Snow white publications).
2. Personnel Management by EdwinFlippo.
3. Personnel Management by C.B.Mamoria.
4. Dynamics of personnel Administration by Rudrabaswaraj.

GBSRC MBA Syllabus

COURSE CODE	MB109IV
COURSE TITLE	INTRODUCTION TO PHARMACEUTICAL BUSINESS ENVIRONMENT
COURSE CREDITS	2

Course Description:

This course enables students to learn about the channel of pharmaceutical marketing, Pharmaceutical Business Environment and its effect of promotional strategies, and physician's prescriptions

Course Objectives :

1. To enable students to learn about the channel of pharmaceutical marketing and develop an attitude towards of concern for the environment.
2. To enable students to learn Pharmaceutical Business Environments effect of promotional strategies, and physician's prescriptions.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
109IV.1	Remember	STATE Pharmaceutical Market and Pharmaceutical Environment.
109IV.2	Understand	EXPLAIN Macro and Micro analysis of Pharmaceutical Business Environment.
109IV.3	Apply	IMPLEMENT Marketing Strategies for generic and non-prescription drugs.
109IV.4	Analyze	EXAMINE the various distribution channels in Pharmaceutical Business Environment.
109IV.5	Evaluate	APPRAISE promotional mix at domestic and international level.
109IV.6	Create	DEVELOP PESTEL analysis for a pharma product.

Course Contents:

Unit 1: Introduction to Pharmaceutical Management

Identification of pharmaceutical market; market behaviour; physician prescribing habits; patient motivation; market analysis.

Unit 2: Environmental Scanning of Pharmaceutical Business Environment

Micro and Macro Analysis, PESTLE Analysis of Pharmaceutical Business Environment.

Unit 3: The Pharmaceutical Products

Drug Development and the Marketing Research Interface; Diversification and Specialisation; Marketing Generic Drugs; Non-prescription drugs.

Unit 4: Distribution Channels

Manufacturer; Wholesaler; Retailer; Hospital and Government Agencies.

Unit 5: Competitive Practices

Economic and Competitive Aspects of the Pharmaceutical Industry; Advertising; Detailing and other forms of Promotion; Retail Competition – The Community Level; International Marketing, Internal and External Controls.

Prescribed Books

1. Sachin Itkar, Pharmaceutical Management, Nirali Prakashan, 2nd Edition.
2. Subba Rao, Pharmaceutical Marketing in India.
3. Pharmaceutical Selling – MukaBodya.
4. Tora Tora, Principles of Anatomy and Pharmacology, John Wiley and son, 11th Edition.
5. Satoskar, Pharmacology (Pharmaceutical), Popular Prakashan, 9th Edition.

GBSRC MBA Syllabus

COURSE CODE	MB109V
COURSE TITLE	INTRODUCTION TO LIFE SCIENCES, BIOTECHNOLOGY AND BIOINFORMATICS
COURSE CREDITS	2

Course Description:

This course is designed to learn the basic concepts in Biotechnology and Bioinformatics. The objective of the course is to familiarize the students with the tools and techniques in Biotechnology and Bioinformatics. They would also understand the importance of analytical tools in biotechnology and its applications in various industries. At the end of the course, the students will have sufficient scientific understanding of the basic concepts in instrumentation used in Biotechnology.

Course Objectives:

1. To introduce students with cell biology and basic concepts of Life sciences.
2. To familiarize the students with basic concept in Microbiology and various diseases associated with microorganisms.
3. To familiarize the students with the basic concepts in Biochemistry and classification of carbohydrates, Lipids and Proteins.
4. To introduce students with the history of Biotechnology.
5. To study basic concepts in Bioinformatics.
6. To familiarize the students with the tools and techniques in Biotechnology and Bioinformatics.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
109V.1	Understanding	The student will be able to develop an UNDERSTANDING of the basic concepts in Life Sciences.
109V.2	Understanding	The student will be able to UNDERSTAND the fundamentals of Cell biology, Microbiology and Biochemistry.
109V.3	Remembering	The student will be able to EXPLAIN, distinguish and analysis the information regarding Types of Micro-organisms, diseases associated with them and various symptoms.
109V.4	Remembering	The student will be able to IDENTIFY opportunities available for small or big enterprise in Biotechnology and Bioinformatics.
109V.5	Understanding	The student will be able to exhibit UNDERSTANDING about the ethical issues involved in Biotechnology and Bioinformatics.
109V.6	Creating	The student will be able to exhibit DESIGN Biodiversity conservation methods.

Course Contents:

Unit 1: Introduction to Life Sciences: Cell Biology, Biochemical composition and the ultrastructure of the cell. Cell -Cell interaction, structure and function of cell organelles.

Unit 2: Introduction to Microbiology: Morphology and fine structure of bacteria. Control of Microorganisms, Viruses, Microbial organisms and diseases.

Unit 3: Introduction to Biochemistry: Structure, Classification and Properties of Carbohydrates, Lipids, Proteins and Nucleic acids.

Unit 4: Introduction to biotechnology, history of biotechnology, facts of modern biotechnology, scope and importance of Biotechnology, Tools and techniques in Biotechnology: Analytical techniques and Molecular Techniques.

Unit 5: Biotechnology and Biodiversity, Applications of Biotechnology in India, Business opportunities in biotechnology, Future of biotechnology in India, Introduction to Bioinformatics - What is bioinformatics, databank, data capture, data analysis, databases, Databases - Different biological databases and their applications, Applications of Bioinformatics - Bioinformatics industry in India.

Prescribed Books:

1. B. D. Singh, Biotechnology, Kalyni Publishers, 1st Edition.
2. Kumar H. D., Textbook of Biotechnology, East-West Press.
3. Attwood T. K., D. J. Parry-Smith, Introduction to bioinformatics, Pearson Education.
4. Rastogi, Bioinformatics: Methods and Applications, Prentice Hall India, 2nd Edition.
5. David Mount, Bioinformatics: Sequence and Genome analysis.
6. Stephen and David, Introduction to Bioinformatics: A theoretical and practical approach.

GBSRC MBA Syllabus

COURSE CODE	MB109VI
COURSE TITLE	INTRODUCTION TO IT
COURSE CREDITS	2

Course Description:

This course is designed to be an introductory course in information technology. The course focuses on key concepts for understanding modern computer systems. Students will also learn about the capabilities and limitations of information technology systems.

Course Objectives:

1. To understand the fundamentals of information technology.
2. To learn core concepts of computing and modern systems.
3. To understand modern software programs and packages.
4. To learn about upcoming IT technologies.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
109VI.1	Remember	DEFINE the concepts, various tools, softwares used.
109VI.2	Understand	DESCRIBE the various uses of computer networking and internet.
109VI.3	Apply	DEMONSTRATE the expertise in Information Technology tools such as MS Excel, MS Word and MS Powerpoint etc.
109VI.4	Analyze	DIFFERENTIATE between various IT technologies used in Business.
109VI.5	Evaluate	SELECT the appropriate frameworks and models for successful e-commerce.
109VI.6	Create	DESIGN and develop social media marketing campaign.

Course Contents:

Unit 1: Introduction to Information Technology

Introduction to Software and Hardware, Types of Software, Need for Information Storage and Processing, Information Technology Components, Role of Information Technology, Information Technology and the Internet.

Unit 2: Internet, its Tools and Emerging Trends in IT

Introduction, Internet Evolution, Basic Internet Terminology, Internet Applications, Computer Ethics, Introduction, Electronic Commerce (E-Commerce), Electronic Data Interchange (EDI), Smart Cards, Mobile Communication.

Unit 3 : Introduction To Internet (WWW AND WEB BROWSERS)

Introduction, Basic of Computer Networks, Local Area Network (LAN), Wide Area Network (WAN), World Wide Web (WWW), Web Browsing Softwares, Popular Web Browsing Softwares, Search Engines, Understanding URL, Surfing the web (Using e-governance website).

Unit 4 : MS Word, Excel and Powerpoint

Introduction, Windows 2007 Interface, Customizing the Word Application, Document Views, Basic Formatting in MS Word 2007, Advanced Formatting, Navigating through a Word Document, Performing a Mail Merge, A Quick Look at Macros, Printing Documents, Print

Preview, Introduction, Workbook, Worksheet, Formatting in excel, Advanced formatting in Excel, Working with formulas, Printing worksheets, Introduction, Creating a Presentation, Basic Formatting in PowerPoint, Advanced Formatting, Using Templates, Inserting charts, Inserting tables, Printing presentations.

Unit 5: Programming and ERP Systems

Software Design Cycle-Programming Languages- Enterprise Resource Planning (ERP) Systems- Social Media-Major Types of Websites-Wikis-SocialNetworking-Marketing.

Prescribed Books:

1. Management Information System: Jawadekar.
2. Management Information System: Laudon and Laudon.
3. The Essential Guide to Knowledge management: Amrit Tiwana.
4. The GIS Book: George B. Karte.
5. Internet (Use of Search Engines Google and yahooetc).
6. E – Commerce: Milind Oka.
7. E – Commerce: C.V.S. Murty.
8. Fire Wall and Internet Security: William Cheswick, Stevens, Aviel Rubin.
9. E-Governance Case Studies – Ashok Agarwal.

GBSRC MBA Syllabus

COURSE CODE	MB109VII
COURSE TITLE	INTRODUCTION TO INTERNATIONAL BUSINESS
COURSE CREDITS	2

Course Description:

The most conspicuous aspect of international boundaries is crossing the national boundaries. Firms seek international market opportunities more today than ever before, touching the lives of billions of people around the world. Knowledge about international business, therefore, assumes great relevance for the upcoming Global managers

Course Objectives:

1. To Understand the scope and challenges for a company to enter into the international market along with the theories of International Trade.
2. To gain the knowledge of Country risk analysis process before making a decision to enter into international market and market entry strategies.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
109VII.1	Remember	STATE basic concepts related to the elements of International Business
109VII.2	Understand	EXPLAIN the role of WTO, ILO and other Global Trade Institutions
109VII.3	Apply	INTERPRET the components of International Business Environment
109VII.4	Analyze	COMPARE various types of Foreign Investments
109VII.5	Evaluate	APPRAISE various types of Regional Trade Agreements and Regional Integration

Course Contents:

Unit 1: Introduction to International Business

Introduction, Introduction to International Business, Elements of International Business, Globalization.

Unit 2: International Business Environment

Introduction, Economic Environment, Political Environment, Demographic environment, Legal Environment, Global Sourcing and Indian Industries structure, Introduction, What is global sourcing, Reasons for global sourcing, advantages and disadvantages, Challenges for Indian Businesses.

Unit 3: Culture and International Business

Introduction, Meaning of Culture, Country Culture, and Culture in an International Business Organization. Foreign Investments- Types and Motives: Foreign investments, types of foreign investments, motives.

Unit 4: Regional integration

Introduction, Overview of Regional Integration, Types of Integration, Regional Trading Arrangements, India and Trade Agreements.

Unit 5: Global trade institutions

Introduction, World trade organization (WTO), International Labour Organization (ILO), International Financial Management: Introduction, Overview of International Financial Management, Components of International Financial Management, Scope of International Financial Management.

Prescribed Books:

International Business –By K Ashwathappa, TATA McGraw-Hill publication, Third edition.

Suggested Readings:

1. International Business-Competing in the Global Marketplace by Charles W Hill and Arun K Jain, TATA McGraw-Hill publication, Sixth edition.
2. International Business –Strategy, Management And The New Realities By S.TamerCavusgil, Gary Knight and John R. Reisenberger, Pearson Publications, First Edition.

GBSRC MBA Syllabus

COURSE CODE	MB109VIII
COURSE TITLE	HEALTHCARE AND HOSPITAL MANAGEMENT
COURSE CREDITS	2

Course Description:

The Masters in Hospital Administration is aimed towards orienting and developing students for executive positions in hospitals. The course develops the managerial skills of individuals and also exposes them to clinical aspects of hospital management. The students have the option of developing their skill set in a particular area of hospital management while taking the optional modules.

Course Objectives:

1. To analyze and assess various situations in the hospital.
2. To plan and organize developmental policies and implement strategies.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
109VIII.1	Remember	STATE various concepts, theories and practices of Healthcare Management.
109VIII.2	Understand	EXPLAIN National Health Program prescribed by the Government.
109VIII.3	Apply	IMPLEMENT the Healthcare to population through government agencies.
109VIII.4	Analyze	COMPARE the International Health Organization Policy and National Health Policy towards Healthcare Management.
109VIII.5	Evaluate	To SUPPORT the planning and organization of Hospitals in terms of Management in OPD/ICU/Operation Theatre/ Materials and Logistics and Allied Hospital Services.
109VIII.6	Create	FORMULATE the effective Healthcare Management/ Hospital Management System.

Course Contents :

Unit 1 : Introduction

Introduction to Health care management with three tier Health care delivery.

Role of hospitals and other healthcare organizations.

Unit 2 : Medical terminology

Medical terminology-roots, prefixes and suffixes, Nomenclatures of specialties and sub-specialties

Unit 3 : Basics of Epidemiology

Concept of health and disease, Natural history of disease, Health indicators and measurement of health

Unit 4 : National Health

National health : Ministry of Health & Family Welfare (MOHFW), Healthcare delivery at central, state, regional and village level. National Health Policy. National and disease reporting and registries.

Unit 5: International Health

International Health : Role of UN, WHO, CDC, USAID and other international bodies.

Historical aspects : Health for All (HFA) by 2000, Millennium Development Goals (MDGs), Sustainable Development Goals (SDGs), Global health perspectives_ Models of Cuba, GCC, European countries, USA and comparative perspectives. International disease reporting and registries.

Prescribed Books

1. S.L. Goal, Hospital Administration and Management, Prentice Hall India.
2. Darr Kurt, Hospital Organization and Management.
3. Frinch C.B., Host Planning and Management.
4. Goal S.L, Management of Hospital.
5. Gupta P.D., Useful reading for Hospital Management.
6. Prof Satoskar, Hospital Mgt, Pragti Books.

GBSRC MBA Syllabus

COURSE CODE	MB109IX
COURSE TITLE	INTRODUCTION TO OPERATIONS AND SUPPLY CHAIN MANAGEMENT
COURSE CREDITS	2

Course Description:

This course introduces the viewer to the basics of Operations and Supply Chain Management. The concepts in Operations Management are restricted to the planning and operational decisions within an organization while the supply chain concepts are for a network of organizations. The main emphasis of the course is on the basic concepts and on quantitative modeling of the various decision problems.

Course Objectives:

1. To Specify and implement a framework for Understanding concept of Operations in an organization.
2. To develop alternative solutions and a set of evaluation criteria.
3. To assess the outcomes of a course of action and make appropriate adjustments.
4. To understand concept of supply chain management.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
109IX.1	Remember	DEFINE nature, scope, importance, and functions of Operations Management.
109IX.2	Understand	DESCRIBE the forecasting process and its types.
109IX.3	Apply	DEMONSTRATE the scheduling strategies along with its factors, guidelines, approaches and methodologies..
109IX.4	Analyze	EXAMINE various aspects of supply chain management.
109IX.5	Evaluate	SELECT proper scheduling approach for products and services.
109IX.6	Create	DESIGN appropriate Just in Time process for waste reduction, inventory and supply chains.

Course Contents:

Unit 1: Introduction to Operations Management

Nature, Scope, Importance and Functions - Evolution from manufacturing to operations management - Evolution of the factory system - manufacturing systems –quality – mass customization. Contribution of Henry Ford, Deming, Crosby, Taguchi.

Unit 2: Forecasting

Introduction, The Strategic Importance of Forecasting, Benefits, Cost implications and Decision making using forecasting, Classification of Forecasting Process, Methods of Forecasting, Forecasting and Product Life Cycle, Selection of the Forecasting Method, Qualitative Methods of Forecasting, Quantitative Methods, Associative Models of Forecasting, Accuracy of Forecasting.

Unit 3: Operations Scheduling

Introduction, Purpose of Operations Scheduling, Factors Considered while Scheduling,

Scheduling Activity under PPC, Scheduling Strategies, Scheduling Guidelines, Approaches to Scheduling, Scheduling Methodology [Quantitative], Scheduling in Services.

Unit 4: Supply Chain Management

Introduction, Domain Applications, SCM– The Breakthrough Article, Supply Chain Management, Views on Supply Chain, Bullwhip Effect in SCM, Collaborative Supply Chain, Inventory Management in Supply Chain, Financial Supply Chain – A New Revolution within the SCM Fold.

Unit 5: Just-In-Time

Introduction, Characteristics of JIT, Key Processes to Eliminate Waste, Implementation of JIT, Pre-requisites for implementation, JIT Inventory and Supply Chains.

Prescribed Books

1. Operations Management by Evans and Collier.
2. Operations Management by Heizer and Render.
3. Supply Chain Management by Janat Shah.

GBSRC MBA Syllabus

COURSE CODE	MB109X
COURSE TITLE	INTRODUCTION TO BUSINESS ANALYTICS
COURSE CREDITS	2

Course Description:

The goal of this course is to provide students with the mathematical and practical background required in the field of data analytics.

Course Objectives:

1. To identify groups of Observations enables one to improve business efficiency.
2. To learn why using rigorous statistical methods to understand the relationship between different events is crucial.
3. To learn more about the importance of forecasting the future.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
109IX.1	Remember	DEFINE terminologies, needs, key functions, procedure of Data analytics.
109IX.2	Understand	DESCRIBE various types of analytics, questions and variables
109IX.3	Apply	MAKE USE OF the appropriate analytics type, sources of information ,Michael Porter's 5 Force model in business analytics of Project Management.
109IX.4	Analyze	EXAMINE various Information Systems and their importance in decision making.
109IX.5	Evaluate	SELECT appropriate Business Analytics Technique to solve the given business situation.
109IX.6	Create	VISUALIZE the data to get meaningful insights from it.

Course Contents:

Unit 1: Basics of Business Analytics

Key Terminologies, growth of Business Analytics, reasons for increasing Industry focus on Analytics, value delivered, key functions, building a Business Analytics team, 7 steps to Data Modelling.

Unit 2: Types of Analytics

Descriptive, Diagnostic, Predictive, Prescriptive, Autonomous. Types of Variables, Statistical summarisation, 6 Types of Questions.

Unit 3: Business Analytics Project Management

DIKW model, Characteristics of Information, Sources of Information, handling missing data, enabling collation and collaboration, Information as Competitive Advantage, Michael Porter's 5 Force model.

Unit 4: Types of Information Systems

Transaction Processing Systems, Management Information Systems, Decision Support Systems, Executive Information Systems, Data Warehousing, Data Mining, Data Visualisation.

Unit 5: Future of Business Analytics

Artificial Intelligence, Machine Learning, Deep Learning, Internet of Things (IoT), The Digital Firm, characteristics of eBusiness, Mobility and Cloud.

Prescribed books:

1. Kerns, G. J. (2010). Introduction to probability and statistics using R. Publisher: G. Jay Kerns.
2. Verzani, J. (2014). Using R for introductory statistics - 2nd Edition. New York: Chapman and Hall.

GBSRC MBA Syllabus

COURSE CODE	MB110
COURSE TITLE	DISASTER MANAGEMENT
COURSE CREDITS	1

Course Description:

This course is being introduced to enable students and citizens to recognize the increasing vulnerability of the planet in general and India in particular to disasters. This, it is expected would create basis to work towards preparedness and also help develop a culture of safety and prevention. The course elaborates on both natural and man made disaster and how to mitigate in the wake of accidents. Under each category, the causes and impact along with illustration would be discussed in detail.

Course Objectives:

1. To increase the knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences.
2. To increase the knowledge and understanding of the national Strategy for Disaster.
3. To ensure skills and abilities to analyse potential effects of disasters and of the strategies and methods to deliver public health response to avert these effects.
4. To ensure skills and ability to design, implement and evaluate research on disasters.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
110.1	Remember	DEFINE the various natural disasters and different aspects influencing vulnerabilities and capacities to face disasters.
110.2	Understand	DESCRIBE the various types of man made disasters and their causes and effects.
110.3	Apply	DEMONSTRATE emergencies and disaster events insight into the potential and limitations of science, its role in society and people's responsibility for how it is used.
110.4	Analyze	ANALYZE, and communicate information on risks, relief needs and lessons learned from earlier disasters.
110.5	Evaluate	SELECT various risk Analysis Techniques for risk reduction. And formulation of strategies for mitigation in future.
110.6	Create	DESIGN and develop disaster Preparedness, and Mitigation plan by various authorities

Course Contents:

Unit 1: Understanding Natural Disasters

Understanding Natural Disasters, Understanding Disaster Management, Flood, Drought, Cyclone, Earthquakes, Landslides, Avalanches, Volcanic Eruptions, Heat and Cold Waves, Climate Change: Global Warming, Sea Level Rise, Ozone Depletion.

Unit 2: Understanding Man-Made Disasters

Understanding Man-Made Disasters, Nuclear Disasters, Chemical Disasters, Biological Disasters, Building Fire, Coal Fire, Forest Fire, Oil Fire, Air Pollution, Water Pollution, Deforestation, Industrial Pollution, Road Accidents, Rail Accidents, Air Accidents, Sea Accidents.

Unit 3: Risk Assessment and Vulnerability Analysis

Hazard, Risk and Vulnerability, Understanding Risk: Concept and Elements, Risk Reduction, Risk Analysis Techniques, Participatory Risk Assessment.

Unit 4 : Vulnerability Analysis

Vulnerability Analysis and Risk Assessment, Observation and Perception of Vulnerability, Strategies for Survival, Strategic Developments for Vulnerability Reduction.

Unit 5: Disaster Preparedness

Disaster Management: Prevention, Preparedness, and Mitigation, Disaster Preparedness: Concept and Nature, Disaster Preparedness Plan, Disaster Preparedness by various authorities, Information Technology.

Prescribed Books:

1. Bryant Edwards (2005): Natural Hazards, Cambridge University Press, U.K.
2. Carter, W. Nick, 1991: Disaster Management, Asian Development Bank, Manila.
3. Sahni, Pardeep et.al. (Eds.) 2012, Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi.

GBSRC MBA Syllabus



**GLOBAL BUSINESS SCHOOL AND RESEARCH CENTRE
DR. D. Y. PATIL VIDYAPEETH, PUNE**

(Accredited (3rd Cycle) by NAAC with a CGPA of 3.64 on four point scale at 'A++' grade)
(An ISO 9001:2015 & 14001 :2015 Certified University)

Name of the Programme : MBA

Name of Semester : SEMESTER II

COURSE CODE	MB201
COURSE TITLE	MARKETING MANAGEMENT
COURSE CREDITS	3

Course Description:

Marketing is a value-enhancing function that identifies opportunities, develops markets, and builds brands. Consequently, good marketing enables companies to charge price premiums, sustain competitive advantage and maintain long-run profitability. To this end, the course covers the following topics: understanding consumer and corporate behavior, conducting customer and competitor analysis, developing new products, branding and brand extension, pricing, designing distribution channels, and managing marketing-mix activities. First, you will be exposed to the fundamental concepts of marketing and thus learn the –language of marketing (i.e., talk-the talk).

Course Objectives:

1. To understand consumer and corporate behavior, conducting customer and competitor analysis, developing new products, branding and brand extension, pricing, designing distribution channels, and managing marketing-mix activities.
2. To understand marketing concepts and their application to profit oriented and non-profit oriented organizations.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
201.1	Remember	STATE basic concepts of Marketing and the 4 Ps.
201.2	Understand	EXPLAIN the Product mix, Product Line and Product Life Cycle
201.3	Apply	DEMONSTRATE the use of various Pricing Methods and Pricing Strategies
201.4	Analyze	COMPARE various components of Integrated Marketing Communications
201.5	Evaluate	APPRAISE the buying decision process with respect to various Products
201.6	Create	DEVELOP Marketing Strategies for a firm to be successful in the market and DEVELOP solutions to Marketing related problems of a firm

Course Contents:

Unit 1: Product

Concepts and Components, Products Meaning, Characteristics, Classification of Marketing Mix, Meaning, Goods and Services, Product Mix, Product Line and Product line appraisal, Levels of Product, Product Life Cycle - Managing the product in Product Life Cycle.

Unit 2: Pricing

A Changing Pricing Environment, Consumer Psychology and Pricing, Setting the Price, Factors influencing pricing decision - Approaches to pricing – Price and Non-price competition, Pricing methods, Pricing strategies.

Unit 3: Place

Importance, functions of distribution channels, Introduction to the various channels of distribution, Levels of Channel of Distribution, designing marketing channels, Introduction to Wholesaling, Retailing, Franchising, Direct Marketing, and Impact of technology and Internet on distribution.

Unit 4: Promotion

Elements of IMC and Developing respective communication campaign, Advertising, Sales Promotion, Publicity, Personal Selling, Direct marketing and direct response methods, Event Management, E-Commerce, Corporate Communication, Public Relations – Types of PR.

Unit 5: Consumer Behaviour

Concepts and Significance, Factors influencing Consumer buying Behaviour, The Buying Decision Process: Problem Recognition, Information search, Evaluation of Alternatives, Purchase Decision Post purchase Behavior, Buying Roles, Industrial buying process, Consumer markets Vs Industrial Market.

Suggested Readings:

1. Marketing Management A South Asian Perspective, Kotler, Keller, Koshy and Jha, Prentice Hall/Pearson
2. Marketing Management, Rajan Saxena, TMH
3. Marketing Management, Arun Kumar, N Meenakshi, Vikas Publishing
4. Fundamentals of Marketing, Bruce Walker and Stanton, McGrawHill
5. W.D. Perraut and E.J. Mc Carthy, Basic Marketing, TMH
6. Russel S. Winner, Marketing Management, Pearson
7. Marketing Management, Ramaswami and Namakumari,
8. Integrated Marketing Communications - Kenneth Clow and Donald Ba

COURSE CODE	MB202
COURSE TITLE	FINANCIAL MANAGEMENT
COURSE CREDITS	3

Course Description:

Financial management explores the core finance principles and theories and relates them to the practical world with the help of several pedagogical tools that help manage an organization's money. It practices create organizational value by allocating scarce resources among various business opportunities. It helps in the execution and supervision of organizational business policies. The importance of sound financial management practices cannot be stressed more in an ever-changing global economy.

Course Objectives:

1. To obtain an understanding and ability to use basic business financial management concepts.
2. To learn to apply tools of analysis such as valuation, risk-return relationships, financial statement analysis, capital budgeting, cost of capital, capital structure and working capital management.
3. To become familiar with the various types of financing available to a firm.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
202.1	Remember	DEFINE various terms, concepts, procedures, relationships of financial management.
202.2	Understand	EXPLAIN various concepts, tools and techniques of financial management.
202.3	Apply	USE different tools like ratio analysis, trend analysis and capital budgeting of financial management.
202.4	Analyze	EXAMINE financial health with respect to financial statement analysis, ratio analysis and working capital management.
202.5	Evaluate	SELECT alternative sources of finance and investment opportunities and their suitability in particular circumstances
202.6	Create	INVESTIGATE company's financial performance and make appropriate recommendations.

Course Contents :

Unit 1: Introduction to Financial Management

Overview of Financial Management, Financial Decisions, Profit Maximisation Vs Wealth Maximisation, Finance Functions, Relationship of Finance with other Disciplines, Role of Modern Finance Manager.

Unit 2: Financial Statement Analysis

Tools and techniques of financial statement analysis, Trend Analysis, Ratio Analysis – Meaning of Ratios, Objectives of ratio analysis, Types of Accounting Ratios (Including Problems).

Unit 3: Time Value of Money

Concept of Time Value of Money, Application of Time Value of Money – Compounding and Discounting, Types of compounding, Effective Annual rate, Future Value of Multiple Cash Flows, Future Value of Equal Cash Flows – Annuities and Perpetuities, Present Value of Single Cash Flow, Present Value of Multi period Cash Flow, Present Value of Annuity, Present Value of Annuity due, Present Value of perpetuity.

Capital Budgeting Decisions:

Nature and type of investment decisions, Techniques used in Capital Budgeting – Pay back period, Accounting Rate of Return, Net Present Value, Profitability Index, Internal Rate of Return.

Unit 4: Cost of Capital and Capital Structure

Introduction to Cost of Capital, Significance of cost of capital, Concept of opportunity cost of capital, Cost of Debt, Cost of Equity, Cost of Preference Capital, WACC, Capital Structure and Firm Value, EBIT-EPS Analysis.

Unit 5: Working Capital Management

Introduction, Meaning, Scope, Factors influencing Working Capital Requirements, Operating Cycle and Cash Cycle, Estimation of Working Capital Requirements.

Prescribed Books:

PrasannaChandra, –Financial Management, Tata McGraw-Hill.

Suggested Readings:

1. I M Pandey, Financial Management, Vikas Publishing, Ninth Edition.
2. MY Khan and PK Jain, Financial Management, Tata McGraw-Hill, Fourth Edition.
3. A.P Rao, Financial Management, Everest Publishing, Pune.
4. Sheeba Kapil, Financial Management, Pearson.

COURSE CODE	MB203
COURSE TITLE	HUMAN RESOURCE MANAGEMENT
COURSE CREDITS	3

Course Description:

This course examines the role of the human resource professional as a strategic partner in managing today's organizations. Key functions such as recruitment, selection, development, appraisal, retention, compensation, and labor relations are examined. Implications of legal and global environments are appraised and current issues such as diversity training, sexual harassment policies, and rising benefit costs are analyzed. Best practices of employers of choice are considered.

Course Objectives:

1. To develop a clear and meaningful understanding of HRM theory, functions and practices.
2. To learn the techniques and methods through which humans are recruited, trained, appraised and compensated.
3. To understand contemporary practices in HRM.
4. To apply human resource management concepts and skills across a variety of contexts, situations and incidents.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
203.1	Remember	DEFINE and explain the basic concepts, functions and processes of human resource management
203.2	Understand	DEMONSTRATE a basic understanding of different tools and aids used in HR planning & HRD.
203.3	Apply	APPLY the principles and techniques of human resource management gained through this course in the discussion of major personnel issues and the solution of typical case problems.
203.4	Analyze	ANALYZE the evolving role of human resources in the global arena.
203.5	Evaluate	EVALUATE the existing and emerging HR strategies in context of external and internal environment.
203.6	Create	DESIGN various HRM processes such as recruitment, selection, training, development, performance appraisals and reward systems, compensation plans.

Course Contents:

Unit 1: Perspectives in Human Resource Management

Concepts of HRM, Evolution of human resource management – The importance of the human factor, Objectives of HRM, Inclusive growth and affirmative action, Role and Competencies of HR, Ethical HRM, Computer applications in HRM, Human resource accounting and audit.

Unit 2: Human Resources Planning

Definition, Need, Process of HRP, Long and Short term planning, Demand Forecasting and Supply

Forecasting, Job Analysis, Job description, Job Specification and succession planning., Concepts of Recruitment and Selection, Sources of Recruitment Difference between Recruitment and Selection, Relative merits and demerits of the different methods, Recruitment and Social Media.

Unit 3: Human Resource Development

Training and Development - Objectives and Needs-Training Process-Methods of Training – Tools and Aids-Evaluation of Training Programs, Executive development program, Compensation Management-Job Evaluation, Wage/ Salary Fixation, Incentives, Bonus, ESOPs, Fringe Benefits, Career Management-career Planning and succession planning, Performance Management System-Definition, Concepts, Different Methods of Performance Appraisal- issues and dilemmas- Rating Errors.

Unit 4: Employee Relation and Employment Law:

Introduction to employee relations, Origin and growth of Labor relations, Labor Laws (Payment of Bonus Act, 1965. Employees Provident Fund and Miscellaneous Provisions Act, 1952. Payment of Gratuity Act, 1972 and Employees State Insurance Act, 1948), Trade Unions, Collective Bargaining, Grievance Handling.

Unit 5: Contemporary practices in HRM

Employee Separations, Dismissal, Resignation, Exit Interviews, Reduction of attrition rate. Downsizing and Outplacement, HRIS.

Prescribed Books:

Sharon Pandey and Basak- Human Resource Management, Pearson Education.

Suggested Readings:

1. Aswathappa, K. Human Resource to Personnel Management, Tata Mc GrawHill.
2. Mamoria C.B and Mamoria S., Personnel Management, Himalaya PublishingCompanySeema Sanghi, HRM, VikasPublishing.

COURSE CODE	MB204
COURSE TITLE	OPERATIONS MANAGEMENT
COURSE CREDITS	3

Course Description:

Operations Management (OM) is concerned with the management of resources and activities that produce and deliver goods and services for customers. The course focuses on the basic concepts, issues, and techniques for efficient and effective operations.

Course Objectives:

1. To understand the strategic role of operations management in creating and enhancing a firm's competitive advantages.
2. To understand key concepts and issues of OM in both manufacturing and service organizations.
3. To apply analytical skills and problem-solving tools to the analysis of the operations problems.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
204.1	Remember	STATE key concepts, theories & frameworks in the field of Operations Management.
204.2	Understand	EXPLAIN various methods of manufacturing, facility layouts used in organizational setup.
204.3	Apply	MAKE USE OF the theories & concepts of Operation Management for effective Production Planning & Control.
204.4	Analyze	EXAMINE the operations data using statistical quality control techniques for improving quality.
204.5	Evaluate	APPRAISE the productivity of the operations process & human resources.
204.6	Create	DEVELOP network diagram for a given project.

Course Contents:

Unit 1: Introduction to Operations Management

Operations as a transformation process, Importance, Functions & challenges, Services as a part of Operations Management,

Quality: Definitions from various Perspectives, Concept of Internal Customer, Overview of TQM and Lean Management,

Types of Processes & Operations Systems (Intermittent & Continuous) - Project production, Jobbing production, Batch Production, Mass & Flow Production, Process Production - Characteristics of each method.

Unit 2: Facility Location, Layout & Inventory Management–

Facilities Location - Factors affecting Facility location, Single location, multi-location decisions. Facility Layout – Strategic Importance, Characteristics of a Good facility layout, Principles and Types of Facilities Layout

Inventory Management - Concept of inventory, need for inventory, Ordering cost, carrying cost, shortage cost, EOQ Model, ABC Analysis – VED (Numerical expected on EOQ Model)

Unit 3: Production Planning & Control

Concept of CPM – Construction of Network Diagram, Identification of Critical Path & Project duration.

Concept of PERT – Application, three time estimates, Probability of completion of project (Numerical expected for CPM & PERT).

Maintenance Management- Importance & types of maintenance

Unit 4: Statistical Quality Control

Concept of Statistical Quality Control, Inspection – Meaning, Types - Cent percent Inspection, Sample Inspection, Operation Characteristic Curve, Control Charts – Meaning, application, Construction & Interpretation– (p, np & c), (Numerical expected for Control Charts), Introduction to Six Sigma

Unit 5: Productivity

Work Study - Objectives, Application & Scope - Methods Study – Flow process chart, Flow diagram & Process mapping

Work Measurement - Elements - Performance Rating - Allowances-Standard Time - concept & calculation -Synthetic Time Standards – Work Sampling (Numerical expected for Standard Time)

Prescribed Books:

1. Production & Operations Management –Chary.
2. Manufacturing & Operations Management -L.C.Jhamb.

Suggested Readings:

1. Operations Management – Krajewski.
2. Operations Management – Mahadevan.
3. Production & Operations Management –Chase.

COURSE CODE	MB205
COURSE TITLE	RESEARCH METHODOLOGY FOR MANAGERS
COURSE CREDITS	3

Course Description :

Research Methods gives essential guidance on how to carry out research projects and it introduces the core concepts, methods and values involved in doing research. This course provides a valuable learning through its comprehensive coverage of methods that are used by experienced researchers investigating the world of business. Researchers find it difficult to conduct an in-depth analysis in their areas of specialization without the sound knowledge of scientific process of conducting research. This course provides an opportunity to understand the crux of research methodology in a scientific and systematic manner.

Course Objectives:

1. To understand basic concepts of research and its methodologies.
2. To identify appropriate research topics.
3. To select and define appropriate research problem and parameters.
4. To prepare a project proposal.
5. To organize and conduct research.
6. To write a research report and thesis.
7. To write a research proposal (grants).

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
205.1	Remember	DEFINE research and Purpose, Significance of research in Social and Business Science, and Ethics in Research.
205.2	Understand	EXECUTE Scales of Measurement and Levels and Types of Measurement Scales
205.3	Apply	IMPLEMENT the feasibility and practicality of research methodology for a proposed project in context of current environment.
205.4	Analyze	EXAMINE Meaning and Purpose of Hypotheses Testing, Steps in Hypotheses Testing, Use of Statistical, Data Editing, Coding, Tabulation, Cross Tabulation, Concept of hypothesis, Procedure in Hypothesis Testing.
205.5	Evaluate	SELECT Types of Parametric and Non Parametric tests
205.6	Create	DEVELOP a research report on a specific topic of interest with proper steps involved in report writing.

Course Contents:

Unit 1: Introduction to Research Methodology

Meaning of research: Purpose, Significance of research in Social and Business Science, and Ethics in Research, Defining research problem: Review of literature; Features of a good Research Design, Types of Research Design.

Unit 2: Research Design Formulation-Sampling and Data Collection

Sampling: Meaning, Characteristics of a good Sample, Sampling Methods, Probability and Non-probability Sampling, Steps in Sampling Design, Sampling Errors. Sources of Data: Primary and Secondary, Methods of collecting primary data: Survey and Observation.

Unit 3: Measurement and Scaling

Scaling techniques: Scales of Measurement and Levels and Types of Measurement Scales, Drafting the questionnaire, Reliability and Validity, Criteria for good measurement.

Unit 4: Data Analysis- Hypothesis Testing

Meaning and Purpose of Hypotheses Testing, Steps in Hypotheses Testing, Use of Statistical, Data Editing, Coding, Tabulation, Cross Tabulation, Concept of hypothesis, Procedure in Hypothesis Testing, Errors in Hypothesis testing, Types of Parametric and Non Parametric tests, Meaning of Correlation, Rank Correlation, Simple Linear Regression Analysis, Multiple Regression Analysis, Issues in Regression, Meaning of Regression Practical problems Chi-square test.

Unit 5: Result Presentation and Report writing

Report Writing – Layout of a Research Paper, Types of Report, Critical elements of a Research Report Techniques of Interpretation, Steps in drafting reports.

Prescribed Book:

Bajpai, N. (2014). Business Research methods. Pearson Education, 5th Impression.

Suggested Readings:

1. Sachdeva, J.K. (2010). Business Research Methodology. Himalaya Publishing House, 1st Edition.
2. Cooper, D.R. and Schindler P.S. (2006). Business Research Methods. Tata McGraw Hill, 9th Edition.
3. Malhotra, N. (2011). Marketing Research – An Applied Orientation. Pearson Education, 6th Edition.
4. Bryman, A. and Bell, E. (2011). Business Research Methods. Oxford, 3rd Edition.

COURSE CODE	MB206
COURSE TITLE	DATA ANALYTICS
COURSE CREDITS	3

Course Description :

This course seeks to present you with a wide range of data analytic techniques and is structured around the broad contours of the different types of data analytics, namely, descriptive, inferential, predictive, and prescriptive analytics.

Course Objectives :

1. To learn about the importance of analytics, data awareness and responsibility.
2. To describe statistics, basic inferential statistics, linear regression, and probability concepts and calculations.
3. To cultivate both innovation and competitive advantage with analytics.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
206.1	Remember	STATE data science concepts, approaches, models and techniques.
206.2	Understand	EXPLAIN various tools , techniques, approaches and models, of data analytics.
206.3	Apply	MAKE USE OF Data Analysis Techniques and Toolkit to solve business problems.
206.4	Analyze	EXAMINE the given data using statistical methods.
206.5	Evaluate	SELECT appropriate data analysis technique to solve the given business problem or situation.
206.6	Create	DESIGN a data analysis plan for the given business scenario or a problem.

Course Contents:

Unit 1: Data Science Concepts

Using the past to predict the future, advantages, disadvantages, Data generation, interpretation and visualisation. Exploratory Data Analysis, Inference Vs Prediction. Management by Facts.

Unit 2: Data Modelling Approach

KRA/KPI, Contextual Data, Data Organisation, Structured Vs Unstructured data, the 5 V's of Business Analytics, Data Analytics framework, Analytics Tools – licensed vs open source, comparison of software features and capabilities.

Unit 3: Data Analysis Techniques

A/B Testing, What-if scenarios, Market Basket Analysis, Classification and Regression Tree, Monte Carlo Simulation, Time Series.

Unit 4: Statistical Models

Statistical Distributions - Normal, Binomial, Poisson. Measuring Central Tendencies, Symmetry, Variability. Correlation, Regression.

Unit 5: Data Science Toolkit

Cluster, Decision Tree, Factor, Regression, Machine Learning, Segmentation Analysis, Sentiment Analysis.

Prescribed Books:

Quantitative Techniques in publishers India Ltd., 4th Edition.

Reference Books :

1. Introduction to operations Research by billey E. Gilett, TMGH.
2. Operation Research by Nita Shah, Ravi Gor, Hardik Soni, PHI.
3. Hastie, Trevor, et al. The elements of statistical learning. Vol. 2. No. 1. New York: springer, 2009.
4. Montgomery, Douglas C., and George C. Runger. Applied statistics and probability for engineers. John Wiley and Sons, 2010.

GBSRC MBA Syllabus

COURSE CODE	MB207
COURSE TITLE	EMOTIONAL AND SPIRITUAL INTELLIGENCE FOR MANAGERIAL EFFECTIVENESS
COURSE CREDITS	3

Course Description :

This course will challenge your beliefs and understanding of leadership and briefly looks at leadership through the ages. The latest leadership trends will be discussed and studied in order to keep your approach to leadership dynamic and current. Emotional and spiritual intelligence are also discussed to ensure a comprehensive understanding of the individual (whether it is someone working with you or yourself). Regenesys' holistic approach allows us to look at your individual responsibility to lead as well as at your development as a leader.

This course will also look into the effect of leadership in an organisation and research ways to ensure your organisation leads the diverse culture and the employees that form part of it. Ways in which organisations and individuals learn from active leadership is also investigated. This course will allow you to identify your current understanding of leadership, how you came to this position of leadership, how you might change your approach to leadership and how these changes can influence an organisation - and maybe even the world.

Course Objectives :

1. To help students understand concepts and give exposure to various viewpoints in the field of emotional intelligence.
2. To understand Human Psychology influencing Human Behaviour and to develop valuable relations with other people, by understanding underlining principles of Human Relations.
3. To help students to sharpen critical thinking, problem solving, and communication skills.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
207.1	Remember	DEFINE Emotional & Spiritual Intelligence and EXPLAIN various associated concepts.
207.2	Understand	SUMMARIZE various models of EI such Ability Based Model of Emotional Intelligence, Trait Based Model, Mixed Model of Emotional Intelligence.
207.3	Apply	USE Emotional Intelligence Models and for enriching overall life experience.
207.4	Analyze	ANALYZE and deal with gender diversity, socio-cultural and other differences at workplace.
207.5	Evaluate	EVALUATE the effectiveness of Emotional Intelligence Models and their contribution to work life balance.
207.6	Create	FORMULATE a framework of Emotional Intelligence which improves work life balance for a given situation.

Course Contents:

Unit 1: Introduction to Emotional Intelligence (EI)

What is EI, The difference between IQ and EQ, Power of Emotions, The Emotional Brain and Amigdala Hijack, Importance of EI in the workplace.

Unit 2: Fundamental Elements of Emotional Intelligence and its impact

Seven Elements defined in Behavioral terms (Self Awareness, Emotional Resilience, Motivation, Interpersonal Sensitivity, Influence Intuitiveness, Conscientiousness.

Unit 3: Fundamental Elements of Emotional Intelligence and its impact

Five Elements defined in Competence terms- Self Awareness, Self Management, Self Motivation, Empathy, Social Skills.

Unit 4: Building Blocks of Emotional Intelligence

Different models- Ability Based Model (Mayer and Salovey), Management Trait Model of Self-Efficacy (K.V. Petrides), Mixed Model (Daniel Goleman).

Unit 5: Social Management and Responsibility

Understand Emotions and How to Manage Them in the Workplace, Role of Emotional Intelligence at Work, articulate your Emotions Using Language. Disagreeing Constructively.

Prescribed Books:

1. Book for reference : Working with Emotional Intelligence: Bloomsbury Publication-Daniel Goleman (1998).
2. Games People Play: The Basic Handbook of TA: Eric Berne (1964).
3. The Brain and Emotional Intelligence: New Insights : Daniel Goleman HBR's 10 Must Reads on Emotional Intelligence (2015).

GBSRC MBA Syllabus

COURSE CODE	MB208
COURSE TITLE	ENTREPRENEURSHIP DEVELOPMENT AND PROJECT MANAGEMENT
COURSE CREDITS	3

Course Description:

Entrepreneurship education plays a very vital role in creating awareness of enterprise and self-employment as a career option for students. Using this framework, students will have experiences that will enable them to develop the insight needed to discover and create entrepreneurial opportunities; and the expertise to successfully start and manage their own businesses to take advantage of these opportunities.

Course Objectives:

1. To create awareness of enterprise and self-employment as a career option for students.
2. To develop positive attitudes towards innovation, enterprise and self-employment.
3. To instill a spirit of Entrepreneurship among the student participants.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
208.1	Remember	DEFINE concepts and characteristics of entrepreneurs.
208.2	Understand	DISCUSS various aspects of entrepreneurship like training, growth and entrepreneurial failures.
208.3	Apply	DEMONSTRATE the role of various government and financial institutions involved in entrepreneurship development.
208.4	Analyze	RELATE the roles of various institutions involved in entrepreneurship development at district, state and national level.
208.5	Evaluate	APPRAISE the issues and challenges of doing business in India.
208.6	Create	DESIGN a business plan for an innovative business idea.

Course Contents:

Unit 1: Entrepreneur and Entrepreneurship

The Entrepreneur: Definitions and Concept Entrepreneurial Traits, Characteristics and Skills, Entrepreneur Vs Professional Managers, Successful Entrepreneurs, Women Entrepreneurs.

Unit 2: Entrepreneurship Development

Entrepreneurship Environment, Entrepreneurship Development Program and Training, Problems of Entrepreneurship, Growth of Entrepreneurs, Entrepreneurial Failures.

Unit 3: Role of Government and Financial institutions

DIC-District Industries Centre, SISI-Small Industries Service Institute, EDII-Entrepreneurship Development Institute of India, NIESBUD-National Institute for Entrepreneurship and Small Business Development NEBD- National entrepreneurship Board of Development.

Unit 4: Doing Business in India

Introduction, Major Issues and Challenges, Ethical approach, Types of Organization, Legal Compliances.

Unit 5: Project Management

Project: Concept and Classification. Search for a Business Idea. Making a Business Plan, Marketing plan, Successful Projects of Social Entrepreneurs.

Prescribed Book:

The Dynamics of Entrepreneurial Development and Management by Desai Vasant, Himalaya Publishing house, Delhi, Fifth Edition, 2014.

Reference Books:

1. P.Saravanavel, Entrepreneurship Development, HimalayaPublishing.
2. Vasant Desai, Problems and Prospects of Small Scale Industries in India, Himalaya Publishing.
3. Peter F. Drucker, Innovation and Entrepreneurship, East-Westpress.
4. Hisrich, Entrepreneurship, Tata McGraw Hill, 6th Edition.
5. P.C.Jain (ed.), Handbook for New Entrepreneurs, EDII, Oxford University Press, New Delhi.

GBS RC MBA Syllabus

COURSE CODE	MB208A (Only for ABM Specialization Instead of MB 208)
COURSE TITLE	ENTREPRENEURSHIP DEVELOPMENT IN AGRICULTURE SECTOR
COURSE CREDITS	3

Course Description:

Concept of Entrepreneur, Entrepreneurship Development, Characteristics of entrepreneurs; SWOT Analysis and achievement motivation, Government policy and programmes and institutions for entrepreneurship development, Impact of economic reforms on Agribusiness/ Agri enterprises, Entrepreneurial Development Process; Business Leadership Skills; Developing organizational skill (controlling, supervising, problem solving, monitoring and evaluation).

Course Objectives:

1. To explain the concept of Developing Managerial skills, Business Leadership Skills (Communication, direction and motivation Skills), Problem solving skill, Supply chain management and Total quality management.
2. To orient Students about Project Planning Formulation and report preparation; Financing of enterprise, Opportunities for agri- entrepreneurship and rural enterprise.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
208A.1	Remember	DEFINE the entrepreneur and entrepreneurship, the Financial Sources for Agri-Startups and the modes of Business Networking.
208A.2	Understand	EXPLAIN various Policies and Programs for entrepreneurs.
208A.3	Apply	IMPLEMENT theories, concepts, policies and programmes in setting up small scale enterprises.
208A.4	Analyze	EXAMINE entrepreneurial traits, Problem solving skills, Managerial skills, Financial skills and HRM skills of an Entrepreneur.
208A.5	Evaluate	SELECT the business ideas and opportunities that exist in market for Agribusiness.
208A.6	Create	DESIGN the Agribusiness plan with Project planning and management.

Course Contents:

Unit 1: Entrepreneur and Entrepreneurship

Concept, Characteristics, functions and classification of entrepreneurs. Role of Entrepreneurship in Economic development, Factors affecting Entrepreneurial Growth: Economic factors, Non-Economic factors, Barriers to entrepreneurship.

Unit 2: Policies and Programmes for Entrepreneurs

Small scale industrial policies, industrial policy resolution 1948, 1956, 1977,1980, 1990, 1991, Entrepreneurial Development Programmes (EDP): Introduction, meaning, phases in entrepreneurial development, importance of EDP, objectives of EDP, Institutions for Entrepreneurship Development: Entrepreneurship Development Institute of India, National

Institute for Entrepreneurship and Small Business Development, Centre for Entrepreneurship Development their objectives and Activities.

Unit 3: Enterprise

Concept and Definition. Types of enterprises, difference between small and large enterprises, Small scale enterprises: Steps in setting up small scale enterprises, role of small scale enterprises in economic development, Farming as a business: Characteristics of farming.

Unit 4: Practical Exercises A

Assessing Entrepreneurial traits, Problem solving skills of an Entrepreneur, Managerial skills of an Entrepreneur, Financial skills of an Entrepreneur, HRM skills of an Entrepreneur.

Unit 5: Practical Exercises B

Identification and selection of business idea, Preparation of business plan, Proposal writing, Visit to Entrepreneurship development Institute.

Prescribed Books :

1. Akhouri, M.M., P. Mishra S.P. and Sengupta, Ritha (1989). Trainers manual on developing entrepreneurial motivation, NIESBUD, NEW Delhi.
2. Entrepreneurship Development Institute of India (1987), Developing New Entrepreneurs, EDIT, Ahmedabad, NISIET. Library: 338-93/EDI/87/25104.
3. Betty Gordan B (1979). Entrepreneurship, playing to win. Taraporewala, Bombay.
4. Mancuso Joseph (1974). The entrepreneur's handbook (1st and 2nd). Arteck House.INC, USA
5. Singh A.K., Lakhansingh, R.Roy Burman (2006). Dimensions of Agricultural Extension. Aman publishing House, Meerut.
6. Khanka S.S. (2001), Entrepreneurial Development chand and company Ltd, 7361, Ramnagar, New Delhi – 110055.
7. Vasant Desai (2004), Dynamics of Entrepreneurial Development and Management.
8. Morgan, C.T. Klng, R.a. Robinson, N.M. (1979). Introduction to psychology-Tata M.Graw Hill Publishing Co., New Delhi.
9. Agarwal R.C. Fundamentals of Entrepreneurship.
10. Hans Raj Bhatia (2003), A Text book Educational Psychology, New Delhi.

MB 209 : DOMAIN ELECTIVES - II (Only 1)

COURSE CODE	MB209I
COURSE TITLE	MANAGEMENT OF AGRICULTURE AND ALLIED SCIENCES
COURSE CREDITS	2

Course Description:

Course introduces the knowledge about various inputs like Seeds, Pesticides, Fertilizer, Bio fertilizer, Nutrient for increase the productivity and farming of Horticulture crop, Livestock farming, Aquaculture, Mushroom cultivation, Irrigation and output industries, also get the knowledge of various laws in our Country related to input and output industries. That helps students for the development of technical knowledge in Agro Industries.

Course Objectives:

1. To know the various input and output industries in Agriculture and Allied Sciences.
2. To know the various prevalent laws in our Country related to input and output industries.
3. To know the present needs of input and output industries so that students should work confidently when they get jobs in such industries.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
209I.1	Remember	DEFINE the various concepts of Agriculture and its allied sciences.
209I.2	Understand	DESCRIBE various management techniques in Horticulture and Mushroom Industry.
209I.3	Apply	EXECUTE the managerial practices in allied sector.
209I.4	Analyze	EXAMINE the Farm Engineering requirements in management of sustainable agriculture.
209I.5	Evaluate	SUPPORT the best practices in livestock production and value addition in animal product.
209I.6	Create	DESIGN effective water management plan for sustainable agriculture.

Course Contents:**Unit 1: Management of Seed, Crop protection, Pesticide, Fertilizer and Bio fertilizer Industry**

Various types of seeds, advantages of F1, F2, Hybrid, BT, Research, Certified and truthful seeds, Need and types of crop protection chemicals, fertilizers and micronutrients, Major Companies, Market Potential, SWOT Analysis.

Unit 2: Horticulture and Mushroom Industry :

Fruit Production and Post Harvest Management, Management of Floriculture and Landscaping,

Vegetable Production, Hi-tech Agriculture, Mushroom: Introduction, Importance and Types of Mushroom.

Unit 3: Livestock Production and Value addition in animal product

Scope of livestock in Indian Economy, Trends in livestock production, Nutrient requirement of livestock and poultry, Maintenance of record of livestock dairy and poultry farms, Animal health insurance, Trends in marketing and utilization of animal products, Market standards and regulation animal products.

Unit 4: Farm Engineering

Farm Power and Machinery Management, Renewable Energy Resource Management, Major companies, Role of Government in Equipment Industry, SWOT Analysis.

Unit 5: Water Management Industry

Need of water management, Types and advantages of water management systems, Major Companies, Role of Government in Water Management Industry, SWOT Analysis.

Prescribed Books :

1. Marketing of seeds, Premjit Sharma, Gene Tech Book.
2. Horticulture Marketing, FAO Agricultural Service Bulletin, Daya Publishing House.
3. Commercial Production of Horticultural Crops, KunalMitra, Oxford Book Company.
4. Food and Nutrition, Mahindraa Deshpande, Dr. Nikhilesh Kulkarni, Himalayan Publishing House.
5. Principles of Agri-Engineering, Volume-I, T P Ojha, A M Michael, Jain Brothers, New Delhi.
6. Changing Face of processed food industry in India, Rajat K Baisya, Ane Book India.
7. Marketing of vegetables in India, VigneshwaraVarmudy, Daya Publishing House, New Delhi.
8. Food Technology and Entrepreneurship Management, Dr. C R Bharatia, urendra Publications.

COURSE CODE	MB209II
COURSE TITLE	FINANCIAL MARKETS AND SERVICES
COURSE CREDITS	2

Course Description :

The Course aims at providing the students, basic knowledge about the Finance concepts, markets and various services provided in those markets. The syllabus is structured in a way which provides adequate information about the roles of intermediaries and its regulating bodies. The course also provides information about the prevailing financial system in India.

Course Objectives :

1. To acquire the skills necessary to manage financial firm
2. To describe and apply financial concepts, theories, and tools
3. To evaluate the role of technology and the legal, ethical and economic environment as it relates to financial institutions including the Reserve Bank of India, commercial banks, insurance companies, mutual funds, investment banks, pension funds, and regulatory agencies.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
209II.1	Remember	DEFINE the key terminologies of Financial Markets and Services, Indian Financial and Banking systems.
209II.2	Understand	DESCRIBE the various types of financial products and services.
209II.3	Apply	DEMONSTRATE financial understanding with respect to financial products and services.
209II.4	Analyze	COMPARE and CONTRAST the various types of financial products and services and ILLUSTRATE their benefits and limitations.
209II.5	Evaluate	SELECT financial products and services from an investment perspective for various kinds of investors.
209II.6	Create	DEVELOP answers to investor's FAQ's for each kind of financial products and services.

Course Contents:

Unit 1: Indian Financial System

Overview of Indian Financial System and Market development since 1991. Types and Role of Financial Intermediaries in Financial System.

Unit 2: Indian Banking System

Structure of Indian Banking System, Role of Reserve Bank of India as a regulatory body, Functions of Reserve Bank of India, Definition of Bank, Relation of Banker and Customer, Functions of Commercial Bank. Types of Banks. New Age Banking. NBFCs.

Electronic Banking and IT in Banking: Communication Networks in Banking System, IT Applications in Banking –Internet, SWIFT, Automated Clearing Systems, Electronic Fund Management, Electronic Clearing System (ECS), Real Time Gross Settlement (RTGS), National

Electronic Funds Transfer (NEFT), Indian Financial System Code (IFSC), Automated Teller Machines (ATMs), Internet Banking, Core Banking Solutions (CBS), Computerization of Clearing of Cheques, Cheque Truncation System (CTS).

Unit 3: Financial Market

Structure of Financial Market, Instruments used in Money Market – Call Money Market, Treasury Bills Market, Commercial Bills Market and Certificate of Deposits. Instruments used in Capital Market – Equity and Debt.

Unit 4: Financial Services

Brief Overview and functions of Mutual Funds, Insurance, Wealth Management, Advisory Services, Merchant Banking Services.

Unit 5: Merger and Acquisition

Introduction to Mergers and Acquisition, Forms of expansion, Reasons for merger, Legal and Procedural aspects of Merger.

Prescribed Books:

- 1) G.S.Batra – Financial Services and Market.
- 2) Meir Khan – Financial Institutions and Markets, Oxford Press.
- 3) L M. Bhole, Financial Institutions and Market, Tata McGraw Hill
- 4) V.A. Avadhani, Marketing of Financial Services, Himalaya Publishers, Mumbai.
- 5) Vasant Desai, Indian Financial Systems, Himalaya Publishers Books for Reference.

Suggested Readings:

1. L. M. Bhole, Financial Institutions and Markets, TATA McGraw Hill.

GBSRC MBA Syllabus

COURSE CODE	MB209III
COURSE TITLE	TRAINING AND DEVELOPMENT
COURSE CREDITS	2

Course Description :

This course provides students with an overview of the role of Training and Development in Human Resource Management. The key elements covered include: needs analysis, program design, development, administration, delivery and program evaluation. Other topics include adult learning theory, transfer of training, career planning, counselling, training techniques, budgeting and trends in training.

Course Objectives :

1. To understand the concepts of training and development as a tool of transformation.
2. To familiarize with the process of training and development to ensure desired out comes.
3. To understand various training and development tools and techniques.
4. To familiarize with evaluation design to asses training program effectiveness

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
209III.1	Remember	DEFINE the basics of existing practices related to training and development in the organizations.
209III.2	Understand	EXPLAIN the systematic process of learning theories and styles.
209III.3	Apply	MAKE USE OF training needs assessment to adopt appropriate techniques and tools for training.
209III.4	Analyze	COMPARE and analyze various methods available for each step of training execution.
209III.5	Evaluate	JUSTIFY post-training evaluation results and role of trainers as change agents.
209III.6	Create	DESIGN an effective Training and Development plan for a company.

Course Contents:

Unit 1: Introduction to Training and Development

Meaning, Importance of Training and Development, Difference between Training and Development, Factors influencing working and learning.

Unit 2: Learning Process and Training

Learning Through Training, Adult Learning, Learning Theories and Learning Curve, Learning Styles.

Unit 3: Training Design and Administration

Need Assessment –Importance and Process, Implementing Training Programs (Training methods), Technique and Aids, E-learning and Use of Technology in Training. Developing Training Modules.

Unit 4: Evaluation of Training

Training Evaluation andamp; ROI, Measurement Toolsand Technique, Feedback Mechanism.

Unit 5: Trainer as a Change Agent

Trainer and his Role; Concept, Importance and Process of Coaching, Counseling and Mentoring.

Prescribed Books:

1. Noe, R.A. (2008), Employee Training and Development. McGraw-Hill.
2. Aswathappa, K. Human Resource to Personnel Management, Tata Mc Graw Hill.
3. Mamoria C.B and Mamoria S., Personnel Management, Himalaya Publishing Company.
4. Gary Dazzler, Human Resource Management, Pearson Education.

GBSRC MBA Syllabus

COURSE CODE	MB209IV
COURSE TITLE	PHARMACEUTICAL MANAGEMENT
COURSE CREDITS	2

Course Description:

Our pharmaceutical companies are trying their best to achieve remarkable export sale in the international markets. This also provides quality management with special focus on pharmaceutical management for developing business leaders by nurturing knowledge, skills, communication, attitudes and behavior. Pharmaceutical export is contributing to the GDP of the country and every year this contribution is positively growing. The content of the course is designed to address the challenges facing the pharmaceutical industry. The Indian pharmaceutical company has been built from an industry that copies patent drugs and manufactures them inexpensively. Now it is counted amongst the industries that are fuelling India's economic growth and holds enormous potential. Indian-based pharmaceutical companies are also predicted to gain considerable market share in the world. It holds rank worldwide, in terms of technology, quality and range of medicines manufactured. Thus the course concentrates on the Pharmaceutical Export: Facts and Challenges that should not be ignored.

Course Objectives:

1. To understand and explain the concept, principles and functions of management and human resource management along with evaluation techniques for job and career planning.
2. To know and understand the principles and functions of material management and inventory control and also understand the concept of production management in detail.
3. To recall and explain the functions of pharmaceutical marketing and understand salesmanship and activities related to it like recruitment, selection, training, compensation.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
209IV.1	Remember	DEFINE various concepts in production management and packaging.
209IV.2	Understand	EXPLAIN major concepts like 7P's, segmentation in pharmaceutical marketing.
209IV.3	Apply	DEMONSTRATE various concepts in product planning.
209IV.4	Analyze	EXAMINE the financial aspects of pharmaceutical product planning.
209IV.5	Evaluate	EVALUATE the projects on the basis of various financial, economic and social criteria.
209IV.6	Create	DEVELOP 7 P's for a hypothetical pharmaceutical product.

Course Contents:

Unit 1 : Production Management

Fundamentals of production, organization, economic policy, manufacturing economics, production capacities, production lines and job balancing, visible and invisible inputs, methodology of activities. Production planning and control, production processes Considerations for design of large scale manufacturing units including intricate design criteria for units to manufacture sterile and non-sterile products with special reference to tablets, capsules, and injections. Design and development of packaging units including recent advances in packaging techniques for various types of sterile and non-sterile dosage forms. Warehousing design, construction, maintenance and sanitation; good warehousing practice, materials management.

Unit 2: Pharmaceutical Marketing

Evolution of marketing concept; production oriented, sales oriented, promotion oriented and consumer oriented (modern concept); market segmentation; concept of marketing, mix Role of 7 P's (Product, Price, Promotion, Place, Physical Evidence, Process, People) in Pharmaceutical Marketing Management, corporate planning and strategy, Pharmaceutical industrial marketing management. Pharmaceutical marketing environment. Product management. E-Pharma Marketing.

Unit 3: Product Planning

Selection of product, new product development and product differentiation, pricing, promotion – personal selling; salesmanship, qualities of salesman, management of sales force, advertising, publicity and window display, channels of distribution. Marketing Research: Definition and importance, Pharmaceutical Marketing Research techniques, marketing information system, pharmaceutical marketing research area. Market Demands and Sales Forecasting: Major concepts in the demand measurement, estimating current demands, geo-demographic analysis, estimating industry sales, market share and future demand, sales forecasting.

Unit 4: Introduction to financial management:

Financial planning and control, working capital management, management of fixed assets. Concepts and techniques of financial management decision, concepts in evaluation – time value of money, valuation of a firm's stock, capital assets pricing model, investment in assets and required returns, risk analysis, financing and dividend policies, capital structure decision, working capital management, management of cash, management of accounts receivable, inventory management, Evaluation of investment decisions by pay back period, accounting rate of return, net present value methods, break even analysis.

Unit 5 : Project Evaluation

Project definition, preparation of feasibility assessment and selection, project reporting, conventional project appraisal; limitations, towards a new framework, Projections, profitability, cost and benefit analysis, appraisal criteria – financial, economic and social, Risk analysis.

Prescribed Textbook:

1. Management accounting by Khan and Jain; Tata Mc Graw Hills.
2. Cost Accounting Methods and Problems by BHAR; A P Academics.
3. Cost Accounting Principles and Practice by Dutta; Pearson.

Suggested Readings:

1. Product Management by Lehmann IV th edition; Tata Mc Graw Hills.
2. Project Management- The Managerial Process by Gray and Larson; Tata Mc Graw Hills
3. Investment and Portfolio Management by M. Ranganathan; Pearson Publication.

COURSE CODE	MB209V
COURSE TITLE	APPLICATION AND METHODOLOGY OF BIOTECHNOLOGY
COURSE CREDITS	2

Course Description:

Biotechnology can be broadly defined as "using organisms or their products for commercial purposes." As such, (traditional) biotechnology has been practiced since the beginning of recorded history. It has been used to bake bread, brew alcoholic beverages, and breed food crops or domestic animals. But recent developments in molecular biology have given biotechnology new meaning, new prominence, and new potential. It is (modern) biotechnology that has captured the attention of the public. Modern biotechnology can have dramatic effect on the world economy and society.

Course Objectives:

1. To acquaint the students with the significance of Methodology of Biotechnology.
2. To familiarize the students with the different analytical and Molecular techniques in the Biotechnology.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
209V.1	Remembering	The student will be able to DEFINE various tools and techniques in Biotechnology.
209V.2	Understanding	The student will be able to EXPLAIN the significance of methodology of Biotechnology.
209V.3	Applying	The student will be able to CHOOSE the various analytical and molecular techniques.
209V.4	Analysing	The student will be able to CATEGORIZE the Transgenic Plants and Animals.
209V.5	Evaluating	The student will be able to CRITICIZE the Hybridoma technology.
209V.6	Creating	The student will be able to COMPILE various techniques of Bioinformatics.

Course Contents:

Unit 1: Plant Tissue culture

Primary culture, callus, Somaclonal propagation, application, Scope and applications Pharma and agriculture-products, new bio products, tissue culture based products, crop improvement and protection, floriculture, herbal medicine.

Unit 2: Animal Tissue culture

Animal cell culture- basics and techniques, organ culture, application, Recombinant DNA technology- Restriction endonucleases, Gene Cloning, genome library, Vectors, Plant and animal Vectors, molecular cloning strategies.

Unit 3: Introduction to Plant Biotechnology

Transgenic Plants, Introduction to Animal Biotechnology, Transgenic animals.

Unit 4: Hybridoma technology

Basics of immunology, Immunization techniques, Hybridoma technology and applications.

Unit 5: Bioinformatics

Data Analysis- Accessing databank, sequence analysis, BLAST, sequence comparison, multiple alignments, Clustal W, protein structure prediction.

Prescribed Books:

1. B. D. Singh, Biotechnology, Kalyni Publishers, 1st Edition.
2. Kumar H. D., Textbook of Biotechnology, East-West Press.
3. Attwood T. K., D. J. Parry-Smith, Introduction to bioinformatics, Pearson Education.
4. Rastogi, Bioinformatics: Methods and Applications, Prentice Hall India, 2nd Edition.
5. David Mount, Bioinformatics: Sequence and Genome analysis.
6. Stephen and David, Introduction to Bioinformatics: A theoretical and practical approach.

GBSRC MBA Syllabus

COURSE CODE	MB209VI
COURSE TITLE	IT IN BUSINESS MANAGEMENT
COURSE CREDITS	2

Course Description:

This course is to providing computing, telecommunications, networking infrastructure and audio visual support to academic and administrative programs and services. The information technology implements cost effective solutions that enhances the organization`s ability to provide a quality education for students and it gives administrators and faculty the means to operatesuccessfully.

Course Objectives:

1. To develop skill for maintaining a reliable and scalable information technology infrastructure, enabling innovative uses of technology for educational excellence.
2. To develop a technology governance process which includes input from all clients.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
109VI.1	Remember	DEFINE the concepts, various tools, softwares used.
109VI.2	Understand	DESCRIBE the various uses of computer networking and internet.
109VI.3	Apply	DEMONSTRATE the expertise in Information Technology tools such as MS Excel, MS Word and MS Powerpoint etc.
109VI.4	Analyze	DIFFERENTIATE between various IT technologies used in Business.
109VI.5	Evaluate	SELECT the appropriate frameworks and models for successful e-commerece.
109VI.6	Create	DESIGN and develop scocial media marketing campaign.

Course Contents:

Unit 1: Information Technology Framework

Information System Functionality- Comprehensive Information System Integration-Communication Technology-Rationale For ERP Implementation-ERP System Design-Supply Chain Information System Design.

Unit 2: Impact of Globalization andInformation Technology on different areas of management practices.

Unit 3: Information Technology in Supply Chain

Role and Importance of IT in Supply Chain Management, IT solutions for Supply Chain Management, Supply Chain Information Technology in Practice.

Unit 4: Global IT Management

Introduction, Challenges and Opportunities of IT in Global Market.
Unit 5: Ethical issues of IT in Business.

Prescribed Books:

1. Management Information System: Jawadekar.
2. Management Information System: Laudon and Laudon.
3. The Essential Guide to Knowledge management: Amrit Tiwana.

Reference Books:

1. Douglas Long International Logistics: Global Supply Chain Management Springer-Verlag New York, LLC; 2004.
2. Information Technology Enabled Services – Vol. 1 and 2 (ICFAI University Press).

GBSRC MBA Syllabus

COURSE CODE	MB209VII
COURSE TITLE	EXPORT AND IMPORT MANAGEMENT
COURSE CREDITS	2

Course Description:

Globalization has affected all countries of the world and global trade is growing at pace that makes it importance for business to stay attuned to the changing world economy. Till the early 1990s, most of the countries were closed economies there were quantitative restrictions on import and stringent restrictions on foreign investment. The emerging economies along with the development countries have assumed an importance role in the field of international trade.

Course Objectives:

1. To help in understanding of EXIM procedures assumes greater significance in today's global world.
2. To understand the procedures, regulations, stipulations, provisions and opportunities involved in export and import.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
209VII.1	Remember	DEFINE the basic concepts and STATE the important aspects of EXIM procedures.
209VII.2	Understand	EXPLAIN the implications of various market entry strategies in international markets.
209VII.3	Apply	DEMONSTRATE the use of various methods of payment used in international trade.
209VII.4	Analyze	EXAMINE export opportunities in international markets.
209VII.5	Evaluate	DIFFERENTIATE AND COMPARE between various method of payment, right types of Letter of Credit, Right Pricing and right market entry strategy.
209VII.6	Create	FORMULATE a suitable export and import strategy by studying various facts given in the case and suggest suitable strategy.

Course Contents:

Unit1: Understanding International Trade Environment

Introduction to Export and Import Management : Nature and Defined of Export Management, Need and Features of Export Management, Motivation for Export, Process of Export Management, Functions of Export Manager.

International Trading Environment : Multilateral Trading System Uruguay Round, Measures for Protection of Domestic Industries Trade Block and Trade Agreement, Implication for Market Entry Strategies.

Organizing and Registration of Export and Import Process : Nature of Export Firm, Setting up

an Export Firm, Procedure for the Allotment of Importer and Exporter Code Number, Registration of Export Firm, Starting Export Business Tips.

Unit 2: Managing Exports Business

Method of Payment : Nature / Method of Payment Terms, Advance Payment, Open Account, Letter of Credit (Form and Type of L/C), Documentary Collection, Instruments of Payment (Incoterms).

Export Pricing Decision : Nature of Pricing Decision, Price Defined, Structure of Cost, Setting price and Price Negotiation, Content of an Export Price Quotation.

Unit 3: Execution of Export Order

Export – Import Documentation, Procedures and Steps : Steps for Successful Exporting, Export –Import Documentation.

Business Risk Management and Coverage : Risk Management in Export –Import Business, Types Of Risks, Quality and Pre-Shipment Inspection.

Export Contract and Incoterm : Incoterm –Terms and Condition, Purpose and Scope of Incoterm, The Structure of Incoterms, Incorporation of Incoterms into the contract of sale, Incoterm Group.

Unit 4: Post Export Follow up

Customs Clearance of Export Import Cargo : Clearance of Export Cargo, Clearance of Import Cargo, Customs Valuation.

Export Incentive Schemes : Duty Exemption Schemes, Duty Remission Schemes, Export Promotion Capital Goods Scheme, Special Economic Zones.

Unit 5 : Import Procedures

Types of Importer, Import of Unrestricted Item, Import of restricted Item, Import Clearance and Documents, Cargo Handling and Demurrage Charges, Application Fee for Import Licences.

World Shipping and Containerization : Overview of Shipping Operation, Types of Ships and International Trade, Need and Type of Containerization, Inland Container Depots.

Prescribed Books:

1. Export Import Management By Justin Paul and Rajiv Aserkar, Oxford Publishing.
2. Export Management, BY P.K.Khurana, Galgotia Publishing.

Reference Books:

1. Export and Import Management By Aseem Kumar, Anurag Jain Publishing.

COURSE CODE	MB209VIII
COURSE TITLE	HOSPITAL ADMINISTRATIONS
COURSE CREDITS	2

Course Description:

The Masters in Hospital Administration is aimed towards orienting and developing students for executive positions in hospitals. The course develops the managerial skills of individuals and also exposes them to clinical aspects of hospital management. The students have the option of developing their skill set in a particular area of hospital management while taking the optional modules.

Course Objectives:

1. To work in teams and help in team building across different faculties and departments in the hospital.
2. To identify problem areas and integrate practices that help towards quality improvement.
3. To self-assess and participate in continuous professional development.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
209VIII.1	Remember	STATE functions, roles in Primary Healthcare Management.
209VIII.2	Understand	DESCRIBE roles and responsibilities of Hospital Administrator.
209VIII.3	Apply	MAKE USE of the Hospital Administrator's necessary skills for effective Hospital Administration.
209VIII.4	Analyze	RELATE Hospital Operations Management with OPD, Inpatient, ICU, OT, Accident and Emergency, Daycare, Nursing services, Diagnostic services and other services.
209VIII.5	Evaluate	CONTRAST Human Resource Management and Operations Management in relation to Hospital Administration.
209VIII.6	Create	CONSTRUCT the Hospital Operations Management Plan for the Healthcare and Allied Services.

Course Contents:

Unit 1: Hospital Organization:

Hospital Organization - Structure, Function, Role in Primary Health Care.

Unit 2: Hospital Administrator:

Hospital Administrator - Roles/ Responsibilities. Skills of A Hospital Administrators.

Unit 3: Clinical and clinical-supportive departments:

OPD, Inpatient, ICU, OT, Accident and Emergency, Nursing Services, Diagnostic (Lab/Radiology), Day Care, pharmacy and drug store.

Unit 4: Ancillary departments:

Hospital Records/HIS, Dietary Services, CSSD, Laundry Services, Bio Medical Services, House Keeping/ Maintenance Services, Bio-medical waste management, public relations, Quality assurance

Unit 5: Administrative departments:

Human Resource /Personnel Management, Materials Management in Hospital, Quality Management in Hospitals, Laws and Ethics Related to Hospitals and Financial Management in Hospitals.

Reference Books:

1. Hospital Administration by D. C. Joshi and Mamata Joshi, 2009.
2. Hospital Management by S M Zha, 2011.

GBSRC MBA Syllabus

COURSE CODE	MB209IX
COURSE TITLE	PRODUCTION AND OPERATIONS MANAGEMENT
COURSE CREDITS	2

Course Description:

The management of the efficient transformation of inputs into outputs to suitably satisfy customers. Inputs are materials, labor, capital and management. Outputs are products or services, which customers want and often pay for. The course provides an introduction to the operations and the related management concepts. The level of discussion varies from strategic to daily control of business processes.

Course Objectives:

1. To decide plant location and plant layout.
2. To understand how Operations can be planned effectively.
3. To understand inventory management.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
209IX.1	Remember	STATE the key concepts, theories & frameworks in the field of Production and Operations Management.
209IX.2	Understand	EXPLAIN facility planning, layout and material handling.
209IX.3	Apply	IMPLEMENT the relevant theories for management of inventory in organizational setup.
209IX.4	Analyze	COMPARE & CONTRAST between various facility layouts used in industrial setup.
209IX.5	Evaluate	SELECT an appropriate quality management technique and certification for an organization.
209IX.6	Create	DESIGN Production Plans considering quality and maintenance as per organizational requirement.

Course Contents:

Unit 1: Production Management

Integrated Production Management, System Productivity, Capital Productivity, Labour Productivity, Personnel Productivity, Training, Nature and scope of Operations: Functions of Operations Management, System's perspective, Challenges in Operations Management, Competitiveness, Types of Manufacturing and service Systems.

Unit 2: Facilities Planning, Layout and Material Handling

Location , factors affecting size of the firm, factors affecting plant location, economic survey of the site selection , computation of investment and cost of production and distribution , factors and location rating, break even analysis for facility location planning, simple median model, centre of gravity method, Plant layout, material flow system, process layout, product layout, mixed layout, project layout, cellular layout, process charts, flow diagram, travel chart, RELchart.

Unit 3: Inventory Management, Production planning and control

Continuous Inventory Systems, Periodic Inventory system, Two- bin system, The ABC classification, EOQ methods, Order quantity with variable demand, order quantity for a periodic inventory system, Production planning Hierarchy, Aggregate planning, Level strategy, Chase strategy, Mixed strategy, Disaggregating the aggregate plan, Rough Cut Capacity planning, Material Requirement planning.

Unit 4: Quality Management

Meaning, cost of quality, contribution of famous quality Guru, TQM, Six Sigma, SQC, Quality certification.

Unit 5: Maintenance Management:

The Maintenance Function, Equipment Life Cycle, Measures of Maintenance Performance, Maintenance Strategies, Total Productive Maintenance.

Prescribed Books:

1. Production and Operations Management – Chary - Tata McGraw- HillPublications.
2. Operations Management for Competitive Advantage – Chase, Aquilano, Jacobs, Agarwal, Tata McGraw- Hill Publications.

COURSE CODE	MB209X
COURSE TITLE	APPLICATIONS OF BUSINESS ANALYTICS
COURSE CREDITS	2

Course Description :

Analytics has been defined as the extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decisions and actions. Analytics is more than just analytical methodologies or techniques used in logical analysis. It is a process of transforming data into actions through analysis and insights in the context of organizational decision making and problem solving. Analytics includes a range of activities, including business intelligence, which is comprised of standard and ad hoc reports, queries and alerts; and quantitative methods, including statistical analysis, forecasting/ extrapolation, predictive modeling (such as data mining), optimization and simulation.

Course Objectives:

1. To introduce the fundamental ideas behind optimization technology to the extent that you can utilize this knowledge to build your own solvers based on various paradigms.
2. To gain an understanding of how managers use business analytics to formulate and solve business problems and to support managerial decision making.
3. To learn how to use and apply Excel and Excel add-ins to solve business problems.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
209X.1	Remember	STATE data science concepts required in Business Analytics
209X.2	Understand	EXPLAIN data analytics approaches and data analytics techniques.
209X.3	Apply	USE Statistical methods and data analytics tools to solve business problems or scenarios.
209X.4	Analyze	COMPARE & CONTRAST inference and prediction, structured and unstructured data, licensed and open source software for data analytics
209X.5	Evaluate	SELECT an appropriate data analysis and tools for the given business problem or situation.
209X.6	Create	DESIGN a data analysis for the given business problem or situation.

Course Contents:

Unit 1: Data Science Concepts

Using the past to predict the future, advantages, disadvantages, Data generation, interpretation and visualisation. Exploratory Data Analysis, Inference Vs Prediction. Management by Facts.

Unit 2: Data Modelling Approach

KRA/KPI, Contextual Data, Data Organisation, Structured Vs Unstructured data, the 5 V's of Business Analytics, Data Analytics framework, Analytics Tools – licensed vs open source, comparison of software features and capabilities.

Unit 3: Data Analysis Techniques

A/B Testing, What-if scenarios, Market Basket Analysis, Classification and Regression Tree, Monte Carlo Simulation, Time Series.

Unit 4: Statistical Models

Statistical Distributions - Normal, Binomial, Poisson. Measuring Central Tendencies, Symmetry, Variability. Correlation, Regression.

Unit 5: Data Science Toolkit

Cluster, Decision Tree, Factor, Regression, Machine Learning, Segmentation Analysis, Sentiment Analysis.

Prescribed Books:

1. Kerns, G. J. (2010). Introduction to probability and statistics using R. Publisher: G. Jay KJerns.
2. Verzani, J. (2014). Using R for introductory statistics - 2nd Edition. New York: Chapman and Hall.
3. Webster J.C. and Albert M.Cook, —Clinical Engineering Principle and Practicel, Prentice Hall Inc., Englewood Cliffs, New Jersey, 1979 (Unit I).
4. Goyal R.C., — Handbook of hospital personal managementl, Prentice Hall ofIndia.

GBS RC MBA Syllabus

COURSE CODE	MB210
COURSE TITLE	INDUSTRY SECTORAL ANALYSIS
COURSE CREDITS	1

Course Description :

Industry sectoral analysis is the analysis of a specific branch of manufacturing, service, or trade. Understanding the industry in which a company operates provides an essential framework for the analysis of the individual company that is, company analysis. Equity analysis and credit analysis are often conducted by analysts who concentrate on one or several industries, which results in synergies and efficiencies in gathering and interpreting information.

Course Objectives:

1. To learn assessment of the economic and financial condition and prospects of a given sector of the economy.
2. To give exposure to the students about different business domains and verticals.
3. To make the students to do desk research and understand profile of various industries.
4. To provide an understanding of the role of market research and analytics in the society and business, and create an awareness of the processes involved in designing and planning an effective research.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
210.1	Remember	RECALL important concepts related to industry chosen
210.2	Understand	EXPLAIN industry specific characteristics
210.3	Apply	IDENTIFY various factors effecting the industry
210.4	Analyze	EXAMINE the challenges faced
210.5	Evaluate	ASSESS the future growth potential
210.6	Create	CONSTRUCT a suitable summary based on the study

Course Contents:

All the students need to undergone compulsorily through 'Industry Sectoral Analysis' course for 1 credit. The course is like a Desk Research. The students can choose any one industry sector from the economy for their study as per their choice and interest.

The Institute will provide the guidelines to the students for how to conduct the Industry Sectoral Analysis study. The Institute will also allot the guides for every student for monitoring the progress of the course and report. At the end of semester students need to submit spiral hard bound copy of report to their respective guides and also need to appear for presentation and viva-voce.



**GLOBAL BUSINESS SCHOOL AND RESEARCH CENTRE
DR. D. Y. PATIL VIDYAPEETH, PUNE**

(Accredited (3rd Cycle) by NAAC with a CGPA of 3.64 on four point scale at 'A++' grade)
(An ISO 9001:2015 & 14001 :2015 Certified University)

Name of the Programme : MBA

Name of Semester : SEMESTER III

COURSE CODE	MB301
COURSE TITLE	STRATEGIC MANAGEMENT
COURSE CREDITS	3

Course Description:

Organisations face increasing environmental uncertainty with shortening product and technology life cycles and increasing competition. Managers need to develop an understanding of their organisation's industry structure, external environment as well as its internal strengths and weaknesses. It is also important that managers are able to think creatively in formulating and implementing their strategies to ensure their organisation's success in its industry. This course, therefore, focuses on providing future managers with relevant strategic management concepts to advance their skills and abilities so that they can contribute towards an organisation's competitive advantage.

Course Objectives:

1. To develop an understanding of Strategy and Policy Making among students.
2. To develop an ability to apply various tools and techniques such as Corporate and Business Strategies to real world business problems.
3. To develop Graduates who are socially responsible and responsive to the needs of the society.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
301.1	Remember	STATE various concepts, models and theories of Strategic Management.
301.2	Understand	DISCUSS various concepts, Models, Techniques of Strategic Management Phases (i.e. Formulation, Implementation, Evaluation)
301.3	Apply	DEMONSTRATE the various tools and techniques used for strategy evaluation and Control, industry analysis .
301.4	Analyze	RELATE the types of strategies with reference to Corporate Level, Business Level Strategies
301.5	Evaluate	APPRAISE techniques of Strategic Evaluation and Control, blue ocean strategy and Red ocean strategy.
301.6	Create	DESIGN a Strategic Management Plan with the use of appropriate strategies of different stages of strategic management process.

Course Contents:

Unit 1: Introduction to Strategic Management and Business Policy decisions, Environmental appraisal, corporate level strategies, Business level strategies, Strategic management in Indian firms, Practices and cases

Introduction to business policy and strategy, concept of strategy. Corporate, business and functional levels of strategy. Introduction to Strategic Management, definition of strategic Management, elements of strategic management, model of strategic management processes,

strategic management vs operational management. Stakeholders in business.

Hierarchy of Strategic Intent: Understanding strategic intent, concept of stretch and fit, vision, mission, business definition, business model, goals and objectives.

Unit 2: Strategy Formulation

Concept of environment, characteristics of environment, internal and external environment, environmental sectors, environmental scanning, appraising the environment, Industry analysis- Porter's five forces model of competition, competition analysis and competitive edge, ETOP.

Organizational appraisal: Company internal environment, organizational appraisal, concept of value chain, value chain analysis, organizational capability factors, structuring organizational appraisal, SWOT.

Corporate Level Strategies: Concentration, integration, diversification, internationalization and cooperation, stability, retrenchment and restructuring, merger and acquisition strategies, achieving acquisition success, effective acquisition.

Business Level Strategies: Managing relationship with customers, purpose of business level strategies, foundations of business level strategies, positioning of firm in industry, business strategies for different industry conditions, cost leadership strategy, differentiation strategy. Strategic analysis and choice.

Strategic alternatives, strategic analysis, contingency strategies.

Tools and techniques for strategic analysis, GE 9 cell model, Portfolio analysis- BCG matrix, experience curve, impact matrix.

Unit 3: Implementing strategic plan

Implementing strategic plan – Role of chief executive officer and the board of directors, Role of top management – Power games – Strategic management in MNC, functional and operational implementation, corporate culture, structure and organizational values.

Unit 4: Strategic Evaluation

Operations control and Strategic control, Techniques for Strategic Evaluation and Control, Symptoms of malfunctioning of Strategy.

Unit 5: Blue Ocean Strategy

Principles of Blue Ocean strategy, Concepts of Red Ocean Strategy, Difference between Blue ocean and Red ocean strategy.

Prescribed Books:

1. Exploring Corporate Strategy, Gerry Johnson, Kevan Scholes, Richard Whittington, 2009, Pearson Ed Ltd, United Kingdom, 2nd Ed.
2. Crafting and Executing Strategy Arthur A Thompson Jr, Strickland A.J., John E. Gamble and Arun K. Jain, McGraw Hill Education Private Limited, New Delhi.
3. Strategic Management Michael Hitt, Ireland, Hoskisson, 2010, Cengage Learning, New Delhi.
4. Strategic Management – Concepts and Cases, Fred R. David, 2010, PHI Learning, New Delhi.
5. Business Policy and Strategic Management (Text and Cases), Subba Rao, P 2010.

COURSE CODE	MB302
COURSE TITLE	START UP AND NEW VENTURE MANAGEMENT
COURSE CREDITS	3

Course Description:

This course provides students with analytical frameworks for assessing entrepreneurial potential and management skills development, including researching and creating a business plan. Topics include: small business and marketing management; evaluating and purchasing a business; developing a basic business plan; franchising options; e-commerce marketing strategies; financial management; HR management; and leadership. The main emphasis will be on new venture development and management.

Course Objectives:

1. To acquire in-depth understanding towards Entrepreneurship as an area of study.
2. To instill the spirit of entrepreneurship and imbibe an entrepreneurial mind-set.
3. To provide an overview of the competencies needed to become an entrepreneur and to provide students an opportunity to assess their strengths and identify the gaps to become successful entrepreneurs.
4. To familiarize the students with various entrepreneurial options, the process of establishing a start-up and launching a new venture.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
302.1	Remember	STATE various concepts, models and theories of Startup and New Venture Management.
302.2	Understand	DISCUSS various aspects of Start-Ups like training, growth and entrepreneurial failures.
302.3	Apply	DEMONSTRATE the role of various government and financial institutions involved in Startup and New Venture Management.
302.4	Analyze	RELATE the roles of various institutions involved in Startup and new venture development at district, state and national level.
302.5	Evaluate	APPRAISE the given business model and make financial projections based on it.
302.6	Create	DESIGN a business plan for an innovative startup idea.

Course Contents:

Unit 1: Concept and Definitions

Entrepreneur and Entrepreneurship and Economic development: A Typology of Entrepreneurs, The Entrepreneur's role, Task and personality, Entrepreneurial skills: creativity, problem solving, decision making, communication, leadership quality, McClelland's N-Ach Theory, self-analysis, personal efficacy, culture and values, risk-taking behavior, technology backup.

Unit 2: Evaluating Entrepreneurial Options and Startup Opportunities

Understanding the idea and an opportunity, the opportunity creating, shaping, recognizing and seizing, screening venture opportunities, gathering information and analyzing, evaluating venture opportunities and develop startup strategy, feasibility analysis and risk-taking ability.

Unit 3: Understanding Startup Finances, Capital and Other Requirements

An overview of startup finance and sources of finance, understanding the business model and financial projections-how to forecast expenses and revenue, gathering the resources, developing entrepreneurial marketing and operational plan, role of government institutions.

Unit 4: Developing Team and Presenting Business Plan

The importance of team, forming and building team, examining sample business plans and writing business plan, understanding the investor's perspective and presenting the business plan, valuation of business plan and the elevator pitch.

Unit 5: Launching and Managing the New Venture

Legal issue and other formalities, Legal form of new venture, Entrepreneurial challenges as an individual and as an entrepreneur, both. Skills of managing business risk enhancing success.

Prescribed books:

1. Holt H. David (2005), Entrepreneurship New Venture Creation, Prentice-Hall.
2. Histrich D. Robert and Peters P. Michal Shepherd A Dean (2007), Entrepreneurship, McGraw Hill.

References books:

1. Kuratko F. Donald and Hornsby S. Jeffery (2009), New Ventures Management, Entrepreneur Road Map, Pearson Education.
2. Kuratko F. Donald and Hornsby S. Jeffery (2009): New Ventures Management, Entrepreneur Road Map, and Pearson Education.
3. Stutely, R. (2002): The Definitive Business Plan, FT Prentice Hall.
4. O'Rourke S. James (2009): Writing and presenting business plan, Cengage Learning.
5. Stevenson, H.H., Grousebeck, H.I., Roberts, M.J. and Bhide, A. (2000): New Business Ventures and the Entrepreneur, McGraw-Hill, Singapore.

MARKETING MANAGEMENT SPECIALIZATION

PSO-1: Demonstrate the Proficiency in Marketing Management domain like Strategy Formulation, Sales and Distribution, Consumer Behaviour, Digital Marketing, Marketing Communication, Marketing Research to optimally solve the business problems.

PSO-2: To inculcate the ability to gain multidisciplinary knowledge through case analysis, projects-based Learnings and Internships, Industrial Visits, Corporate Sessions to support the Marketing Function.

COURSE CODE	MB303A
COURSE TITLE	SALES AND DISTRIBUTION MANAGEMENT
COURSE CREDITS	3

Course Description :

Economic growth can only be increased and sustained if manufacturers, distributors and the service industries are able to sell and distribute their products profitably to the widest possible markets. Selling, Sales and Distribution Management are therefore essential functions without which economic growth cannot take place.

Course Objectives:

1. To introduce course participants to national and international sales and distribution practices.
2. To expose course participants to the tools and strategies necessary for designing, motivating and evaluating sales and distribution management systems.
3. To sharpen decision making skills of future sales and distribution managers.
4. To develop understanding and appreciation of the Sales and Distribution processes in organizations.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
303A.1	Remember	DEFINE concepts, theories and terms in sales and distribution management.
303A.2	Understand	DISCUSS sales techniques used by the organizations for business maximization.
303A.3	Apply	DEMONSTRATE sales force management strategies used for designing and organizing sales force.
303A.4	Analyze	RELATE the impact of cultural factors on a firm's sales performance.
303A.5	Evaluate	APPRAISE distribution strategy and take corrective action if necessary.
303A.6	Create	DESIGN sales force & channel management strategies for an organization.

Course Contents:

Unit 1: Introduction to Sales Management

Marketing vs. Sales, Sales Strategies.

Unit 2: Sales Techniques

Personal selling process, Consumer and organizational buyer behaviour, Sales responsibilities and preparation, Key Account management, Customer Relationship Management.

Unit 3: Sales force Management

Designing and organizing the sales force, Recruiting and selecting right salespeople, Training, motivating and developing the salesforce.

Unit 4: Sales environment

Cultural factors that effect a Firm's sales performance, International Selling, Selling of financial services, B 2 C selling Vs. B 2 B selling.

Unit 5: Distribution Management

Marketing Logistics, Distribution role and functions of Channels, Channel Design Decisions, Channel Selection Criteria and Issues, Channel Management and Conflict Management.

Prescribed Books:

1. Sales and Distribution Management – Text and Cases By: Krishna K. Havaldar and Vasant M. Cavale, TATA McGraw-Hill.

Suggested Readings:

1. Selling and Sales Management; David Jobber and Geoff Lancaster: Pearson Education.
2. Sales Management-Shaping future sales leaders; John F. Tanner Jr, Earl D. Honeycutt Jr., and Robert C. Erffmeyer; Pearson Education.

GBS RC MBA Syllabus

COURSE CODE	MB304A
COURSE TITLE	DIGITAL MARKETING
COURSE CREDITS	3

Course Description:

With the rapid shift of advertising dollars away from traditional media to online platforms, it is becoming increasingly important for marketing graduates to be well-versed in digital marketing and analytics fundamentals.

This course has been designed for those who want to understand the key elements of building an effective digital marketing campaign. Covering best practice and using case studies throughout, the session offers a practical guide to the core techniques in digital marketing. Online tools and reference materials are highlighted throughout, enabling delegates to leave with solid hands-on knowledge that they can implement immediately upon return to the office

Course Objectives:

1. To provide students with the technical foundation and digital literacy necessary to market goods and services on the internet.
2. To learn best practices for social media marketing using appropriate skills.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
304A.1	Remember	DEFINE core concepts, models and key terms of Digital Marketing.
304A.2	Understand	DESCRIBE the tools, concepts, function of Mobile E-Commerce in Digital Marketing.
304A.3	Apply	MAKE USE OF digital marketing tools in devising strategies for online branding.
304A.4	Analyze	RELATE the impact of web traffic on consumer engagement and conversion through Web Analytics.
304A.5	Evaluate	SELECT appropriate digital marketing tools and techniques for visibility of an organization.
304A.6	Create	DESIGN a Digital Marketing plan for Business maximization.

Course Contents:

Unit 1: Digital marketing Fundamentals

Understanding the concepts of digital marketing, internet, WWW, traditional marketing vs digital marketing, Introduction to e-commerce: Business models, Business Models on the Web. Public policy: social, legal, ethical, political issues for e-commerce.

Unit 2: Mobile e-commerce

Retailing (e-tailing), Services online: Online content and digital media, B2B e-commerce, Global opportunities and issues.

Unit 3: Scope of Digital Marketing and Web Planning

Know your customers - Buyer behavior, segmentation, targeting, web design and planning, types of websites, Planning of website, Overview, the website, branding, banner ads, affiliate marketing.

Paid search, Characteristics of E Marketing: Addressability, Interactivity, Accessibility, Connectivity, Control, Mapping of digital marketing media.

Unit 4: Tools of Digital Marketing

Email Marketing-Introduction to email marketing, challenges faced in bulk emails, types of email marketing.

SEO: Introduction to concept search engine optimization (SEO), comparison shopping engines. Email, RSS, podcasting, Blogs, Viral, Wikis, CRM. Auctions, Portals.

Online Branding: Search Engine Marketing, Online Communities and Innovation Communities, Mass Collaboration and Crowd-sourcing, Social networks, Value Creation through Social Networking.

Unit 5: Web Analytics and Social Media Marketing

Introduction, understanding account structure, cookie tracking, monitoring traffic, Understanding Digital Analytics, Acquisition, Engagement and Conversion, Measuring Social Impact, Multi-Touch Analytics, Mobile Analytics, and The Future of Digital Analytics: Big Data.

Text Books:

1. Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation by Damian Ryan, Calvin Jone. Kogan Page.
2. Marketing 2012 by William M. Pride, O. C. Ferrell, Cengage Learning.
3. Integrated Marketing Communications: Asia Pacific Edition by William Chitty, Nigel Barker, Michael Valos, Terence A. Shim, Cengage Learning.
4. DigiMarketing: The Essential Guide to New Media and Digital Marketing by Kent Wertime, Ian Fenwick.

GBS RC MBA Syllabus

COURSE CODE	MB305A
COURSE TITLE	PRODUCT AND BRAND MANAGEMENT
COURSE CREDITS	3

Course Description:

Product and Brand Managers are the lifeblood of many of the world's most successful companies. They provide their companies with significant competitive advantage. Generally they are responsible for the development and introduction of new products, including pricing, promoting and distributing products. They also manage old, new and derivative products (product extensions); determine when old products die and how to position their products against the competition.

Course Objectives:

1. To learn fundamentals of Product and Brand Management.
2. To make participants understand competition at product level as well as brand level. Two broadly important aspects namely Product Management from competition point of view and Product Management from New Product Development and Innovation point of view are to be covered.
3. To make students understand principles of Branding, role of brands, elements and components of brands, brand equity etc. The main aim for Brand Management is to make sure that students understand implications of planning, implementing and evaluating Branding Strategies.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
305A.1	Remember	DEFINE various concepts, theories and models in product and brand management.
305A.2	Understand	DESCRIBE characteristics and strategies required at each step of product life cycle.
305A.3	Apply	MAKE USE OF marketing skills and knowledge of various aspects of marketing for product and brand management.
305A.4	Analyze	RELATE brand positioning, brand leveraging, and brand performance for brand building.
305A.5	Evaluate	APPRAISE branding strategies used to build brand equity.
305A.6	Create	DESIGN appropriate branding strategies for product or service.

Course Contents:

Unit 1: Product Management

Product Development, Product focused organization; Market focused organization, Factors influencing design of the product, Changes affecting product management.

Developing Product Strategy

Setting objectives and alternatives, Product strategy over the life-cycle, Customer analysis, Competitor analysis, Design of manufacture, New product development.

Unit 2: Brands and Brands Management

Commodities Vs Brands, The role of brands, Branding Challenges and opportunities, The Brand

equity concept, Building a strong Brand, Sources of brand equity: Brand Awareness and Brand Image.

Unit 3: Brand Positioning and Brand Building

Brand knowledge, Brand portfolios and market segmentation, Identifying and establishing brand positioning, Defining and establishing brand values, Steps of brand building: Choosing Brand elements, Designing marketing programs to build brand equity, Integrated Marketing Communications.

Unit 4: Brand Leveraging and Brand Performance

Leveraging secondary brand associations, Co-branding, Celebrity endorsement, Establishing brand equity management system, Measuring sources of brand equity and consumer mindset.

Unit 5: Designing and Sustaining Branding Strategies

Brand hierarchy, Designing a Branding strategy, Brand extension and brand transfer, Managing brand overtime, Using cause related marketing to build brand equity.

Measuring and Managing brand equity

Brand Value chain and Brand Audits, Brand Tracking, Brand Valuation, Brand Equity Models – Brand Asset Valuation, Aaker Model, BRANDZ, Brand Resonance, Reinforcement, Revitalization, Crisis.

Prescribed Books:

1. Strategic Brand Management By Kevin Lane Keller, M.G. Parameswaran and Issac Jacob, 3rd edition, Pearson education.
2. Product management - Donal R. Lehmann, Russel S. Winer.

Suggested Readings:

1. Branding Concepts and Process - Debashish Pati.
2. Marketing Management - Philip Kotler.
3. Successful Branding - Pran K Choudhary.
4. Brand Positioning Strategies for Competitive Advantage - Subrato Sen Gupta.
5. Strategic Brand Management – Capere.
6. Behind Powerful Brands – Jones.

COURSE CODE	MB306A
COURSE TITLE	CONSUMER BEHAVIOUR
COURSE CREDITS	3

Course Description:

Focus of the course would be on the psychological and sociological elements and their impact on consumer decision making. The course will help the students take a holistic view of the buyer; it will help equip them with knowledge of various models and frameworks to help understand buyer behavior and align the knowledge with formulation of appropriate marketing strategies. The objective is to gain an understanding of the theoretical and conceptual concepts of buyer behavior and apply them to real life marketing situations and practices.

Course Objectives:

1. To identify and explain factors which influence consumer behavior and display critical thinking and problem solving skills.
2. To help students understand different models of consumer decision making.
3. To gain, evaluate and synthesize information and existing knowledge from a number of sources and experiences.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
306A.1	Remember	DEFINE the nature of consumer behavior and various practices and theories linked to the study of consumer psychology.
306A.2	Understand	DESCRIBE the critical and reflexive actions of consumers in connection with consumption patterns and culture.
306A.3	Apply	DEMONSTRATE how the knowledge of different facets (Personality, Attitude and Perception) of consumer behavior can be applied in developing various marketing strategies.
306A.4	Analyze	OUTLINE and synthesize the information & knowledge gained from various sources and experiences with respect to consumer behavior.
306A.5	Evaluate	CHECK the appropriateness of marketing strategies designed on the basis of consumer behavior studies related to specific situations.
306A.6	Create	DESIGN (Segmentation, Targeting and Positioning) strategy based on consumer insights.

Course Outline:

Unit 1: Introduction to Consumer Behavior

Introduction of marketing strategy and consumer behavior, Market Analysis. Consumer Behavior, its Origin and Strategic Applications. Consumer Needs and Motivation: Types and Systems of needs, Motivation dynamic.

Unit 2: Culture and Consumer behavior

Meaning of culture, Characteristics of culture, function of culture, types of culture, Cross-cultural consumer analysis:- cross cultural marketing objectives, Basic areas for cross-cultural marketing, problem in cross cultural marketing. Motivation and consumer behavior: - Introduction, motives and motivation, positive or negative motivation, Consumer motives:- personal, social motives.

Unit 3: Personality and Consumer Behavior

Theories of Personality, Personality and Understanding Consumer Behavior, Brand Personality, Self and Self Image, Virtual Personality for Self. Consumer Perception: Sensory Dynamics of Perception, Elements of Perception, Consumer Imagery. Consumer Learning: The elements of consumer learning, Behavioral learning. Consumer Attitude Formation and Change, structural models of attitudes, attitude formation, Communications and Consumer Behavior.

Unit 4: Attitude and consumer behavior

Meaning of attitude, nature and characteristics of attitude, types of attitude, learning of attitude, sources of influence on attitude formation, Model of attitude- Tri-component attitude model, multi-attribute attitude model.

Unit 5: Marketing ethics and Social Responsibility

Exploitative targeting, manipulating consumers, and social responsibility.

Prescribed Books:

1. Consumer Behavior by Leon G. Schiffman, Joseph Wisenblit & S. Ramesh Kumar, Tenth Edition. Pearson, India.
2. Consumer behavior & marketing strategy, J. Paul Peter, Jerry C. Olson, Seventh Edition, India.

Suggested Readings:

1. Consumer Behavior – Hawkins, Best, Coney.
2. Customer Behavior – A Managerial Perspective – Sheth, Mittal – Thomson.
3. Conceptual Issues In Consumer Behavior Indian Context – S Ramesh Kumar-Pearson.

COURSE CODE	MB307A
COURSE TITLE	INTEGRATED MARKETING COMMUNICATIONS
COURSE CREDITS	3

Course Description:

Integrated Marketing communication is part and parcel of marketing which is the backbone of any organization. It has huge potential as a career opportunity because without media no organization can survive in this competitive environment.

Course Objectives:

1. To make the students familiar with different concepts and practices of marketing communication.
2. To learn various tools of marketing communication and its counterparts.
3. To gain knowledge about the W's to use media (when, why, where, what).
4. To learn to make effective media plan.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
307A.1	Remember	DEFINE the major role of IMC process, IMC Tools, and Elements of IMC.
307A.2	Understand	EXPLAIN various tools of IMC and marketing research.
307A.3	Apply	EXECUTE the creative strategy for copy platform, campaign planning, appeals & media planning.
307A.4	Analyze	RELATE the effectiveness of various media platforms with respect to media planning.
307A.5	Evaluate	MONITOR the implementation of Marketing Research, Ethics & Social responsibility in IMC campaign.
307A.6	Create	CONSTRUCT an Integrated Marketing Communication plan for implementation of effective promotional mix strategy.

Course Outline:

Unit 1: An Introduction to IMC

Role of IMC in Marketing process, IMC program situation Analysis, Introduction to IMC tools (Advertising, sales promotion, publicity, personal selling, Direct marketing, Event Management, E-commerce, Corporate communication, Public Relations, Media Relations, Industrial Relations, Government relations, Trade fair and exhibitions, crisis management), Elements of IMC.

Unit 2: Message design & Communication in IMC

Perspectives on consumer behavior, Advertising – features & Objectives, Organization structure & classification of ad agencies, Source and message factors, Measurement of ad effectiveness (DAGMAR) model, AIDA model, Establishing and allocating budget for promotional program.

Unit 3: Creative strategy planning, development and execution

Creative process, Copy platform & Campaign planning, Appeals and execution styles, Media planning & strategy.

Unit 4: Understanding different media

Broadcast media and print media, Sales promotion-consumer oriented sales promotion techniques, trade oriented sales promotion ,Personal selling-Role of Direct marketing in IMC, Customer Relationship management, Public relations- Functions of PR department, Importance of sponsorship programs, event marketing, Internet marketing- Meaning, objectives & benefits of internet marketing.

Unit 5: Marketing research, ethics and its applications

Definition, Implementation of Market research in IMC, Application of market research, Ethics and social responsibility in IMC campaigns.

Prescribed Books:

1. Advertising and Promotion: An Integrated marketing communications perspective By George E. Belch and Michael A. Belch, TATA McGraw Hill.

Suggested Readings:

1. Advertising Management – Batra, Myers, Aaker.
2. Principals of Marketing – Philip Kotler, 12th Ed.
3. Integrated Advertising, Promotion &Marketing Communication – Clow, Baack (2nd Ed).

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COURSE CODE	MB308A
COURSE TITLE	MARKETING RESEARCH
COURSE CREDITS	3

Course Description:

The course is designed to help students develop their research, inquiry and communication skills while providing a road map to their future career in Marketing. Emphasis is placed on the practical issues related to decision maker's use of marketing information. Marketing research provides the student with substantial experience in developing critical analysis and statistics skills.

Course Objectives:

1. Analyze the roles, the functions and the processes that surround marketing research, emphasizing the specification, collection and analysis of primary data.
2. Examine the research process, problem definition, alternative research designs, qualitative methods, survey methods, experiments, measurement & questionnaire design, data collection and foundational techniques for data analysis, as well as hands-on experience with computer application for data analysis.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
308A.1	Remember	DEFINE basic marketing information needs and research methods used in solving essential business problems and challenges.
308A.2	Understand	EXPLAIN the types of research, research design process and its application in the field of marketing.
308A.3	Apply	SCHEDULE an appropriate research design to carry a market research.
308A.4	Analyze	EXAMINE the data collected for drawing inferences from market research studies.
308A.5	Evaluate	JUDGE a questionnaire on the basis of reliability and validity with proper justification to address a real life marketing research problem.
308A.6	Create	FORMULATE a marketing research plan for a given business problem.

Course Outline:

Unit 1: Introduction to Marketing Research:

Definition of Marketing Research, Marketing research process, Role of Marketing research in Decision making, defining the problem- Importance, Process, Tasks involved, Management decision problem & Marketing research problem, Ethics in marketing research.

Unit 2: Research Design

Types of Research Designs – Exploratory, Descriptive & Causal, Formulating hypotheses using

exploratory research techniques like literature survey, experience survey & analysis of cases, Meaning of Qualitative research & applications of Depth Interviews & Focus Groups in marketing Applications of longitudinal studies in consumer panels, retail shop audit, media audience tracking studies like TRP, brand tracking studies. Descriptive research design, causal research design, Applications related to Test Marketing.

Unit 3: Data collection – Questionnaires, Scaling & Sampling

Designing questionnaires & observation forms for different marketing research situations, Scale Construction, Scale Purification Process, Reliability Testing using Chronbach Alpha, Validity Testing , Applications of Likert, Semantic Differential & Staple Scales for positioning research, brand research, attitudinal studies, customer satisfaction research, sampling unit, sampling element, choice of sampling frame, determining sample size for probability & non-probability sampling methods & choice of final sample by using appropriate sampling methods in a step by step manner.

Unit 4: Data Analysis

Testing hypothesis for one mean, two means, two proportions, Chi Square Test, ANOVA – One & Two way, Conjoint Analysis, Factor Analysis, applications in consumer behavior studies Cluster Analysis, Multi- dimensional Scaling & Perceptual Mapping, Discriminant Analysis.

Unit 5: Applications & Recent Trends in Marketing Research

Introduction, Consumer Market Research, Business-to-Business Market Research, Product Research, Pricing Research, Advertising Research, Media research, Sales Analysis and Forecasting, Data Mining, Recent Trends in Marketing Research-online marketing research, Retail, social marketing, brand equity, services marketing.

Prescribed Books:

Marketing Research - An Applied Orientation by Malhotra and Dash, Pearson Education.

Suggested Readings:

1. Marketing Research, Zikmund, Babin, Cengage Learning Marketing Research by Boyd, H.P., R. Westfall and S. F. Stasch., Delhi: A.I.T.B.S., 7th Edition.
2. Marketing Research by Burns, G.A. and D. Bush, South Western: Cengage, 9th Edition.

COURSE CODE	MB309A
COURSE TITLE	RURAL MARKETING
COURSE CREDITS	3

Course Description:

Business-to-business (B2B) refers to a situation where one business makes commercial transaction with another. This Course typically covers how a business is sourcing materials for their production process.

Course Objectives:

1. The course aims to familiarize the students with the basic concepts of Rural Marketing, the nature of the Rural Consumer, and marketing of agricultural inputs and produce.
2. To prepare the young graduate for the task of Rural Marketing Research and to undertake the Self-employment linked with Rural Marketing Management.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
309A.1	Remember	DEFINE various theories, concepts and models related to Rural Marketing.
309A.2	Understand	DESCRIBE Indian Rural Ecosystem & issues of Rural Marketing.
309A.3	Apply	MAKE USE OF knowledge, concepts and tools necessary to understand the Agricultural Marketing Channels.
309A.4	Analyze	EXAMINE the issues related to Rural Marketing.
309A.5	Evaluate	APPRAISE new product development for Rural Marketing with respect to rural market product lifecycle.
309A.6	Create	DESIGN Rural Marketing Mix for a given product.

Course Outline:

Unit 1: Introduction to Rural Marketing

Introduction: Meaning – Evolution – Nature and Characteristics of Rural Market -Understanding the Indian Rural Economy -Rural Marketing Models – Rural Marketing Vs Urban Marketing – Parameters differentiating Urban and Rural Market – Differences in consumer behavior in Rural and Urban market.

Unit 2: Agricultural Marketing

Concept and Nature of Agricultural Marketing, Types of Agricultural Produce, Concepts and types of Agricultural Markets, Marketing channels, Methods of Sales.

Unit 3: Rural Marketing Mix

Rural Marketing Mix: Rural Marketing Mix – Additional Ps in Rural Marketing – 4As of Rural Marketing Mix – New Product Development for Rural Market – Rural Market Product Life Cycle

– Objectives behind new product launch – New Product development process.

Unit 4: Brand and Channel Management

Rural Market Brand and Channel Management: Brand Loyalty in Rural Market – Regional Brands Vs National Brands – Channel Management – Indian Rural Retail Market – Rural Retail Channel Management – Strategies of Rural Retail Channel Management.

Unit 5: Issues in Rural Marketing

Rural consumer behavior-Feature- Factors influencing consumer behavior-Lifestyle of rural consumer –FMCG sector in rural India- Challenges faced by rural marketer- The role of advertising in Rural Marketing.

Prescribed Books:

1. Rural Marketing – Pradeep Kashyap, 3e Pearson Education, 2016.
2. Rural Marketing –C. S. G. Krishnamacharyulu, Lalitha Ramakrishnan, Text and Cases, Pearson Education, 2009.

Suggested Readings:

1. Rural Marketing, Environment, problems and strategies – TP Gopaldaswamy, 3e Vikas 1. Publications, 2016.

GBSRC MBA Syllabus

AGRI BUSINESS MANAGEMENT SPECIALIZATION

PSO-1: Acquire the excellence in Agribusiness Management sector through Post-Harvest Technology, Agri Engineering, Hi-Tech Agriculture, Landscaping, Marketing of Agri Input and Output, Agri Import and Export, Livestock Management, Procurement, Agri Finance and Agri Cooperatives to make Agribusiness more simple and to solve the business and managerial issues.

PSO-2: To inculcate the ability to gain multidisciplinary and multi-level knowledge through specialization case analysis, projects-based Learnings, Internships, Industrial Visits, Corporate guest Sessions to support the Agribusiness Management sector.

COURSE CODE	MB303B
COURSE TITLE	CURRENT TRENDS IN AGRI BUSINESS MANAGEMENT
COURSE CREDITS	3

Course Description:

Course introduce the student regarding current and upcoming trends in agri business sector, factors of production, good agricultural practices that will help the nation to become self-dependent. Course will give more focus on modern agricultural practices implementation at grass root level.

Course Objectives:

1. To understand current trends in agriculture, horticulture, floriculture in terms of administration, business planning, marketing.
2. To introduce about latest technologies adapted by successful farmers and agro industries in terms of post-harvest management, use of IT in Agriculture.
3. To understand modern practices used in agribusiness today.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
303B.1	Remember	STATE various basic concepts related to agro industries, modern and traditional methods of agriculture.
303B.2	Understand	RECOGNISE emerging trends in Agribusiness Management .
303B.3	Apply	Effectively USE the Management of New Technology in Agribusiness.
303B.4	Analyze	RELATE current trends and best practices in Agribusiness Management.
303B.5	Evaluate	ASSESS the importance of Information Technology in Agribusiness Management.
303B.6	Create	DEVELOP the business plan for Agribusiness with current trends in Agri-allied Sectors.

Course Outline:

Unit 1: Introduction to Agro based industries

Types of agro-based industries and Agri Export Zones, Institutional preparation for the adaption of new technologies, Role of Agro Industries in development of country, Difference between traditional and modern technologies in agriculture.

Unit 2: Emerging Trends in Agribusiness Management

Agriprenueurship, Sustainable Farming, Post-Harvest Equipments, Landscape design softwares, Food Processing Technologies, Use of IT in Agri Business.

Unit 3: Management of New Technology in Agri Business

Marketing reforms in agri business, Management of Digital Marketing, Management of Resistance to Change, Comparative analysis of modern techniques and anticipation of future trends, SWOT analysis of current trends in Agri Business Management.

Unit 4: Use of IT in agri business management

Meaning, Role and importance of IT in Agribusiness and Agriculture, Robotics in dairy industry, Use of IT tools in Sales and Marketing, Use of drone in farming, IoT in Agri sector.

Unit 5: Current trend in Agri allied Sectors

Modern trends in Seed Sector, Current practices in animal husbandry sector, Pesticide formulations, fertilizer formulations (numerical), Business plan preparation and presentation for agri business, Gathering the current resources to manage good production.

Prescribed Books:

1. “Agri Business Management Problems and Prospects” By Prof. R K Dixit and Dr Himanshu, Ritu Publications, Jaipur.
2. “Agri Business Management”, Dr K P Sinha, A K Publications.
3. “Introduction to Agricultural Economics and Agri Business Management”, by J M Talathi, V G Naik & V N Jalgaonkar, Ane Books India.
4. “Agri Business Management”, Dr. J S Amarnath and Dr. A P V Samvel, Salish Serial Publishing House.

Suggested Readings:

1. “Indian Agriculture and Agri Business Management”, Dr, Smita Diwase, Krishi Resource Management Network.
2. “Innovation in Agri Business Management”, Karnam Lokanadhan, K Mani and K Mahendran, NewIndian Publishing Agency.

COURSE CODE	MB304B
COURSE TITLE	LIVESTOCK MANAGEMENT AND FODDER TECHNOLOGY
COURSE CREDITS	3

Course Description:

Course introduces various practices involved in animal husbandry. Students will get information about various breeds, their suitability, potential in various climatic zones. Students will also get information about fodder of animals and different fodder processing technologies including information of current trends in such industries.

Course Objectives:

1. To know about livestock management in India.
2. Laws and rules related to livestock management.
3. To know about fodder technologies and to find opportunities related to entrepreneurship in livestock management sector.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
304B.1	Remember	STATE the concepts, importance and various applications in Livestock Management.
304B.2	Understand	DESCRIBE processing and marketing of Livestock.
304B.3	Apply	USE of Livestock Product Preservation and Marketing techniques.
304B.4	Analyze	RELATE the Financial Aspects of Livestock Management and Fodder Technology.
304B.5	Evaluate	SUPPORT the current trends in preservation of Fodder and its resemblance for good market value.
304B.6	Create	CONSTRUCT the process of fodder preservation techniques, nutritional requirement of livestock, marketing of fodder and livestock products.

Course Outline:

Unit 1: Introduction to Livestock Management

Meaning, concept, importance of livestock management, Potential of livestock management in India, Various breeds and their resembles in animal sector, Use of livestock for dairy, meat purpose, Livestock Industrial analysis.

Unit 2: Livestock Management

Purchase and maintenance of livestock, Vaccinations for livestock, B:C ratio of livestock, Different cattle shed design and construction of milk parlor, Economic development of country through livestock development.

Unit 3: Processing & Marketing of Livestock

Identification of livestock for benefit, Product identification and finalization of livestock, Management of cow, buffalo, sheep & goat, poultry, other animals, Livestock product preservation techniques and marketing, SWOT analysis of marketing of livestock product.

Unit 4: Financial Aspects of Livestock and Fodder

Financial projections for animal industry, Sources of finance for livestock and fodder, Preparation of financial documents for control over budget, Agencies involved in financing and insurance of livestock, Economic growth of farmers and agro industries.

Unit 5: Fodder Technology Management

Various types of fodder, Preservation of fodder for good market value, Preservation, processing and marketing of animal fodder, Current trends in preservation of fodder, Parameters to decide fodder and micronutrient calculations

Prescribed Books:

1. “Handbook of Livestock Management” by Richard A. Battaglia, Pearson publication.
2. “Livestock Production Management” by Nilotpal Ghosh, PHI LEARNING PVT. LTD. New Delhi.
3. “Fodder Production and Grassland Management” by Reddy D V, Oxford & IBH publication.
4. “Grassland Dynamics: An Ecosystem Simulation Model” by cabi, CABI.

Suggested Readings:

1. “Principles of Animal Nutrition and Feed Technology” By Reddy D.V. Oxford & IBH Publishing house.
2. “ A Text book of Animal Husbandry” by Banerjee G.C., Oxford publication.

COURSE CODE	MB305B
COURSE TITLE	MANAGEMENT OF AGRICULTURAL ENGINEERING BUSINESS
COURSE CREDITS	3

Course Description:

Concept of Agricultural Engineering, Farm Structure, Farm Power and Farm Machineries. Introduction to new technologies in green house construction, Farm Pond Construction, Levelling, bunding, Landscaping. Students will get knowledge about mechanization of farm, management of agricultural equipment etc.

Course Objectives:

1. To explain the concept of Agricultural Engineering, Food Processing Equipments, Post-Harvest equipments, packaging machines.
2. To orient Students about engineering in landscape construction, Financing for equipments, Opportunities for agri engineering in entrepreneurship.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
305B.1	Remember	STATE the concept, scope, objectives, elements of Agricultural Engineering Business
305B.2	Understand	DESCRIBE the Farm Structure, power tools and machineries in effective Management of Agricultural Engineering Business.
305B.3	Apply	MAKE USE OF Engineering tools for Landscaping and Bunding.
305B.4	Analyze	RELATE current practices in procurement with the use of Engineering (tools, machineries etc.).
305B.5	Evaluate	CRITIQUE current practices in Agri Engineering Business with value added design of machinery products.
305B.6	Create	CONSTRUCT the project proposal planning by using Government Interventions in Engineering tools.

Course Outline:

Unit 1: Introduction to Agricultural Engineering

Meaning, Concept, Importance and Scope, Objectives, Indian Agri Business Sector Scenario, Agricultural Engineering elements.

Unit 2: Farm Structure, Power and Machineries

Farm Power tools, Basic mechanism of Engine, Cropping pattern and mechanization in Indian Agriculture, Introduction to different equipments used for cultivation, harvesting and processing of cereals, pulses, legumes, fruits and vegetables, International standards for operating machines.

Unit 3: Landscaping and Bunding

Engineering for landscaping, Engineering tools used in irrigation (Sprinkler, Drip, Micro Irrigation), Management of maintenance of these equipments, record keeping, financing institution, Contour Bunding opportunities, Soil management.

Unit 4: Linking Engineering to Procurement, Distribution and Transport

Current practices in procurement, Use of Engineering in procurement, use of machineries in distribution, Transport reforms in agri sector, agricultural engineering towards transport.

Unit 5: Government Interventions in Engineering Tools

SWOT analysis of engineering practices, resistance to change, adaptation of new technology, Government subsidies on purchase of high value equipment, project proposal planning.

Prescribed Books:

1. Agribusiness Management: Theory and Practical, Bairwa Shoji Lal Et.Al Write & Print Publications.
2. Elements of Agricultural Engineering, Jagdishwar Sahay, Standard Publishers.
3. Principal of Agricultural Engg. Vol –I, T P & A M Michael Ojha, Jain Brothers.
4. Unit Operations of Agricultural Processing, K.M. Sahay, Vikas Publishing House Pvt Ltd.

Suggested Readings:

1. A Textbook of Machine Drawing, P.S. Gill, S.K. Kataria & Sons.
2. Modern Techniques of Raising Field Crops Second Edition, SINGH C., OXFORD & IBH PUBLISHING.

GBSRC MBT Syllabus

COURSE CODE	MB306B
COURSE TITLE	MARKETING OF AGRI- INPUTS AND OUTPUTS
COURSE CREDITS	3

Course Description:

Course introduce the student regarding rural market environment, marketing of Agri inputs, outputs strategies for the developments of rural markets and the problems face by farmers. The course would also give better understanding of marketing of Inputsand Outputs to student.

Course Objectives:

1. To understand in-depth rural market environment and learn about rural marketing opportunities available for agri inputs and outputs.
2. To specify categories of inputsand outputs in agricultural marketing and to understand rural consumer.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
306B.1	Remember	STATE the concept, scope, objectives, elements of Marketing of Agri Inputs and Outputs
306B.2	Understand	DESCRIBE different agricultural inputs, policies and problems faced by farmers
306B.3	Apply	EXPLORE opportunities and challenges in the marketing of various Agricultural inputs like pesticides, fertilizers etc.
306B.4	Analyze	RELATE strategies for rural marketing and promotion of agri products.
306B.5	Evaluate	CRITIQUE on rural market environment and improvement with reference to marketing of agri-inputs and outputs.
306B.6	Create	DESIGN a promotion plan of agri inputs to solve the rural marketing problems.

Course Contents:

Unit 1: Rural market environment and improvement

Classification of rural markets. Occupation pattern and income generation, location of rural population, Literacy level, land distribution pattern, irrigation facilities and infrastructural facilities, Rural credit institutions, rural retail outlets, print media in rural areas, Demand and supply pattern, problems in rural marketing, rural consumer behavior, Measures to improve the agricultural marketing, regulated markets-their functions, objectives and advantages, Model Act-2003 for Agri marketing, Measures to remove deficiencies in regulated market, grading and use of IT in Agricultural, Marketing, future trading (commodity exchanges), input-profitability analysis, Study of market intelligence and market integration: Meaning, definition, types of market integration, market function, price trends, market information, co-operative agricultural marketing and public agencies involved in agricultural marketing viz. FCI, NAFED, STC etc. functions of price mechanism, interrelationship between prices of inputs and output. Nature and supply of agricultural products, marketable and marketed surplus, Types and reasons for movements and

their effect in agricultural price stabilization and price support policies. Hedging: Meaning and features of hedging, kinds, purpose, benefits and limitations of Hedging. Future trading: Characteristics of future trading, organized trade in futures.

Unit 2: Marketing of Agri Inputs and Outputs

Marketing of agri inputs such as seeds, fertilizers, bio-fertilizers, pesticides. Bio-pesticides, tractors and farm implements, fertilizer and pesticide control order, Government policy in pricing/price commission and marketing of agro inputs, credit facilities, distribution channels, trade practices and availability of financial institutions, Problems faced by Indian farmers in input marketing.

Unit 3: Strategies for rural marketing and Promotion of Agri Products

Strategic view, co-operatives, interdependence of inputs to rural marketing, management of demand and supply, Unique selling propositions, ethics in business, Developing sales force in rural markets, agricultural marketing agencies at village, block and district levels, Basic concept of promotion, Fundamental of advertising, Market Analysis for Agri products segmentation and targeting, Sales management, personal selling and salesmanship, Sales related marketing policies.

Unit 4: Promotion of Agri inputs

Basic concept of promotion, Fundamental of advertising, Market Analysis for Agri products segmentation and targeting, Sales management, personal selling and salesmanship, Sales related marketing policies, Extension Education, Market Assessment, Classification of rural market.

Unit 5: Problems in Rural Marketing

Defects in traditional agri marketing system and suggestions for improvement, Channels of Marketing: Meaning, definition, marketing costs, margin, price spread, factors affecting the cost of marketing, reasons for higher marketing costs of farm commodities, ways of reducing market costs, Supply chain management in agro inputs, Concept of Agri supply chain, Advantages and Disadvantages and challenges of SCM in agriculture, Business processes, Infrastructure requirement, supply chain umbrella, Factors determining the nature of supply chain, Agribusiness supply chains in India, Success of supply chains, Case Studies, Drivers of supply chain performance, The role of transportation in a supply chain, factors affecting transportation decisions, tailored transportation, Managing supply, managing demand in supply chain.

Prescribed Books:

1. "Marketing of Agricultural Products", Richards L. Kohls and Joseph N UHL, Eastern Economy Edition.
2. Rural Agricultural Marketing, Prof. M V Kulkarni, Everest Publishing House.
3. Agri Food Marketing, D I Padberg, C Ritson and L M Albisu, CAB International.
4. Agricultural Marketing in India, S S Acharya and N L Agarwal, Oxford and IBH Publishing Co Pvt. Ltd.
5. Agriculture and Rural Development, Pratal May, Mohit Publications, New Delhi.
6. New Perspectives in Rural and Agri. Marketing, Ramkishen Y, Jaico Publishing House.
7. The Rural Marketing Book by Pradeep Kashyap and Siddhartha Raut.
8. Agri Marketing Management, Premjit Sharma, Gene Tech Book, New Delhi.
9. A text book of Rural Marketing by Minouti Kamat and R. Krishnamoorthy.
10. Rural marketing environment, problems and strategies by T.P. Gopalswamy.
11. Rural Marketing-Focus on agricultural inputs by Sukhpal Singh.
12. Indian Agriculture and agri-Business Management by Dr. Smita Diwase.

COURSE CODE	MB307B
COURSE TITLE	POST-HARVEST TECHNOLOGY AND MANAGEMENT
COURSE CREDITS	3

Course Description:

The course introduces the student regarding importance of Post-Harvest technology, various aspects of Agro processing Industry & innovation in Agro processing, packing to avoid the national loss due to lack of post-harvest knowledge.

Course Objectives:

1. To educate the students about importance of post-harvest technology management for achieving overall growth of agriculture sector.
2. To provide technical know-how and to develop managerial skills in order to serve the agriculture Industry efficiently.
3. Industrial study of Vegetables, Fruits, Milk, Meat, Fishery and Biodiesel sector with respect to various aspects.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
307B.1	Remember	STATE the concepts, theories of Post-Harvest Technology and Management.
307B.2	Understand	DESCRIBE Agro-Processing, Pre and Post-Harvest Management.
307B.3	Apply	USE appropriate Quality Control Management and Product Development in Agro-processing Sector.
307B.4	Analyze	EXAMINE various processing methods of post-harvest treatments and their outcomes.
307B.5	Evaluate	CRITIQUE on various Aspects in Agro processing industry.
307B.6	Create	FORMULATE a market study plan in Food Processing sector with inculcating required managerial aspects.

Course Contents:

Unit 1: Introduction to Agro processing, Pre & Post harvest management

Introduction to Indian agro-processing sector, SWOT analysis of agro-processing industries in India, Business Environment related to processed food industry, Importance of Pre-Harvest Management, Standard operation practices followed after harvesting the produce at farm level including handling, sorting, grading, post-harvest treatments, storage and transportation of fresh produce.

Unit 2: Aspects in Agro Processing Industry

Factors to be considered while establishing food processing plant including Government norms and requirements, Actual processing of Agri-produce into final products, Different preservation practices followed in food processing sector, Utilization of byproducts in agro processing industry.

Unit 3: Quality control management & Product development in in agro-processing sector

Importance of QCM in agro processing, Different quality certifications in agro-processing,

Introduction to the concept of New Product Development in a company, Need and importance of “New Product Development” in processed food industry, Steps required undertaking while going for a new product development, Introduction to functional and novel foods considering demographic, economic aspects of market.

Unit 4: Processed product packaging & labeling

Importance of packaging and labeling, Different kinds of packaging materials, Points to be considered while selecting a packaging material, Recent trends in packaging & labeling industry Viz. Green Packaging, Intelligent Labeling etc., government’s regulations in packaging and labeling of food products.

Unit 5: Managerial aspects & Market study in Food Processing Industry

Different department involved in a food processing company and importance of coordination in those departments etc. Importance of production, marketing & distribution aspects in food processing sector, Introduction to different research institutions and corporations involved in food processing sector, Case studies in agro- processing sector.

Prescribed Books:

1. S. N. Misra, 2004, “Commercial Agri-enterprises-Strategy Achievement and Future prospects”, Deep & Deep Publications, New Delhi.
2. F. C. Blank, 1999, “Handbook of Food and Nutrition”, Agro Botanical Publishers, India.
3. B. Misra, G. C. Kar, S. N. Misra, 2004,” Agro Industries and Economic Development, A vision of the 21st Century”, Deep & Deep Publications Pvt. Ltd., New Delhi.
4. Dairy Technology, By Sukumar De, Tata MC Graw Hills Publication, N Delhi.
5. Food biotechnology, S N Tripathy, Dominant Publishers and Distributors, New Delhi
6. State of Indian Farmer, A millennium Study, Post-Harvest Management, V R Gaikwad, Shreekant Sambrani, V Prakash, S D Kulkarni, P Murari, Academic Foundation, New Delhi.

COURSE CODE	MB308B
COURSE TITLE	AGRI IMPORT AND EXPORT MANAGEMENT
COURSE CREDITS	3

Course Description:

The Course introduces Import and Export of Agriculture commodities, how it will help to develop our economy, Institutional linkage of export promotion, rules and regulation for export and import. Information regarding the agencies involved in EXIM of Agri commodities also documentation require for export.

Course Objectives:

1. To understand the fundamentals of International Trading.
2. To orient Students about :
 - a. Potentials in international trade in Agri sectors.
 - b. Import and Export management of Agri commodities.
 - c. Agencies / Institutes/ Bodies for EXIM of Agri Commodities.
 - d. Relevant Acts and provisions.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
308B.1	Remember	STATE EXIM Policy/Procedures related to agricultural exports.
308B.2	Understand	DISCUSS the role of GATT, WTO and other International Institutions associated with Agri Import and Export Management.
308B.3	Apply	USE various acts related to Import and Export of Agricultural commodities.
308B.4	Analyze	COMPARE various export promotion measures related to different agricultural commodities
308B.5	Evaluate	SUPPORT the Institutional Linkage for Export Promotion.
308B.6	Create	DEVELOP Import Export Business Plan for Agricultural Commodities.

Course Contents:

Unit 1: Recap

Review of EXIM policy / procedures, Potentials and emerging focus area for Agricultural exports (FAO), Constraints in international trading in Agricultural Commodities.

Unit 2: GATT / WTO

Introduction to GATT/ WTO, International Trade in Agricultural Commodities (AoA), Policy of GOI for International Trade in Agricultural Commodities, QC and QA for international trading in Agricultural Commodities, Sanitary and Phyto sanitary measures (SPS)- ISPM, Quarantine regulation for Imports and Exports.

Unit 3: Institutional Linkage for export promotion

Commerce Ministry, DGFT and export promotion councils, Commodity boards (Spice Board, Tea Board, and Coconut Board), Trade development authority and trade fair authority, SEZ, FIEO, ECGC, APEDA/GOI/GOM/NHB/NHM/MofPI, Export inspection council, Role of Multinationals in Agricultural Development, Residue Monitoring Plan for export, Advance certification in export (advance packaging, Government support for infrastructural facilities for cold storages, pre cooling, ripening chamber, irrialiatiation).

Unit 4: Acts related to import and export

Acts and provisions for international trading in Agricultural Commodities/ GlobalGap/HALCP/ BRC/PGI/India Gap/POP/Organic Certification.

Unit 5: Export Documentation

How to start import and export business of Agricultural commodities (Documentation), Case studies, Use of Information Technologies in Agri Exports.

Prescribed Books

1. EXIM Hand Book and Procedure, Min of Commerce, GOI, 2009-14.
2. Export Potential of Indian agriculture by Dr. Gursharan Singh Kainth, published by Regency Publication, New Delhi.
3. Agri Business Management by SmitaDiwase, published by Everest Publishing House, Pune.
4. Agricultural Marketing Management by Premjit Sharma, Published by Gene Tech Books Publishing House, New Delhi.
5. Agri Business Management by Dr J Amarnath and Dr. APV Samvel, Published by Satish Serial Publishing House, Delhi.

Website:

1. www.mepz.gov.in/eximPolicy.
2. www.nic.in/eximpolicy.

COURSE CODE	MB309B
COURSE TITLE	EMERGING TRENDS IN ORGANIC FARMING
COURSE CREDITS	3

Course Description:

Course introduce the student regarding various types of healthy and nutrient rich foods, emerging trends in organic farming management. It discusses the scope of avoidance of food borne diseases and sustainable lively hood.

Course Objectives:

1. To introduce the importance of emerging trends in organic farming management towards sustainability.
2. To understand various aspects of organic farming Management and its marketing.
3. To introduce organic perspectives conventional organic agriculture and National & International Organic Policy.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
309B.1	Remember	STATE the major conceptual framework, theories, scope of Emerging trends in Organic Farming.
309B.2	Understand	EXPLAIN post-harvest Management of Organic Crops/Fruits/Vegetables.
309B.3	Apply	USE of Marketing functions for Organic Farm Produce with emerging trends in Organic Farming.
309B.4	Analyze	CONTRAST the domestic and international standards for certification of organic products.
309B.5	Evaluate	SELECT the appropriate assessment method for Organic Farm Produce.
309B.6	Create	DEVELOP the model or prototype for organic farming.

Course Outline:

Unit 1: Introduction to Organic Farming

Meaning, Concept, Importance and Scope, Current scenario of Organic Farming in India, Historical development of Organic Agriculture in India, Soil Management for Organic plantation.

Unit 2: Post Harvest Management of Organic Crops / Fruits / Vegetables

Current Industrial Requirement of Organic Produce, Actual Processing of Organic Produce without making loss of nutrients, Pre and Post harvesting techniques for Organic Produce, Packaging, Labelling, Nutrients management in Organic Produce.

Unit 3: Marketing of Organic Farm Produce

Concept of Product, Evaluation of Product, Branding of Product, Marketing in domestic market w.r.t. Milk, Cereals, Pulses, Legumes, Fruits and Vegetables, Opportunities in Export of Organic produce, Use of Digital Marketing for Organic Produce, Pricing Strategy for Organic Produce.

Unit 4: Standards, Inspection and Certification of Organic Unit

Indian certification agencies- National Accreditation Board for Testing and Calibration Laboratories (NABL), Tamil Nadu Organic Certification Department (TNOCD), Agricultural and

Processed food products Export Development Authority (APEDA), Spice Board, Coffee Board, Tea Board, International certification agencies- Argencert, California Certified Organic Farmers (CCOF), International Federation of Organic Agriculture Movements (IFOAM) and standards, The Ecological Farming Association, Organic Farming Research Foundation (OFRF), Organic trade Association, Community Alliance with Family Farmers, Institute for Marketecology (IMO), SKAL, ECOCERT INTERNATIONAL, DEMETER.

Unit 5: Assessment and Evaluation of Organic Products

Product Analysis by machines, Sorting, Grading of Organic Produce, Quality management aspects of Organic Farm Produces- Cereals, Vegetables, Microgreens, Exotic plants, Procedure for Accreditation, Difficulties in Organic Farm Management.

Prescribed Books:

1. The World of Organic Agriculture, Helga Willer, Minou Yussefi, Neil Sorensen, Earthscan Publications, 2008.
2. Trends in Organic Farming in India, Purohit S.S. & Gehlot, Dushyent (Eds.).
3. The Complete Book on Organic Farming and Production of Organic Compost, NPCS Board of Consultants & Engineers.
4. Organic Farming: Theory and Practice, S.P. Palaniappan , K. Annadurai Scientific Publishers.
5. ABC of Organic Farming, Amitava Rakshit and H B Singh, Jain brothers.

Suggested Readings:

1. Organic Farming: Everything You Need to Know, Peter V. Fossel, MBI Publishing.
2. The Natural Way of Farming: The Theory and Practice of Green Philosophy, Masanobu Fukuoka.

GBS RC MBA Syllabus

FINANCIAL MANAGEMENT SPECIALIZATION

PSO 1: Demonstrate the Proficiency in Financial Management domain like Financial accounting, Taxation, Corporate Financial Management, Security Analysis, Financial Modelling, Financial Markets & Derivatives, Equity Research & Financial Technology to facilitate informed decision making & optimally solve the business problems.

PSO 2: To inculcate the ability to gain multidisciplinary knowledge through case analysis, numerical exercises, projects-based Learnings and Internships, Corporate Sessions, Research Conference to support the Finance Function

COURSE CODE	MB303C
COURSE TITLE	ADVANCED CORPORATE FINANCE
COURSE CREDITS	3

Course Description: This course is designed to introduce students to both the theory and application of corporate decisions in various corporate contexts. This advanced course in corporate finance covers a range of topical corporate finance issues including cost of capital, capital budgeting, and dividend decision. This course will help students to generate ideas, concepts and tools managers use to make the right financial decisions.

Course Objectives:

1. To understand how corporate finance practices vary.
2. Analyze the impact of capital structure, dividend decision on the value of the firm.
3. Discuss practices to rationalize capital budgeting decisions.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
303C.1	Remember	STATE key concepts, theories, models & frameworks in the field of Advanced Corporate Finance
303C.2	Understand	RELATE with various types of transactions & risks in Foreign exchange market
303C.3	Apply	DEMONSTRATE the use of various Dividend distribution models for maximizing value.
303C.4	Analyze	COMPARE & CONTRAST between different types of capital structure theories.
303C.5	Evaluate	APPRAISE the projects for their acceptance / rejection using various capital budgeting tools.
303C.6	Create	DEVELOP long term & short term financial plans for a business organization.

Course Outline:

Unit 1: Capital Structure & Leverage Analysis

Meaning and Significance of capital structure, Features of Optimum Capital Structure, Capital Planning: EBIT – EPS Analysis, Capital structure theories: NI, NOI, MM approach, Meaning & types of leverages, over capitalization and under capitalization, trading on equity.

Unit 2: Capital Budgeting

Overview of capital budgeting, Accounting Profits v/s Cash Flow after tax, Discounted Cash flow methods - Net Present value (NPV), Profitability Index (PI), Discounted Payback Period, Internal Rate of Return (IRR), MIRR, NPV Vs. IRR, Project selection under capital rationing, Inflation and capital budgeting, replacement project cash flows.

Unit 3: Dividend and Share Repurchase Policy

Various aspects of dividend policy, Statutory framework of dividend, Bonus issue - Meaning, implications & SEBI norms, Rights issue - Meaning, implications & SEBI norms, Different dividend theories - Walter's, Gordon's, MM model, Share split, Buy back of shares.

Unit 4: Financial forecasting and planning

Overview of financial planning, Developing long term financial plan, Developing short term financial plan (cash budget).

Unit 5: International Business Finance

Foreign Exchange rates, Types of foreign exchange transactions, Purchasing-power parity, Interest rate parity, exchange rate risk, Translation exposure, transaction exposure and economic exposure.

Prescribed Books:

1. Financial Management- I M Pandey, Vikas Publishing.
2. Financial Management - MY Khan & PK Jain, Tata McGraw-Hill.
3. Financial Management Principles and Applications – Sheridan Titman, Arthur J. Keown, John D. Martin, Pearson.

Suggested Readings:

1. Contemporary Financial Management - Rajesh Kothari, Macmillan Publication.
2. Principles of Corporate Finance - Richard A Brealey, Stewart C Myers, Franklin Allen, Pitabas Mohanty, Tata McGraw Hill.
3. International Financial Management – O.P. Agarwal, Himalaya Publishing House.

COURSE CODE	MB304C
COURSE TITLE	FIXED INCOME SECURITIES
COURSE CREDITS	3

Course Description

This course is intended to analyze the fixed income securities market and its importance /implications for investments. It covers the market characteristics and its linkage with money market, etc. Fixed income instruments, the risks associated with various types of FI securities/markets and their measurement and management.

Course Objectives:

1. To understand the structure and mechanism of Fixed Income Market.
2. To analyze the application of Yield Curve.
3. To comprehend the structure of corporate debt market various corporate debt instruments.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
304C.1	Remember	STATE key concepts & theories applicable to Fixed Income Securities Market
304C.2	Understand	EXPLAIN the features of Government Securities & Money Market Instruments
304C.3	Apply	DEMONSTRATE the use of theories & principles for making informed investment decisions with respect to fixed income securities market.
304C.4	Analyze	COMPARE & CONTRAST between different types of Fixed Income Derivatives
304C.5	Evaluate	APPRAISE the various corporate debt instruments for their valuation
304C.6	Create	FORMULATE a risk hedging strategy for investment in bond market

Course Content:

Unit 1: Introduction

Overview of Fixed Income Markets, Institutional Arrangements, Market Participants and Instruments, Investors Perspectives and Market Conventions, Regulation of Fixed Income Market & the role of the regulator, Features of Government securities market, Money Market Instruments, Asset Backed Securities, Corporate Bonds.

Unit 2: Bond Valuation

Time Value of Money, Types of Bond yields – Current Yield, Yield to Maturity, Realised Yield to Maturity, Yield to Call, Valuation & Pricing of Bond under flat term structure, Yield curve, Bond values & Interest Rates, Term Structure of Interest Rates, Clean price & Dirty price, Bond market volatility, Types of Duration – Macaulay's Duration, Modified Duration, Convexity &

Immunisation, Illiquid bonds, Yield Curve Analysis: Par Value, Spot Curve, Bootstrapping Technique.

Unit 3: Auction Game

Portfolio construction, setting portfolio objectives, interpreting portfolio parameters, Passive vs Active portfolio management strategies, bullet vs barbell, other strategies, global bond markets, foreign currency bonds, dual currency bonds.

Unit 4: Fixed Income Derivative Markets

Interest rate Swaps, swap pricing and swap curve, interest rate futures, Interest Rate Options, Caps and Floors pricing.

Unit 5: Corporate Debt Market

Instruments - Features and Valuation, Valuation of Convertibles, Prime and Subprime Mortgage-Backed Securities.

Prescribed Books:

1. Fixed Income Securities – Dun and Bradstreet, McGraw Hill Education India.
2. The handbook of Fixed Income Securities – Frank J. Fabozzi, Steven V. Mann, McGraw Hill.
3. Fixed Income Securities: Valuation, Risk, and Risk Management - Pietro Veronesi, Wiley.

Suggested Readings:

1. Fixed Income Analysis (CFA Institute Investment Series) - Barbara S. Petitt Jerald E. Pinto Wendy L. Pirie, 3rd, Kindle Edition.
2. Fixed-Income Securities: Valuation, Risk Management and Portfolio Strategies - Lionel Martellini, Philippe Priaulet, Wiley Finance Series.

COURSE CODE	MB305C
COURSE TITLE	FINANCIAL DERIVATIVES
COURSE CREDITS	3

Course Description:

This course covers financial derivatives such as forward contracts, futures contracts, options, swaps and other recently created derivatives. It follows pragmatic approach and discusses both the derivative markets and the derivative products and their use. The emphasis of the course is on the successful execution of financial strategies using derivatives as product. It focuses on practical understanding of how the derivative markets function, how the derivative products are used and why they are used and how they are usually priced.

Course Objectives:

1. To understand the meaning and uses of various derivative products.
2. To learn how to value options using various tools.
3. To analyze the hedging tools for decision making.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
305C.1	Remember	STATE key concepts, theories & frameworks in the field of Financial Derivatives.
305C.2	Understand	RECOGNIZE the features of Forward & Futures contract in case of Financial Derivatives Market
305C.3	Apply	DEMONSTRATE the use of theoretical framework for estimation of payoffs to derivative market traders
305C.4	Analyze	DISTINGUISH between various risk measurement parameters in Financial derivatives market
305C.5	Evaluate	APPRAISE the various factors affecting Option valuation
305C.6	Create	FORMULATE a risk hedging plan for trading in financial derivatives market

Course Content:

Unit 1: Introduction to Derivatives

Meaning of derivatives. Legal & Regulatory Environment, Types of derivatives. Derivative market – India, World. Reasons for trading derivatives, Derivative pricing, Difference between exchange traded and OTC derivatives.

Unit 2: Forwards and Futures

Meaning of Forwards and Futures, Structure of forward market, Types of forward contracts - Equity forward - Currency forward - Bond and interest rate forward - Forward rate agreement, Types of future contracts - Stock future - Index future - Currency future - Interest rate future - Commodity future Market for forward and futures, Marking to market and margins.

Unit 3: Option market and products

Structure and Role of Global Option Market including OTC and leading Option Exchanges, Concept, characteristics and definition, Option terminologies - Call option -Put option-American and European option-Option writer and buyer-Option premium including intrinsic value and time value -Strike price -ITM, ATM and OTM - Option payoff, Trading mechanism and concept of margins, Types of options- Stock option-Index option- Currency option - Commodity option-Options on futures - Interest rate options, Put -Call Parity, Option strategies (spreads, straddles and strangles).

Unit 4: Valuing Options

Factors affecting option valuation, Binomial model, Black-Scholes model, Monte-Carlo simulation.

Unit 5: Hedging and the “Greeks”

“Greeks” – delta, gamma, vega, theta & rho, Principle of delta-hedging, Delta-hedging, Asset mismatch, maturity mismatch, basis risk, and minimum-variance, hedging, Delta-Gamma hedging using options. Accounting and Taxation of Derivative Transactions.

Prescribed Books:

1. Derivatives Theory and Practice - Keith Cuthbertson, Dirk Nitzsche, Niall O'Sullivan, Wiley.
2. An Introduction to Derivative Securities, Financial Markets, and Risk Management- Robert Jarrow, Arkadev Chatterjea, World Scientific.
3. Financial Markets for Commodities - Joel Priolon, Wiley.

Suggested Readings:

1. Derivatives and Risk Management - Janakiraman S, Pearson.
2. Options, Futures and Other Derivatives: Global edition - John Hull, 8/E, Pearson Higher Education.

COURSE CODE	MB306C
COURSE TITLE	TAXATION
COURSE CREDITS	3

Course Description :

This course introduces students to the accounting for income taxes with a particular focus on analyzing differences between accounting and tax treatments, computing tax provisions, and disclosing tax information in corporate financial statements. The course also provides exposure to the both internal and external uses of tax accounting disclosures. In doing so, the course builds a solid grounding in the preparation of accounting information, but also helps students gain an appreciation for the role of financial accounting in tax planning and compliance decisions.

Course Objectives :

1. To develop a broad understanding of the tax laws and accepted tax practices.
2. To acquaint the students with basic principles underlying the provisions of direct and indirect tax laws.
3. To introduce practical aspects of tax planning as an important managerial decision-making process

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
306C.1	Remember	DEFINE the basic terms of income tax act 1961
306C.2	Understand	EXPLAIN the basic terms and structure of GST
306C.3	Apply	CHOOSING online filling of various forms and returns
306C.4	Analyze	ANALYSE Gross Total Income of an individual assessee
306C.5	Evaluate	ASSESS Income Tax Liability of an individual assessee
306C.6	Create	DEVELOP tax saving plans

Course Contents :

Unit 1: Income Tax Act -1961: Basic Concepts and Definition

Introduction, Brief history of Income Tax in India, Scope of the Act, Concept and definitions- Income, Person, Assessee, Assessment year, Previous year, Residential Status of an Assessee and Tax Liability.

Unit 2: Computation of Taxable Income from Salary and House Property

a) Income from Salary: Meaning of salary, components of salary, Salient features, allowances and tax Liability- Perquisites and their Valuation- Deduction from salary. (Theory and Problems).

b) Income from House Property: Basis of Chargeability-Annual Value- Self occupied and let out property- Deductions allowed. (Theory and Problems).

c) Computation Profits and Gains of Business and Profession: Meaning of Business and Profession, Income chargeable to tax under section 28, Deductions expressly allowed u/s 30 to 35, Expenses allowable as deduction u/s 37, Expenses allowable under specific instruction of CBDT, Computation of Profits and Gains. Presumptive Taxation Scheme. (Theory and Problems).

d) Income from Capital Gains: Meaning, Short Term and Long term Capital Assets, Types of Capital Gains, Procedure for computation of Capital Gains. (Theory and Problems).

e) Income from Other Sources: Meaning of Specific Income and Other Income, Practical problems

on calculation of Income from Other Sources.

Unit 3: Computation of Total Taxable Income of an Individual:

Meaning and concept, Deduction from Gross Total Income, deduction u/s-80C. Determination of Income Tax Liability.

Unit 4: Miscellaneous

Assessment procedure, returns, Advance payment of tax and tax deducted at source, Personal Financial Planning.

Unit 5: Goods and Service Tax Act

Meaning of indirect taxes, history of indirect taxes in India, Origin of Value Added tax (VAT), meaning of VAT, Advantages and disadvantages of VAT, History of GST In India, Meaning of GST, Salient features of GST, Benefits of GST, Dual GST Model, Special features of Dual GST Model, Present GST model in India.

Prescribed Books:

1. Singhanar V.K: Students' Guide to Income Tax; Taxmann, Delhi.
2. Prasaci, Bhagwati: Income Tax Law and Practice: Wiley Publication, New Delhi,
3. Mehrotra H.C: Income Tax Law and Accounts, Sahitya Bhawan, Agra.
4. Dinker Pagare, Income Tax Law and Practice: Sultan Chand and Sons, New Delhi.
5. Girish Ahuja and Ravi Gupta: Systematic approach to income tax: Sahitya Bhawan Publications, New Delhi.
6. Chandra Mahesh and Shukla D.C.: Income Tax Law and Practice; Pragati Publications, New Delhi.

GBSRC MBA Syllabus

COURSE CODE	MB307C
COURSE TITLE	SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT
COURSE CREDITS	3

Course Description :

Security analysis and portfolio management course is to help students understand the investment field for sound investment decisions making. This course is designed to emphasize both theoretical and analytical aspects of investment decisions and deals with modern investment theoretical concepts and instruments.

Security Analysis is the subject to study the composition and performance of stocks in capital market. The stocks are analyzed using tools of fundamental analysis and technical analysis.

Portfolio management refers to the management or administration of a portfolio of securities to protect and enhance the value of the underlying investment. It is the management of various securities (shares, bonds etc) and other assets (e.g. real estate), to meet specified investment goals for the benefit of the investors. It helps to reduce risk without sacrificing returns.

Course Objectives:

1. To develop an understanding of the changing domestic and global investment scenario in general and Indian capital market in particular with reference to availability of various financial products and operations of stock exchanges.
2. To provide an in-depth knowledge of the theory and practice of portfolio management.
3. To study the alternative investment decisions in the context of portfolio investment.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
307C.1	Remember	MEMORIZE various concepts and theories related to Security analysis and portfolio management.
307C.2	Understand	EXPLAIN various theories of Investment Analysis and Portfolio Management.
307C.3	Apply	EXECUTE investment decisions with respect to risk and return using various concepts.
307C.4	Analyze	EXAMINE the intrinsic value of a security.
307C.5	Evaluate	EVALUATE the portfolio performance as per risk appetite.
307C.6	Create	DESIGN a diversified portfolio which meets the targets and mitigates the risk.

Course Contents:

Unit 1: Markets and Financial Instruments

Investment Objectives, Types of Markets- Equity, Debt, Derivatives, Commodities, Various types of Investment Avenues, Difference between Speculation and Investment.

Unit 2 Mutual Funds

The Concept of Mutual Funds, Advantages of Mutual Funds investing, Types of Funds

Unit 3: Risk and Return

Concept of risk and return, Measurement of risk - standard deviation and variance, Factors influencing risk, relationship between risk and return, CAPM

Unit 4: Fundamental Analysis

Economy analysis, industry analysis and company analysis, weaknesses of fundamental analysis.

Technical Analysis

Tools of technical analysis, important chart formations, price patterns and technical indicators.

Unit 5: Portfolio Theory and Portfolio Management

Efficient Market Theory, Random Walk Theory, Portfolio Management Framework, Guidelines for Investment Decisions.

Prescribed Books:

1. P Pandian, Security Analysis and Portfolio Management, Vikas Publishing Houses.
2. P Chandra, Security Analysis and Portfolio Management, McGraw Publishers.
3. Fischer, Security Analysis and Portfolio Management, Pearson India.

GBSRC MBA Syllabus

COURSE CODE	MB308C
COURSE TITLE	ANALYSIS OF FINANCIAL STATEMENTS
COURSE CREDITS	3

Course Description :

This course describes the analysis of financial statements and company valuation. Financial statement analysis is the application of analytical tools, technology and techniques to general-purpose financial statements and related data to derive estimates and inferences useful in business analysis. Financial statement analysis comprise of accounting analysis, financial analysis and valuation.

Course Objectives:

1. To study the interrelationships between financial statement line items.
2. To use ratio analysis to understand and compare firms.
3. To understand the effect of accounting disclosures.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
308C.1	Remember	DEFINE basic terminologies of financial statement
308C.2	Understand	EXPLAIN techniques of financial statement analysis
308C.3	Apply	CONDUCT financial statement analysis or research
308C.4	Analyze	ANALYSE financial statements of corporates through various methods
308C.5	Evaluate	ASSESS the impact of business decisions on various Financial Statements
308C.6	Create	DEVELOP reports on financial performance of the firms

Course Contents:

Unit 1: Introduction to Financial Statements

Introduction, Meaning, Nature, Essentials, Importance and Objectives of Financial Statements, Concept of Published Accounts, Constituents of Financial Statements, Important features of presentation of Balance Sheet as per Schedule III, Limitations of Financial Statements.

Unit 2: Techniques of Financial Statement Analysis

Meaning, Objectives, Methods of Financial Statement Analysis, Comparative Statements - Income Statement and Balance Sheet, Common size statements - Income Statement and Balance Sheet, Consolidated Statements – Income Statement and Balance Sheet.

Unit 3: Ratio Analysis

Definition, Importance of Ratio Analysis, Limitations, Classification of ratios, Functional Classification- Liquidity Ratio, Profitability Ratio, Activity Ratio, Leverage Ratio, Valuation Ratios. Importance and Measurement of each ratio - Theory and Problems, Interpretation of Ratios.

Unit 4: Cash Flow Statement

Meaning of Cash and Cash Equivalents, Benefits, Limitations, Classification of Activities – Operating, Investing, Financing, Ascertainment of Cash Flow from different activities, Preparation of Cash Flow Statement, Analysis of Listed companies Cash Flow Statement.

Unit 5: Miscellaneous

Internal liquidity analysis, Operating / Risk / Growth Analysis, DuPont analysis - Return on equity, Risk analysis, Capitalization vs. Expensing, Depreciation, Inventories, Income Tax, Window dressing, Scandals in financial reporting.

Prescribed Books:

1. Wendy McKenzie, Using and Understanding Company Accounts, Prentice Hall, 2003.
2. Frank J. Fabozzi, Pamela P. Peterson, Analysis of Financial Statements, Frank J. Fabozzi Associates, New Hope, Pennsylvania, 1999.
3. Lyn M. Fraser, Aileen Ormiston, Understanding Financial Statements, Prentice Hall, 2006.

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COURSE CODE	MB309C
COURSE TITLE	FINANCIAL TECHNOLOGY
COURSE CREDITS	3

Course Description:

Financial technology, commonly called ‘FinTech’, is now a highly used buzzword. FinTech is the application of digital technologies to create record, transfer and manage financial value and risk. The financial services industry is undergoing a continuous transformation brought in by the never ending stream of digital disruptions. Over the past decade, many new FinTech firms have disrupted the conventional financial services industry by leveraging these new technologies and offering customized, value-added services in a rapid manner. The Financial Services industry is witnessing a huge transformation driven by innovative technologies such as Blockchain, Artificial Intelligence, Cloud Computing, Internet of Things and Mobile Computing.

Course Objectives:

1. To help students develop a broad understanding of FinTech and its impact on the financial system.
2. To enable students understand how FinTech corporations are changing the traditional currency regime.
3. To engage students in the process of FinTech innovation.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom’s Level	Course Outcomes
309C.1	Remember	STATE various concepts and typologies associated with financial technology.
309C.2	Understand	EXPLAIN the evolution of Fintech regulation and Regtech ecosystem.
309C.3	Apply	DEMONSTRATE the understanding of block chain technology and its applications in finance.
309C.4	Analyze	EXAMINE the role of AI and crowd funding in digital finance.
309C.5	Evaluate	APPRAISE the role of FinTech in financial inclusion and financial integration.
309C.6	Create	INVESTIGATE various UPIs and their implications on online payment system.

Course Outline:

Unit 1: Meaning of FinTech

FinTech Transformation, FinTech Evolution 1.0: Infrastructure FinTech Evolution 2.0: Banks, FinTech Evolution 3.0 & 3.5: Startups and Emerging Markets FinTech Typology, Emerging Economics: Opportunities and Challenges.

Unit 2: FinTech Regulation and RegTech

FinTech Regulations, Evolution of RegTech, RegTech Ecosystem: Financial Institutions, RegTech Ecosystem: Startups, RegTech Startups: Challenges, RegTech Ecosystem: Regulators.

Unit 3: Blockchain and Cryptocurrency

Essence of Blockchain, Blockchain Technology and application from a financial perspective,

Bitcoin, Virtual Currencies, Integration of Artificial Intelligence.

Unit 4: Digital Finance and Alternative Finance

History of Financial Innovation, Digitization of Financial Services, FinTech & Funds, Integration of AI in Fintech, Crowdfunding - Regards, Charity and Equity, P2P and Marketplace Lending.

Unit 5: FinTech in India

Digital India and its role in promoting FinTech, Role of FinTech in Financial Inclusion and Financial Integration, Implications of FinTech Developments for Banks and Bank Supervision, Understanding UPI – Unified Payments Interface and its implications, Emerging Payment Systems. Performance of Indian FinTech companies.

Prescribed Books:

1. Sonar, Rakesh and Dr Awadhesh Pratap Singh: The Journey of REGTECH, Michael Terence Publishing, 2020.
2. Phadke, Sanjay: FinTech Future: The Digital DNA of Finance, Sage Publication.

Suggested Reading:

Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfeder. Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction Princeton University Press.

GBSRC MBA Syllabus

HUMAN RESOURCE MANAGEMENT SPECIALIZATION

PSO-1: Demonstrate the Proficiency in **Human Resource Management** domain like Strategic Human Resource Management, Performance and Compensation Management, Talent Acquisition and Retention, Training and Development, Personnel Administration and Documentation to optimally solve the business problems.

PSO-2: To inculcate the ability to gain multidisciplinary knowledge through Case Analysis, Projects-Based Learnings, Internships, Industrial Visits, Corporate Sessions to support the Human Resource Function.

COURSE CODE	MB303D
COURSE TITLE	HUMAN RESOURCE PLANNING
COURSE CREDITS	3

Course Description:

Planning people requirements is critical task of management as companies increasingly depend on intellectual capital as the basis for competitive advantage. This course aims at imparting relevant knowledge required to perform the functions of human resource planning within an organisation.

Course Objectives:

1. To familiarize the students with the basic concepts, tools and techniques of work study to assess the human resources requirements quantitatively.
2. To familiarize the students with the basic concepts, tools and techniques of qualitative measurement of human resources requirements.
3. To enable the students to acquire the knowledge necessary for preparing the manpower plan of a business enterprise and subsequent plans of actions.
4. To train them in application of human resource planning techniques.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
303D.1	Remember	DEFINE the basic concepts, theories, and techniques to quantitatively assess human resources requirements.
303D.2	Understand	DESCRIBE the models and methods used in forecasting demand and supply of human resources.
303D.3	Apply	USE the knowledge of human resource accounting techniques for human resource planning.
303D.4	Analyze	INTERPRET the organization's manpower planning program to measure the human resources requirements.
303D.5	Evaluate	CRITIQUE the effectiveness of various techniques used in Human Resource Planning.
303D.6	Create	CONSTRUCT a model of Human Resource Planning by studying the recent trends.

Course Outline:

Unit 1: Manpower Planning and Resourcing: Factors Affecting Manpower Planning, Need for Manpower Planning, Five Steps in Manpower Planning, Importance of Manpower Planning, Obstacles in Manpower Planning, Advantages of Manpower Planning, Consolidated Demand Forecast Development.

Unit 2: Manpower Forecasting: Introduction, Forecasting, Necessity for forecasting, Steps in forecasting, Demand and supply forecasting, Demand Forecasting techniques, Forecasting accuracy, Benefits of forecasting.

Unit 3: Human Resource Accounting: Introduction, Definition of Human Resource Accounting, Need, Significance, Objectives for HRA, Advantages of HRA, Methods of HRA, Objections to HRA, Controlling Manpower Costs, True Costs of Planning and Recruitment, Human Resource Accounting in India.

Unit 4: Developing a Manpower Plan: Introduction, Developing a Manpower Plan, Qualitative Side of Manpower Planning, Behavioral Event Interviewing, Standard Interviews, Competency Mapping (Skill Inventory), Problems in Manpower Planning, Sample Manpower Plan.

Unit 5: Recent Trends in Manpower Development and Planning: Introduction, Competency mapping, Knowledge management, E-Manpower Development, E-Manpower planning.

Prescribed Books:

1. Human Resource Planning, D K Bhattacharyya, Excel Books India, 2009.
2. Human Resource Planning: Solutions to Key Business Issues Selected Articles, David M. Schweiger, Springer-Verlag.

Suggested Readings:

1. The Challenge of Human Resource Planning: Selected Readings, James W. Walker, Karl F. Price, Human Resource Planning Society, 1982.
2. Good to Great: Why Some Companies Make the Leap...and Others Don't Book by James C. Collins.

COURSE CODE	MB304D
COURSE TITLE	TALENT ACQUISITION AND STAFFING
COURSE CREDITS	3

Course Description:

The course would give an overview of staffing and selection domain in the organizational context .It touches the concepts of support activities, recruitment, selection, workforce planning. Law affecting recruitment of candidates. Sources of recruitment. Cost & time involved in bringing the candidate on-board. It also stresses on the skills and techniques required in the various activities associated with the recruitment & selection of a prospective or an experienced candidate.

Course Objectives:

The objective is to learn the strategies, concepts and practices essential to the effective selection of personnel to meet the business objectives with an emphasis on recruiting, promoting and retraining employees. It will also focus on interviewing techniques, assessments, testing, background check legal requirements and reporting of results to management. It demonstrates how staffing and an organization's staffing decisions influences an organizations' competitiveness and ability to achieve its strategic objectives.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
304D.1	Remember	DEFINE the various concepts and processes of talent acquisition
304D.2	Understand	DISCUSS the importance of staffing strategy and review the decisions pertaining to staffing issues
304D.3	Apply	APPLY the appropriate role of competency in hiring decisions for effective acquisition process
304D.4	Analyze	ORGANIZE the process of recruitment and selection through a holistic and integrated assessment approach.
304D.5	Evaluate	RELATE the talent acquisition strategies in accordance with position requirements using social media.
304D.6	Create	FORMULATE appropriate talent acquisition strategies that are aligned with job requirement using social media

Course Outline:

Unit 1 : Introduction to talent acquisition

Concept of talent acquisition, Role of HR function vis-a vis Talent Acquisition, talent acquisition strategy, talent acquisition process.

Unit 2: Organizational Staffing

Concept of staffing, nature of staffing, staffing models, staffing Strategy, issues in staffing.

Unit 3: Competency Based Recruitment and Selection

Concept of competency, competency assessment and mapping, competency-based HRM Vs traditional HRM, competency based recruitment and selection ; competency based interviewing

and selection.

Unit 4: Staffing Activities

Trends in recruitment, job analysis; job description and specification, recruitment strategy development, searching and applicant reaction-external, assessment methods; substantive, discretionary, contingent.

Unit 5: Social Media Recruitment

Introduction to social media recruitment, advantages and disadvantages, practice of online assessment, online testing design, candidate data security and privacy.

Prescribed Books:

1. Strategic Staffing, Jean M Phillips, Stan M Gully, 3rd edition, Pearson.
2. Recruitment & Selection-A Competency Approach, Gareth Roberts, CIPD.

Suggested Readings:

1. Competency –Based Recruitment & Selection, Robert Wood & Tim Payne, Wiley.
2. Human Resource Planning, Dipak Kumar Bhattacharyya, 2nd edition, Excel Books.
3. Online Recruitment and Selection –Innovations in Talent Acquisition, Douglas H. Reynolds & John A. Weiner, Wiley- Blackwell.
4. Critical touch points of recruitment, Strategic HR inc. and bookboon.com

GBSRC MBA Syllabus

COURSE CODE	MB305D
COURSE TITLE	HUMAN RESOURCE DEVELOPMENT
COURSE CREDITS	3

Course Description:

Human Resource is among the most important sources of competitive advantage of the organizations. Competitive advantage can be built and realized depending on the degree to which the workforce is developed. Effective development of Human Resource is not an outcome of simply conducting standalone training programs. Rather, it requires strategic approach and development of systems around it. This course, distinct from Training and Development (T&D), gives more strategic perspective to the HRD system designing.

Course Objectives:

1. To understand the evolution and functions of HRD.
2. To identify the content, process and the outcomes of HRD applications.
3. To evaluate and understand diversity issues and their impact on organization.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
305D.1	Remember	STATE the various concepts, need and importance of HRD.
305D.2	Understand	DISCUSS various frameworks of Human Resource Development.
305D.3	Apply	MAKE USE OF the understanding of HR performance and benchmarking of the outcome based HRD applications.
305D.4	Analyze	QUESTION the existing HRD practices in a given organization for its improvement.
305D.5	Evaluate	SELECT the appropriate models and frameworks of Human Resource Development in Dealing.
305D.6	Create	DESIGN and develop appropriate HRD programs in order to deal with contemporary challenges.

Course Outline:

Unit 1: Human Resource Development

Evolution of HRD - Relationship with HRM - Human Resource Development Functions - Roles and Competencies of HRD Professionals - Challenges to Organization and HRD professionals - Learning and HRD – Learning Strategies and Styles.

Unit 2: Frame work of Human Resource Development

HRD Processes - Assessing HRD Needs - HRD Model - Designing Effective HRD Program - HRD Interventions- Creating HRD Programs - Implementing HRD programs - Training Methods.

Unit 3: Evaluating HRD Programs

Models and Frame Work of Evaluation - Assessing the Impact of HRD Programs - Human Resource Development Applications - Fundamental Concepts of Socialization - Realistic Job

Review - Career Management and Development.

Unit 4: Management Development

Employee counselling and wellness services – Counselling as an HRD Activity - Counselling Programs - Issues in Employee Counselling - Employee Wellness and Health Promotion Programs - Organizational Strategies Based on Human Resources.

Unit 5: Work Force Reduction, Realignment and Retention

HR Performance and Bench Marking – Managing globalization- Diversity Management - HRD programs for diverse employees.

Prescribed Books:

1. Recent Experiences in HRD, Rao, T.V., New Delhi. Oxford & IBH.
2. Human resource development & management 1ed, Ghosh Biswanath, Vikas Publication house pvt ltd.
3. Evaluation of HRD, Pareek, Udai, Jaipur, Rawat Publications.
4. Human Resource Management, S.S.Khanka, “ S. Chand & Company Ltd.

Suggested Readings:

1. Human Resource Management, Gary Dessler, Pearson Education.
2. Recruitment and Selection, Gerard V McMohan, Prentice Hall of India.

GBSRC MBA Syllabus

COURSE CODE	MB306D
COURSE TITLE	PERFORMANCE COMPENSATION MANAGEMENT
COURSE CREDITS	3

Course Description :

This course familiarizes students with the concepts of Performance and compensation management within the wider context of human resource management. It provides students with an understanding of the reward management process which includes pay survey, job evaluation, and the design of pay structure. Students will acquire basic data management techniques and recognize what are the factors that determine the pay levels and benefits of employees in the job market.

Course Objectives:

1. To gain a working knowledge of performance management systems.
2. To gain an enhanced ability to communicate effectively on issues relating to performance management.
3. To learn appropriate terminologies and practices regarding performance management.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
306D.1	Remember	DEFINE the concepts, functions & challenges related to Performance and Compensation Management.
306D.2	Understand	IDENTIFY competencies and its mapping, for planning and managing the performance.
306D.3	Apply	SOLVE issues pertaining to Rewards linked with performance vis-à-vis job satisfaction.
306D.4	Analyze	DISTINGUISH between performance appraisal and performance management system.
306D.5	Evaluate	CRITICIZE the performance and compensation management theories and practices.
306D.6	Create	FORMULATE step-by-step framework to implement enterprise-wise Performance Management System.

Course Contents:

Unit 1: Foundations of Performance Management

Concepts of Performance Management, Performance Appraisal to Performance Management, The five-Factor Model, Effective Performance Management and Challenges to PM, Introduction, Aims, Need, Elements, and Functions of PMS, Competency based PMS, E-Performance Management, Performance Counselling.

Unit 2: Performance Planning and Managing

Concepts of Performance Planning, Developing Performance Plan, Process and Barriers of Performance Planning, Effective Performance Plan, Performance Managing and Competency Mapping.

Unit 3: Performance Appraisal

Concepts of Performance Appraisal, Performance Appraisal Interview and Methods of Appraisal, Common Rating Errors and Pitfalls of Performance Appraisal, Good Performance

Appraisal System, Performance Monitoring.

Unit 4: Implementing Performance Management

Hindrances in Implementation of PM, Strategies for effective implementation of PM, Reward Management, Job performance and Job Satisfaction, Arguments for and against Performance based rewards, High Performance teams, HR Ethics and performance management.

Unit 5: Foundations of Compensation Management

Objectives, significance of Compensation, Wage and Compensation, Principles of Compensation Formulation, Theories of Wage determination, Types of wages and Significance of Employee Compensation, VI Theory, Compensation Decision, Types of Executive Compensation, Compensation Trends in India.

Prescribed Books:

1. A.S. Kohli and T. Deb, Performance Management, Oxford, 10th Edition.
2. D.K. Bhattacharya, Compensation Management, Oxford, 6th Edition.

Suggested Readings:

1. K. Ashwathappa, Human Resource Management, Tata MacGraw Hill, 4th Edition.
2. T. V. Rao, Performance Management, Response Books, 1st Edition.
3. Personnel Management by Edwin Flipp.
4. Personnel Management by C.B. Mamoria.

GBSRC MBA Syllabus

COURSE CODE	MB307D
COURSE TITLE	LABOUR LAWS
COURSE CREDITS	3

Course Description :

Labour laws are one of the most far-reaching, crucial aspects of a democracy. Their enshrinement in law and the mere fact of their existence acts as an often reliable safeguard to employment abuses. It provides an outlet for employee grievances, should there be justifiable reasons for such grievances.

Course Objectives:

1. To be acquainted with the Industrial relations framework in our country. Further, the importance of the maintenance of Industrial peace and efforts to reduce the incidence of Strikes and Lockout and Industrial Strike are to be emphasized.
2. To critically examine the machineries contemplated under the provisions of the Industrial Disputes Act 1947 for the prevention and settlement of Industrial Disputes.
3. To impart the students with the knowledge of various laws like andamp; how law affects the industry and labour.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
307D.1	Remember	MEMORIZE various basic terminologies related with Labour law.
307D.2	Understand	EXPLAIN the role of law in regulating industrial disputes and conflicts.
307D.3	Apply	INTERPRET various contexts i.e. internal or external in which Labour is regulated.
307D.4	Analyze	DISTINGWISH between various Labour, safety and security laws as per their application.
307D.5	Evaluate	CRITIQUE the procedures for certification and modification of standing orders and judicial system.
307D.6	Create	DESIGN some enforcement mechanism pertaining to his/her organization.

Course Contents:

Unit 1: Introduction to Industrial Relations

Industrial Disputes, Causes and effects of industrial disputes, Grievance and disciplinary action.

Unit 2: Strikes and Lockouts

Types of strikes, Legal provision in respect of strikes, Lockout and unfair labour practices Industrial Disputes Act 1947: objectives, definitions, the prohibition of strikes and lock outs, lay-offs, retrenchment and closure. Unfair labour practices, settlement machinery.

Unit 3: Retrenchment:

Legal provisions and formalities of retrenchment, layoff, Voluntary retirement scheme, golden shake hands schemes, Closers.

Labour Welfare: Voluntary Welfare Measures, Bonus calculation, Statutory Welfare Measures, PF

and gratuity calculations, Introduction to occupational health, Well-being of employee-Job insecurity, working hours and control at work.

Unit 4: Legal framework

Introduction to Factories act 1948, Industrial Disputes Act-1947, Workmen's Compensation Act-1923, Standing Orders Act-1964, Domestic Enquiry and Principles of Natural Justice, Trade union act 1926, Social security Acts: Objectives, applicability and definitions, Procedures for certification and modification of standing orders, matters to be provided in standing orders.

Unit 5: The payment of wages act 1936, The minimum wages act 1948, The Payment of Bonus act 1965, Industrial Employment (standing Order) Act 1946, applicability and definitions, Provisions and permissible deductions, the enforcement machinery, Penal provisions.

Prescribed Books:

1. Mamoria-Dynamics of Industrial relations.
2. S. P Jain – Industrial and Labour Laws.

Suggested Readings:

1. S. C Srivastava - Social Security and Labour Laws.
2. S. N Mishra - Labour Laws.
3. Srivastava K. D - Commentaries on Industrial Disputes Act, 1947.
4. V. V Giri - Labour problems in Indian Industry.
5. Malhotra O. P - Industrial Disputes Act Vol. I and II.
6. Labour Law and Labour Relations Published by Indian Law Institute.
7. Madhavan Pillai - Labour and Industrial Laws.

COURSE CODE	MB308D
COURSE TITLE	STRATEGIC HRM
COURSE CREDITS	3

Course Description :

Strategic HRM will deal with various issues of strategic HRM. The course will cover various topics ranging from Organisation theory, Economics, Labor market issues, performance management systems, recruitment training and retention of employees.

Course Objectives:

1. To study a strategic framework for integrating and applying HRM.
2. To study the global human resources environment in which your organization operates.
3. To gain understanding, knowledge, and skills to make strategic human resource management decisions.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
308D.1	Remember	STATE various terms and concepts related with human resource environment with a strategic view.
308D.2	Understand	IDENTIFY global competition and the requirement of strategic approach.
308D.3	Apply	MAKE USE OF training needs assessment to adopt appropriate techniques and tools for training.
308D.4	Analyze	Work at an optimum level, to EXAMINE HR strategies in relation to their application at the workplace.
308D.5	Evaluate	JUSTIFY the performance appraisal with respect to reward and compensation strategies.
308D.6	Create	FORMULATE the framework of performance appraisal system for a given organization.

Course Contents:

Unit 1: Introduction To Strategic HRM

Definition, need and importance; Introduction to business and corporate strategies; Integrating HR strategies with business strategies; Developing HR plans and policies.

Human Resource Environment :

Technology and structure; Workforce diversity; Demographic changes Temporary and contract labour; Global environment; Global competition Global sourcing of labour; WTO and labour standards.

Unit 2: Recruitment and Retention Strategies

Online recruitment; Employee referrals; Recruitment process outsourcing Head hunting; Executive education; Flexi timing; Telecommuting Quality of work life; Work - life balance; Employee empowerment Employee involvement; Autonomous work teams.

Training and Development Strategies :

Creating a learning organization; Competency mapping; Multi-Skilling Succession planning; Cross cultural training.

Unit 3: Performance: Management System and HR Strategies

Performance Evaluation and diverse functions, Characteristics of Different Performance Evaluation systems. Pay for Performance: Economic, psychological and social arguments opposite each other, Striking the Balance: Some Key Issues and Tactics, If not Pay for Performance: Forms, Bases and Distributions of Rewards, How and why you do jobs more exciting and challenging? Job design: Job - enlargement and job- enrichment.

Unit 4: Reward and Compensation Strategies

Performance based pay; Skill based pay; Team based pay Broad banding; Profit sharing; Executive Compensation; Variable pay.

Retrenchment Strategies :

Downsizing; Voluntary retirement schemes (VRS) HR outsourcing; Early retirement plans; Project based employment.

Unit 5: Human Aspects of Strategy Implementation

Behavioral issues in strategy implementation; Matching culture with strategy Human side of mergers and acquisitions; Leadership, power and politics; Employee morale; Personal values and business ethics.

Global HR Strategies:

Introduction to global HR strategies; Developing HR as a value added function.

Prescribed Books:

- 1 Strategic HRM – Jeffery Mello, Thompson publication, NewDelhi.
- 2 Strategic HRM – Charles Greer, Pearson education Asia, NewDelhi.
- 3 Strategic HRM - Michael Armstrong, Kogan page, London.
- 4 Strategic HRM – Agarwal, Oxford university press, NewDelhi.
- 5 Human Resource Management – Garry Dessler, PHI, NewDelhi.

COURSE CODE	MB309D
COURSE TITLE	HR ANALYTICS
COURSE CREDITS	3

Course Description:

With automation of many HR functions and widely dispersed business units, it has become mandatory on the part of organizations to create rich data source. Not only the creation but also effective utilization of HR data, will help organizations in proper HR value creation. HR analytics is about measuring the ROI on Human capital investment and measuring its impact on performance, production, and profitability of the organization. Analytics of workforce (one of the most important asset) of organization will help HR practices to get aligned with the business strategy of the organization, thereby making HR as a strategic Business partner.

Course Objectives:

1. To gain an understanding of the different analytical approaches used by HR Professionals to solve real business problems.
2. To examine actual business cases and apply problem solving and critical thinking skills through group case studies.
3. To build on presentation skills and demonstrate the ability to work effectively in teams.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
309D.1	Remember	DEFINE the key concepts related to HR Analytics, Machine Learning, Cloud Computing & Business Intelligence.
309D.2	Understand	DISCUSS different analytical approaches used by HR Professionals to solve real business problems
309D.3	Apply	MAKE USE OF human resource data in organizations for decision making.
309D.4	Analyze	RELATE HR Analytics with strategy formulation for the actual business cases and problem solving.
309D.5	Evaluate	With the help of HR Analytics, understand and EVALUATE diversity issues and their impact on organization.
309D.6	Create	DEVELOP workforce planning with the effective use of HR Analytics.

Course Outline:

Unit 1: Introduction & Concept

Disruptive Technological Era: Evolution of Industry Revolution 4.0 and aspect of HR, Big data in HR, understanding of Machine Learning, sensors and cloud computing, Business Intelligence in HR.

Unit 2: Importance of HR Analytics

Role and Responsibilities of HR Analytics, Framework of contemporary HR Analytics, - Predictive tools and Applications in solving problems using HR analytics. Gartner's Analytics Maturity Model.

Unit 3: Innovation

Concept of innovation, Kinds of Innovation, Developing Innovative culture in an organization. HR analytics linkage to business outcomes, Measuring use of HR analytics impact on business outcome.

Unit 4: Strategy Formulation

Redefining HR Policies and Practices, Robust competency mapping, understanding future of work and workplace, Decision framework. Use of HR analytics in workforce planning: talent acquisition, talent development, talent compensation, talent engagement and retention.

Unit 5: Learning from Analysis

Case studies and best practices in use of HR Analytics in industry.

Prescribed Books:

1. Winning on HR analytics: Leveraging data for competitive advantage, Ramesh Soundararajan and Kuldeep Singh, Sage Publication.
2. The Practical Guide to HR Analytics: Using Data to Inform, Transform, and Empower HR Decisions Paperback, Shonna D. Waters, Valerie N. Streets, Lindsay Mcfarlane, RachaelJohnson-murray.

Suggested Reading:

1. Human Capital Analytics: How to Harness the Potential of Your Organization's Greatest Asset, Boyce Byerly, Gene Pease, and Jac Fitz-enz.
2. Doing HR Analytics: A Practitioner's Handbook with R Examples, Lyndon, Mr. Sundmar, Createspace Independent Pub.
3. The Power of People: Learn How Successful Organizations Use Workforce Analytics to Improve Business Performance, Guenole Nigel, Ferrar Jonathan, Feinzig Sheri, PearsonPublication.

PHARMA MANAGEMENTSPECIALIZATION

PSO-1: Demonstrate the Proficiency in Pharma Management domain like Pharma Product Management, Pharma Export Management, International Marketing Management, Pharma Advertising and Pharma Management to support the various Business Functions.

PSO-2: To inculcate the ability to gain multidisciplinary knowledge through Case Analysis, Projects-Based Learnings, Internships, Industrial Visits, Corporate Sessions, Desk Research to support the Pharma Management.

COURSE CODE	MB303E
COURSE TITLE	ANATOMY, PHYSIOLOGY AND HEALTH EDUCATION
COURSE CREDITS	3

Course Description :

The course enable healthcare workers, who are not physicians, including medical technicians, emergency medical technicians and physician's assistants as well as paramedical as well as management students and covers all the topics that are expected to confront them.

Course Objectives:

1. To acquire knowledge of the healthy man's anatomy and physiology to be able to plan and implement drug treatment based on scientific based knowledge of the structure and function of the human body.
2. To describe the relationships between structure and function of the human body.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
303E.1	Remember	DEFINE the anatomic terms used to refer to the body in terms of directions and geometric planes.
303E.2	Understand	EXPLAIN the major cavities of the body and the organs they contain.
303E.3	Apply	INTERPRET the role of cell. Describe the major functions of the four types of human tissue.
303E.4	Analyze	CONSTRUCT List the major systems of the body, the organs they contain and the functions of those systems. DISCOVER the terms anatomy and physiology
303E.5	Evaluate	ASSESS the structure and function of the human body
303E.6	Create	FORMULATE Cellular Metabolism; Cell Structure.

Course Contents:

Unit 1: Digestive & Respiratory System

Gross anatomy of the gastro-intestinal tract, functions of its different parts including those of liver, pancreas and gall bladder, various gastrointestinal secretions and their role in the absorption and digestion of food. Disorders of digestive system. Anatomy of respiratory organs & its functions, respiration, mechanism and regulation of respiration, respiratory volumes and vital capacity.

Unit 2 : Central Nervous System & Autonomic Nervous System

Functions of different parts of brain and spinal cord. Neurohumoral transmission in the central nervous system, reflex action electroencephalogram, specialized functions of the brain, Cranial nerves and their functions. Physiology and functions of the autonomic nervous system. Mechanism of neurohumoral transmission in the A.N.S.

Unit 3: Urinary System & Endocrine System

Various parts, structures and functions of the kidney and urinary tract. Physiology of urine formation and acid-base balance. Diseases of the urinary system, Basic anatomy and physiology of Pituitary, Thyroid, Parathyroid. Adrenals, Pancreas, Testes and ovary, their hormones and functions.

Unit 4: Reproductive System & Sense Organs

Male and female reproductive systems and their hormones, physiology of menstruation, coitus and fertilization. Sex differentiation, spermatogenesis & oogenesis. Pregnancy its maintenance and parturition. Basic anatomy and physiology of the eye (vision), ear (hearing), taste buds, nose (smell) and skin (superficial receptors).

Unit 5: Concepts of Health and Disease

Disease causing agents and prevention of disease, Classification of food requirements- Balanced diet, nutritional deficiency disorders, their treatment and prevention, specifications for drinking water, Communicable diseases, First Aid Emergency treatment of shock, snake bites, burns, poisoning, fractures and resuscitation methods.

Prescribed Books:

1. Anatomy Physiology and Health Education (PB 2019) Agrawal R.
2. Anatomy Physiology And Health Education by Murugesh.

Suggested Readings:

1. Human Anatomy, Physiology & Health by Jayaveera K.N. , Vrushabendra Swamy B M.
2. Anatomy Physiology And Health Education by Rahul Phate, 3rd edition

COURSE CODE	MB304E
COURSE TITLE	MANAGEMENT OF MULTINATIONAL PHARMACEUTICALS
COURSE CREDITS	3

Course Description :

In the pharma industry, with added uncertainties from the process of scientific research, project management becomes more challenging. The course provides a combination of the technical know-how of the pharmaceutical industry with the management of key areas in the industry ranging from economic planning to production to International marketing and sales.

Course Objectives:

The basic objective of this course is to acquaint the students with environmental, procedural, institutional and decisional aspects of International Pharmaceutical Marketing done by Multinational Pharma companies.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
304E.1	Remember	DEFINE International environment for Pharmaceutical Exports, Competitiveness of Indian Pharma-products.
304E.2	Understand	EXPLAIN Global market potential for Pharma-products, Organization of supply chain for pharmaceutical export – from producer to port.
304E.3	Apply	INTERPRET Pharmaceutical export zones and special facilities for pharmaceutical exporter, Country risk analysis.
304E.4	Analyze	CONSTRUCT Export promotion schemes for pharma-exports by state and central governments, Export financing.
304E.5	Evaluate	COMPARE Indian and Global multinational management of Pharmaceutical Industries
304E.6	Create	FORMULATE WTO regulations with special reference to pharma products.

Course Contents:

Unit 1: International Business Environment

Concept of Globalisation, its Effects, Benefits & Costs, Multinationals; Firm-specific and location-specific advantages, Role of MNC's in developing countries. Economic, political, legal and cultural environment of International Business, Scenario analysis & country-wide-risks of investments decisions. International Trade Theories- Absolute Advantage Theory, Comparative Cost Theory, Opportunity Cost Theory, Hecksher-Ohlin Theory, Vernon's Theory of International Product Life Cycle.

Unit 2: International Marketing

An overview of the International Marketing Management Process; International Marketing Environment. International Market Segmentation and Positioning; Screening and Selection of Markets; International Market Entry Strategies: Exporting, licensing, Contract Manufacturing, Joint Venture M & A, Setting up of Wholly Owned Subsidiaries Aboard, Strategic Alliances. International business Competitive strategies: Porter's model; Prahalad and Doz's strategy model.

Unit 3: International Product and Pricing Strategies

Meaning, Nature and Importance of International Marketing Orientation: E.P.R.G. – Approach: **Product Designing:** Product Standardization Vs. Adaptation; Managing Product Line, New Product Development; **Pricing for International Markets:** Factors Affecting International Price Determination; Price Quotations and Terms of Sale. Managing International Distribution.

Unit 4: International Promotion and Distribution Strategies

Promotion strategies- Advertising, Personal selling, Sales promotion, Public relations, and Direct marketing, Distribution Channel Strategy – International Distribution Channels, their Roles and Functions; Selection and Management of Overseas Agents; International Distribution Logistics; Planning for Trade Fairs and Exhibitions; International Promotion Mix – Advertising and other Modes of Communication.

Unit 5: Balance of Trade and Balance of Payments

Constituents of Capital Account and Current Account, Reasons and remedies for Adverse Balance of Payment. Convertibility of Capital Account. Theories of Foreign exchange; Role of world bodies like World Bank, IMF, IBRD and WTO in International Trade, Critical issues in trade. Import and Export Policy, Procedure and Documents-Registration of Exporters, Export Quotations, Production and Clearance of Goods for Exports, Shipping and Transportation, Insurance, Negotiation of Documents, Instruments of Payments-Open Account, Bills of Exchange, Letter of Credits-Export Finance.

Prescribed Books:

1. Aswathappa- International Business (Tata McGraw-Hill, 2002).
2. Daniels- International Business (Pearson Education) 2004.
3. Paul J- International Business (Prentice-Hall, 2004).

Suggested Readings:

1. Onkvisit, Sak and Shaw, J.J-International Marketing: Analysis and Strategy (PHI).
2. Deresky H- International Business (PHI, 2003).
3. Hill C W- International Business (Tata McGraw-Hill, 2002).
5. Varma M L- International Trade (Vikas, 2003).
6. Taggart- The Essence of International Business (PHI).
7. Thakur, M., Burton & Gene, E-International Management (Tata McGraw Hill).
8. Hodgetts, R. and Luthens, F-International Management (McGraw Hill Inc 2003).

COURSE CODE	MB305E
COURSE TITLE	BUSINESS LEADERSHIP IN PHARMA
COURSE CREDITS	3

Course Description : Students acquire an understanding appreciation of the need for leadership skills. The capstone activity of the course is the implementation of service-learning project. Throughout the course, students are presented problem-solving situations for which they must apply academic and critical-thinking skills.

Course Objectives:

1. To understand Leadership and what pharma, and device organisations are looking for from leaders.
2. To apply leadership to set your strategic direction and develop your leadership style to higher level.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
305E.1	Remember	FIND out the difference between leading and managing; group co-ordination; interpersonal skills; new strategies for implementing projects; types of leadership style; Identifying the types of Leaders.
305E.2	Understand	EXPLAIN key performance indicators (KPI) to reflect effectiveness of group; stress and conflict management; Lewin's Leadership Styles, The Blake-Mouton Managerial Grid, Path-Goal Theory, Emotional Intelligence Leadership, Flamholtz and Randle's Leadership Style Matrix, Dunham and Pierce's Leadership Model, Transformational Leadership, Charismatic Leadership, Fiedler's Contingency Model, Blue-Ocean Leadership, The Tannenbaum- Schmidt Leadership Continuum - and the list goes on
305E.3	Apply	INTERPRET SWOT analysis; organizing conflictual situations; people management; CAPA (Corrective Action Preventive Action) plans;
305E.4	Analyze	CONSTRUCT Leadership in flat organization; Individual Contributor vs. People Manager as Leader; Potential derailment factors for leadership in pharmaceutical sector
305E.5	Evaluate	CRITICIZE various leadership skills adapted in Pharma Business.
305E.6	Create	FORMULATE Crucibles of leadership; The Leadership Challenge in the Pharmaceutical Sector.

Course Contents:**Unit 1: Introduction**

Meaning, concept, difference between Pharma Leader and Pharma Manager, Trait Perspective of Pharma leadership : Leadership traits and its effectiveness during Pharma management, Leadership style, Behavioral Perspective of leadership, Managerial Grid, Transformational Versus Transactional leadership in Pharma selling.

Unit 2: Leadership Theories applicable to Pharma Industry

Modern Pharma leadership theories, relevance of these theories for today's Pharma organisations, Servant leadership, Charismatic leadership, Authentic leadership, Practicing Moral Leadership Ethics/Morality and Leadership, Modern Views of Leadership.

Unit 3: Change Management and Decision-Making and Pharma Leadership

Pharma Leadership for Sustainability - Power, Influence, Impact - Leadership Practices in Pharma Industry - Organizations and Groups: Organizational Culture and Leadership - Leadership in Business Organizations.

Unit 4: Leading without Formal Authority

Lateral leadership – Meaning, concept, influencing co-workers, higher-ranking managers, or clients of Pharma Industry, develop your leadership brand, Navigate the Pharma organizational hierarchy.

Unit 5: Managing Groups and Teams of Missionary Sales People

Definition and characteristics of group, why do people form and join groups, Theories of group formation, Stages of group development, Group Behaviour: Group Norms, Group cohesion, Group Role, Inter group Conflicts.

Prescribed Books:

1. Northouse, Peter G., Leadership: Theory and Practice, Sage Publications.
2. Daloz Parks, S., Leadership can be taught: A Bold Approach for a Complex World, Boston:Harvard Business School Press.
3. Drucker Foundation (Ed.), Leading Beyond the Walls, San Francisco: Jossey Bass.
4. Al Gini and Ronald M. Green, Virtues of Outstanding Leaders: Leadership and Character, John Wiley & Sons Inc.
5. S Balasubramanian, The Art of Business Leadership – Indian Experiences, Sage Publications

Suggested Readings:

1. Kavita Singh.Organisational Behaviour text and cases.
2. Organisational Behaviour Text and Cases Dr. S.S.Khanka.
3. Understanding organization Behaviour Udai Pareek.

COURSE CODE	MB306E
COURSE TITLE	PHARMA PRODUCT AND BRAND MANAGEMENT
COURSE CREDITS	3

Course Description:

This course defines the principles of the product management system which gives a complete overview of the role of product management in the pharmaceutical industry. In order to increase creativity and efficiency of product managers, the course focuses on strategic planning and profit responsibilities and how to make the product manager familiar with the basic marketing concepts.

Course Objectives:

1. To develop understanding of strategic planning and profit responsibilities.
2. To get understanding of how to familiar with the basic Pharma marketing concepts.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
306E.1	Remember	LIST out various theories, methods & concepts, SHOW the structure and models of Pharma Products and Brands.
306E.2	Understand	UNDERSTAND the role of Pharma marketing strategic concepts & fundamentals of organizational policy process.
306E.3	Apply	APPLY the knowledge, concepts, tools necessary to SOLVE the issues and challenges of marketing in Indian and Global context.
306E.4	Analyze	ANALYZE various brand building decision techniques
306E.5	Evaluate	ASSESS appropriate techniques to promoting Pharma industry performance and MARK on BCG Matrix.
306E.6	Create	IMPROVE the PLC management for internal control.

Course Contents :

Unit 1: Product

Meaning, Classification, Market research and data analysis, product line and product mix decisions, product life cycle, product portfolio analysis; Product strategy and product positioning; New product decisions; packaging and labeling decisions, Product management in pharmaceutical industry, Designing Marketing Programs for New Product launch and Existing Brands; essential constituents, Brand Plans, purpose and benefits, Medical Marketing support, Ad-Agency support and coordination.

Unit 2: Concept of Brand and Brand Equity

What is a Brand: Brand Name, Brand Image, Brand Value and Brand Awareness, Concept of Brand Equity, difference with brand valuation, Five dimensions of Brand Equity, key influencers of each dimension, prescription loyalty, prescriber coverage frequency, brand exposure through field-force promotion, Quality indicators, Promotional-mix, Benefits of building Brand Equity.

Unit 3: Brand Management as a strategic marketing function

Role of a Pharmaceutical Brand Manager, the 'Little CEO' concept, 'Science meets Commerce'

concept; Essential differences between managing Pharmaceutical Brands and Consumer Brands, types of Pharmaceutical Brand Management organization structures, challenges of a Brand Manager; relation of Product Management Teams vis-à-vis Sales Force in Pharmaceutical companies.

Unit 4: Fundamentals of Pharmaceutical Marketing

The 4 'Ps' in a regulated Pharma market, the Strategic Triangle; Market Segmentation in the pharmaceutical context, conceptual difference with consumer products market segmentation, Brand Positioning in the pharmaceutical context, conceptual difference with consumer brand positioning, PLC Management, reinforcing and revitalizing pharmaceutical brands, line-extensions.

Unit 5: Product-mix Optimization & Promotional-mix Optimization

Portfolio Analysis by factoring key determinants, BCG Matrix, brand building decisions; leveraging the Promotional-mix for Brand Building.

Prescribed Books:

- 1 Pharmaceutical Marketing by Mickey C. Smith.
- 2 Pharmaceutical Product Development by N. K. Jain.
- 3 Product Management by Lehman and Winer.

GBSRC MBA Syllabus

COURSE CODE	MB307E
COURSE TITLE	PHARMA SALES, DISTRIBUTION AND RETAIL MANAGEMENT
COURSE CREDITS	3

Course Description:

This course focuses on the Pharma services, how to obtain orders, and establishes new accounts by planning and organizing daily work schedule to call on existing or potential sales outlets and other trade factors. How to adjust content of sales presentations by studying the type of sales outlet or trade factor and also focuses sales efforts by studying existing and potential volume of dealers.

Course Objectives:

1. To study of pharmaceutical sales is different from study of general sales, various factors like physicians behaviour, promotional strategy, marketing reputations of organizations etc.
2. To enable students to understand about selling of medicines and pharmaceutical market dynamic.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
307E.1	Remember	TELL concepts, theories and terms in sales and distribution, retail management in Pharma Industry.
307E.2	Understand	CLASSIFY sales techniques used by the Pharma Industry for business maximization.
307E.3	Apply	DEMONSTRATE sales force management strategies used for designing and organizing sales force as well as retail store of Pharma Industry.
307E.4	Analyze	DISCOVER the impact of cultural factors influence the Pharma Industry sales performance.
307E.5	Evaluate	ASSESS distribution strategy and take corrective action if necessary.
307E.6	Create	DESIGN sales force & channel management strategies for an organization.

Course Contents:

Unit 1: Need and scope of Pharmaceutical selling

Direct selling – concepts & types, Role & responsibility of medical representatives, Physicians degrees & specialties, Hospitals & Institutions – influencing factors for Prescriptions, Practice, pattern wise, Geographically, Modes of CRM, Various departments in a company, their importance, roles of other Sales staff, Role of MRs – in today's Context, needs, challenges, controls, attritions.

Career in different types, size, cultures.

Unit 2: Distribution channel and network in pharmaceutical industry, Distribution Channels: Manufacturer; Wholesaler; Retailer; Hospital and Government Agencies, Undercutting / substockist / Semi wholesaler concept.

Unit 3: -Managing the sales force & Sales forecasting of pharmaceutical products:

Elements & objectives of Pharma sales management, Modern approach to selling, Sales Hierarchy Sales Targets – designing sales territories, allocation of targets, Reviewing sales target, evaluation of Sales programmes, Sales Forecasting, tools and techniques, Launching new territories, Products, Retail Prescription Audit.

Unit 4: Retail Competition: The Community Level; International Marketing, Current needs of the Retailer (a Chemist), customers, threat, fate of Online pharmacy.

Unit 5: -Principal channel relationship

- Channel management decisions, Resolving Channel conflicts - manage & progress.

Prescribed Books:

1. Prahlad, CK and Hart, Stuart L(2002), The Fortune at the Bottom of Pyramid strategy.
2. Jaiswal, anand K, (2008), The fortune at the Bottom or the Middle of the Pyramid? Innovations, 3 (1), 85-10.

GBSRC MBA Syllabus

COURSE CODE	MB308E
COURSE TITLE	PHARMACEUTICAL MANUFACTURING AND REGULATORY AFFAIRS
COURSE CREDITS	3

Course Description:

The Regulatory Affairs function within the pharmaceutical industry is absolutely pivotal to the successful development and licensing of safe and effective medicines, to the benefit of patients' health worldwide. The course focuses on a winning combination of lectures and interactive case studies that afford you the opportunity to put theory into practice.

Course Objectives:

1. To understand all draft amendments of primary legislations dealing in drugs namely, Drugs and Cosmetic Act, and offer suggestions to the Drugs Controller - General (India), Government of India, New Delhi.
2. To understand the management of the regulatory activities necessary to bring drugs and medical products to market.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
308E.1	Remember	DEFINE the management of all lifecycle activities (regulatory and marketing) of a medicine and manufacturing.
308E.2	Understand	DEMONSTRATE the pertinent issues involved in the undertaking of clinical research and the regulation of medicines in the various global and domestic pharma markets.
308E.3	Apply	IDENTIFY the principal steps in drug discovery and APPLY the knowledge related to Pharma Industry.
308E.4	Analyze	ANALYZE the principles of health economics and their application in the development and marketing of medicines.
308E.5	Evaluate	EVALUATE the management of drug safety issues pre- and post-marketing authorization for development and DECIDE the product-related information to ensure adherence to ethical and legal provisions.
308E.6	Create	DEVELOP the complete development plan (pharmaceutical, non-clinical and clinical) according to the proposed therapeutic indication.

Course Contents:

Unit 1: Historical perspective on the impact of Food and Drug laws, Drug regulatory and accrediting agencies of the world (USFDA, TGA, ICH, WHO, ISO etc.).

Unit2: Globalization of drug industry, present status and scope of pharmaceutical industry in India. WHO and NABL certification, ICH guidelines for manufacturing and quality assurance of drug

formulation.

Unit 3: Manufacturing: Introduction, regulatory requirements as per Indian and other regulatory authorities for manufacturing information formula, process, validation of manufacturing process, equipment, documentation, inspection requirement, regulatory guidelines for active ingredients and formulations.

Unit 4: Manufacture of and controls on dosage forms: Manufacturing documents, master formula, batch formula records, standard operating procedures, quality audits of manufacturing processes and facilities. In process quality controls on various dosage forms; sterile and non– sterile, standard operating procedures for various operations like cleaning, filling, drying, compression, coating, disinfections, sterilization, membrane filtration etc.,

Unit 5: Regulatory guidelines for packaging materials, test and evaluation of packaging materials, biological test, microbiological test and evaluation of closures.

Prescribed Books:

1. Guidelines for Developing National Drug Policies; WHO Publications, 1998.
2. Quality Assurance of Pharmaceuticals–A Compendium of Guidelines and Related Materials, Vol. –1; WHO Publications.
3. GMP by Mehra.
4. How to Practice GMP by P.P. Sharma.
5. Good Manufacturing Practices for Pharmaceuticals-A Plan for Total Quality Control by Sidney H. Willing and James R Stoker. (Drugs and Pharm. Sciences) Vol. 78; Marcel Dekker Inc.
6. Current good manufacturing practices for pharmaceuticals by Manohar A.Potdar.

GBSRC MBASyllabus

COURSE CODE	MB309E
COURSE TITLE	PHARMACEUTICAL MANAGEMENT INFORMATION SYSTEM
COURSE CREDITS	3

Course Description: The pharmacy management system, also known as the pharmacy information system, is a system that stores data and enables functionality that organizes and helps staff at all levels of a country's health system make evidence-based decisions to manage pharmaceutical services. An effective pharmaceutical management information system (PMIS) can synthesize the large volume of data generated by pharmaceutical management operations. Managers integrate manual and electronic tools into a comprehensive strategy to strengthen pharmaceutical systems. A good PMIS provides the necessary information to make sound decisions in the pharmaceutical sector.

Course Objectives:

1. To learn concepts of the learn principles, objectives, applications and design of PMIS.
2. To learn the types of PMIS designed for different needs of the Pharmaceutical organizations.
3. To learn the technological updates in Information systems making the decision making process more easy and sophisticated for Pharmaceutical companies globally as well.
4. To learn the Business Applications of Pharmaceutical Management Information Systems.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
309E.1	Remember	DEFINE the MIS; functions of PMIS in pharma industry; data and information.
309E.2	Understand	EXPLAIN PMIS record keeping documents; Data Compilation tools; information stages; data reporting forms; feed-back reports.
309E.3	Apply	INTERPRET using the electronic dispensing tool to manage pharmaceutical information at different health care system.
309E.4	Analyze	CONSTRUCT key issues in designing or revising PMIS.
309E.5	Evaluate	SELECT an appropriate data analysis and tools for the given business problem or situation or ASSESS ERP.
309E.6	Create	FORMULATE implementation of PMIS.

Course Outline:

Unit 1: Introduction to Pharmaceutical Management Information Systems (PMIS)

Definition of a Pharmaceutical Management information system (PMIS) , Functions of PMIS, Nature of PMIS, Scope of PMIS, Objectives of PMIS, Importance of PMIS, Limitations of PMIS, Role of MIS in Business functions and Pharma organizations Operating Elements of PMIS, Information Systems Pyramid Structure Based and Management Activity Based role of PMIS, PMIS Structure Based on Organizational Function, Advantages and Disadvantages.

Unit 2: Classification of Pharmaceutical Information Systems

Types of PMIS, Typical components of a PMIS, Record- keeping documents, Data compilation/aggregation tools, Data-reporting forms, feedback reports.

Unit 3: Decision Making Process- Types and Models

Steps in designing or revising PMIS, implementation of a PMIS, processing data, presenting information, Interpreting information and taking action.

Unit 4: Concepts of Information

Types of Information, concept/Roles/Advantages/Disadvantages, Types of telecommunications networks, concept/Methods/Need/Methods of Defence Networks and Website, Information Security and Cyber security in Pharmaceutical industry, Role and Importance of general technological knowledge in Pharma industry.

Unit 5: ERP- Enterprise Resource planning in Pharmaceutical Industry

Evolution of ERP, what is ERP? Reasons for the Growth of ERP, Scenario and Justification of ERP in India, Evaluation of ERP, Various Modules of ERP, Advantage of ERP, Future Directions of ERP, New markets, new channels, faster Implementation Methodologies, ERP and related Technologies; Business Process Reengineering (BPR), Management Information System (MIS), Executive Information System(EIS), Decision Support System (DSS), Supply Chain management (SCM).

Prescribed Book:

1. Introduction to Information Systems- James A O'brien.
2. Management Information Systems- Gorden B. Davis & Margretthe H.Olson.

Suggested Readings:

1. Management Information Systems-Dharminder Kumar and Sangeeta Gupta.
2. Management Information Systems in Knowlwdge Economy- Joseph S. J. Mahapatra.
3. Fundamentals of Computers- Peter Norton.

BIOTECH AND BIOINFORMATICS MANAGEMENT SPECIALIZATION

PSO-1: Demonstrate the Capability in Biotechnology Management domain like Immunology, Computational Biology & Bioinformatics, IPR & Technology Transfer in Biotechnology, Food Technology & Nanotechnology to optimally solve the business problems.

PSO-2: To inculcate the ability to gain multidisciplinary knowledge through Case Analysis, Projects-Based Learnings and Internships, Industrial Visits, Corporate Sessions to support the Biotech & various Bioinformatics Functions.

COURSE CODE	MB303F
COURSE TITLE	PRINCIPLES OF IMMUNOLOGY
COURSE CREDITS	3

Course Description:

This course includes detailed description of the immune response made in humans to foreign antigens including microbial pathogens. A description of cells involved in the immune response either innate or acquired. Other topics covered will include the genetic basis of diversity of immune responses in mammals. Role of the Vaccines and importance of Vaccination.

Course Objectives:

1. To promote critical thinking among students.
2. To provide students with a foundation in immunological processes.
3. To provide students with knowledge on how the immune system works building on their previous knowledge from biochemistry, genetics, cell biology and microbiology.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
303F.1	Remembering	Memorize the different components of mammalian immune system and their role along with T lymphocytes and B lymphocytes
303F.2	Understanding	Understand the mutation, transcription and antibodies in detail
303F.3	Applying	Use the antigen-antibody information to understand different commercial immuno techniques like ELISA
303F.4	Analysing	Differentiate between different types of vaccines and examine the importance of immunization
303F.5	Evaluating	SELECT the auto immune diseases, its mechanism and therapies available for the same
303F.6	Creating	Develop the systematic plan against diseases

Course Outline:

Unit 1: Immune Response

An overview, components of mammalian immune system, molecular structure of Immunoglobulins or Antibodies, Humoral & Cellular immune responses, T lymphocytes & immune response (cytotoxic T-cell, helper T-cell, suppressor T-cells), T-cell receptors, genome rearrangements during B-lymphocyte differentiation, Antibody affinity maturation class switching, assembly of T-cell receptor genes by somatic recombination.

Unit 2: Regulation of Immunoglobulin Gene Expression

Clonal selection theory, all types & idiotypes, allelic exclusion, immunologic memory, heavy chain gene transcription, genetic basis of antibody diversity, hypotheses (germ line & somatic mutation), antibody diversity, alternate pathways of transcript splicing, variable joining sites & somatic mutation, role of antibody (alone, in complement activation & with effector cells), monoclonal antibodies.

Unit 3: Major Histocompatibility Complexes

Class I & class II MHC antigens, antigen processing. **Immunity to infection** – Immunity to different organisms, pathogen defense strategies, avoidance of recognition, inactivation of host-immune effector mechanisms. **Immuno-techniques** - Blood grouping, Antigen-Antibody reactions: agglutination, precipitation, Immuno-electrophoresis, Coomb's test, ELISA, RIA.

Unit 4: Vaccines and Vaccination

Adjuvants, cytokines, DNA vaccines, recombinant vaccines, bacterial Vaccines, viral vaccines, vaccines to other infectious agents, tumor vaccines, principles of vaccination, passive & active immunization, immunization programs & role of WHO in immunization programs.

Unit 5: Auto-Immune Diseases

Autoimmunity & auto-immune diseases, factors contributing development of auto-immune diseases, mechanism of development, breakdown of self-tolerance, rejection of transplants, molecular mimicry, diagnosis & treatment of auto-immune diseases, replacement therapy, suppression of autoimmune processes, nature of auto-antigens, immunodeficiency, AIDS. Immune Response of Plants.

Prescribed Books:

1. Essentials of Immunology, Arya Publication, by S.K. Gupta.
2. Immunobiology, 6th edition by Janis Kuby.

Suggested Readings:

1. Textbook of Microbiology & Immunology, Elsevier India, 2009 by Parija.
2. Basic Immunology: Functions and Disorders of the Immune System, 6e: SAE, by Abul K. Abbas Andrew H. Lichtman, Shiv Pillai.

COURSE CODE	MB304F
COURSE TITLE	COMPUTATIONAL BIOLOGY & BIO-INFORMATICS
COURSE CREDITS	3

Course Description:

This course is an introduction to computational biology emphasizing the fundamentals of nucleic acid and protein sequence and structural analysis; it also includes an introduction to the analysis of complex biological systems. Topics covered in the course include principles and methods used for sequence alignment, motif finding, structural modeling, structure prediction and network modeling, as well as currently emerging research areas.

Course Objectives:

1. Aims to equip students with basic computational and bioinformatics skill.
2. To acquire advanced computational and modelling skills required to address problems of life sciences for computational perspective.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
304F.1	Remembering	RELATE the genome sequencing, its experimental approach and genome information resources
304F.2	Understanding	UNDERSTAND protein sequencing, its structural importance and protein information resources
304F.3	Applying	Use of different data bases in biological data analysis
304F.4	Analysing	COMPARE different types of sequence alignment techniques using BLAST and FASTA algorithm
304F.5	Evaluating	Evaluate the importance of structural data bases and protein data bank
304F.6	Creating	CREATE Structural Databases

Course Outline:

Unit 1: Introduction to Genomics

Information flow in biology, DNA sequence data, Experimental approach to genome sequence data, genome information resources.

Unit 2: Functional Proteomics

Protein sequence and structural data, protein information resources and secondary data bases.

Unit 3: Computational Genomics

Internet basics, biological data analysis and application, sequence data bases, NCBI model, file format.

Unit 4: Sequence Alignment & Data Base Search

Protein primary sequence analysis, DNA sequence analysis, pair wise sequence alignment, FASTA algorithm, BLAST, multiple sequence alignment, DATA base searching using BLAST and FASTA.

Unit 5:Structural Data Bases

Small molecules data bases, protein information resources, protein data bank.

Prescribed Books:

1. Fundamentals of Bioinformatics and Computational Biology, Methods and Exercises in MATLAB, by Singh, Gautam B.
2. Introduction to Bioinformatics Algorithms by Neil Jones and Pavel Pevzner.

Suggested Readings:

1. Bioinformatics by David Mount (2nd edition).
2. Introduction to Bioinformatics: A Theoretical and Practical Approach, by: Stephen A. Krawetz, David D. Womble, May 2003, Publisher: Humana Press, May 2003.

GBSRC MBA Syllabus

COURSE CODE	MB305F
COURSE TITLE	INTELLECTUAL PROPERTY RIGHTS & TECHNOLOGY TRANSFER IN BIOTECHNOLOGY
COURSE CREDITS	3

Course Description:

Course involves basic concepts of Intellectual Properties, Intellectual property Rights, applications, advantages, Government rules and regulations for the same. Major issues concerned to the field of Biotechnology like Biosafety and GMO etc.

Course Objectives:

1. Develop fundamental understanding Intellectual properties and IPR in Biotechnology.
2. Understand the applications and advantages of IPR in biotech industry.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
305F.1	Remembering	DEFINE the concept of Intellectual property and different types of it
305F.2	Understanding	EXPLAIN evolution of patent laws at Indian and International level
305F.3	Applying	DEMONSTRATE different categories and classification of patents
305F.4	Analysing	INTERPRET duties and rights of patent holder and biosafety measures for plants
305F.5	Evaluating	ANALYSE different International regulatory bodies and regulations for permit of GMOs
305F.6	Creating	CONSTRUCT various regulatory bodies.

Course Outline:

Unit1: Introduction to Intellectual Property Rights

Concept of IPR, Designs, Trademarks TM, Trade Secret (TS), Domain Names, Geographical Indications, Copyright.

Unit 2: History and Evolution of Patent Law

Evolution of patent Laws, History of Indian Patent System, International Conventions and Treaties, Patent Laws in other countries.

Unit 3: Classification of Patents

Classification of patents in India, Classification of patents by WIPO, Categories of Patent, Special Patents, Patenting Biological products, Classification of patents, Classification of patents in India, Classification of patents by WIPO, Categories of Patent, Special Patents, Patenting Biological products.

Unit 4: Patent Owner

Rights and Duties Ownership of patent, Rights of patent holder and co-owners, Duties of patent

holder and co-owners, Transfer of patent Rights, Limitations of patent Rights, Restoration of Patents, Infringement of patent Rights and Offences, Actions against Infringement: Remedies/Relief, Patent Agent.

Protection of plant varieties and Farmers' Right Acts, Methods of protection of plant and plant products, Essentialities of plant protection, Plant variety protection and Farmers' Right Act, UPOV convention (plant Varieties) 1961. **Introduction to biosafety:** Overview of biosafety, Risk assessment, Cartagena protocol on Biosafety, GMOs: Concerns and challenges transgenic technology, Gene flow, Future opportunities and challenges.

Unit 5: International Regulatory Bodies

National regulatory bodies, Biosafety of Genetically engineered products, Genetically engineered products and recombinant DNA technology, Risk assessment of RDT products, Regulating recombinant DNA technology, Permit for movement and import of GMOs, Web based information of biosafety on GMO, Biosafety database Good Laboratory biosafety practices Importance of good laboratory practices, General good laboratory practices.

Prescribed Books:

1. Singh K., Intellectual Property Rights on Biotechnology, BCIL, New Delhi.
2. IPR, Biosafety and Bioethics by Deepa Goel and Shomini Parashar, Pearson publisher.
3. Basics of Patenting published by GTU.

Suggested Readings:

1. Biotechnology in the Welfare of Mankind – Ali Khan.
2. Sasson A., Biotechnologies in developing countries present and future, UNESCO Publishers, 1993 Biotechnology and Genomics, P.K. Gupta, Rastogi Publications.
3. Ganguli Prabuddha “Geographical Indications--its evolving contours” accessible in http://iips.nmims.edu/files/2012/05/main_book.pdf (2009).
4. Inventing the Future: An introduction to Patents for small and medium sized Enterprises; WIPO publication No. 917. URL: www.wipo.int/ebookshop.

COURSE CODE	MB306F
COURSE TITLE	FOOD TECHNOLOGY AND FUNDAMENTALS OF PRODUCTION PLANNING
COURSE CREDITS	3

Course Description:

Biotechnology is a knowledge-intensive industry, it is expected that India will have a competitive advantage and will be able to make full use of this opportunity as has been the case with the IT industry. This course is beneficial to the students who want to make their carrier in biotechnology industry.

Course Objectives:

1. To familiarize the students with the fundamentals of production planning.
2. To gain knowledge of Fermentation process and various fermented products.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
306F.1	Remebering	Students will be able to ILLUSTRATE the fermentation process
306F.2	Understanding	Students will be able to CONSTRUCT Fermenter Designing and get detailed information on commercial fermented products.
306F.3	Applying	Students will be able to DEMONSTRATE the understanding of quality control measures and policies in biotechnology and drug manufacturing.
306F.4	Analysing	CLASSIFY the whey, mollasses, starch.
306F.5	Evaluating	DETERMINE the QCM techniques
306F.6	Creating	COMBINE Food Preservation Techniques

Course Contents:

Unit 1: Biotechnology in Food Processing

Unit Operation in Food Processing, Quality Factors in processed Food, Food deterioration and its control, Rheology of Food products.

Unit 2: Design of Food Preservation Equipments

General engineering aspects and processing methods, types of equipments and their design: Refrigerator, freezer, dryer, calculation of pasteurization time, time and temperature calculation for HTST sterilization, Design principles of bioreactors, Procurement of material: Material for construction of bioreactors and selection criteria.

Unit 3: Molecular methods and Production

Methods and application of molecular cloning in foods Developmental technique for new plant varieties.

Unit 4: Modification and Bioconversion of food raw materials

Bioconversion of whey, molasses and starch and other food waste for value addition.

Unit 5: Quality control management in Biotechnology, General introduction about drugs manufacturing process and policies, Standard operating procedures, Quality control and quality assurance.

Prescribed Books:

1. Process Equipment Design, M. V. Joshi. Mc MillanIndia.
2. Process Equipment Design. S. D. Dawande, Dennet andCompany.
3. Process equipment design by L.E. Brownell and E. Young, John Wiley, New York, 1963.

GBSRC MBA Syllabus

COURSE CODE	MB307F
COURSE TITLE	ETHICS, BIOSAFETY AND HAZARD MANAGEMENT IN BIOTECHNOLOGY
COURSE CREDITS	3

Course Description:

From the promise of a world without hunger to the possibility to choosing our children's traits, genetic engineering is revolutionizing agriculture, industry, and medicine in the 21st century, transforming our food supply and changing the way we think about health and disease. This course examines biotechnology and genetic engineering in historical, social, political, and ethical contexts.

Course Objectives:

1. To gain familiarity with bioethical approaches and learn to apply them to the issues raised by biotech.
2. To understand what is meant by "The social construction of technology".
3. To make students learn about the legal, safety and public policy issues raised due to the rapid progress in Biotechnology and development of new products.
4. To understand the regulatory framework important for the product safety and benefit for the society.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
307F.1	Remebering	Students will be able to DESCRIBE the regulatory framework important for the product safety and benefit for the society.
307F.2	Understanding	Students will be able to EXPLAIN the basic issues of Biosafety, Bioethics and IPR and implement in future policy making.
307F.3	Applying	Students will be able to CATEGORIZE case history to discuss and express their views.
307F.4	Analysing	Students will be able to DISTINGUISH IPR as per applicability
307F.5	Evaluating	Students will be able to CHOOSE patenting ideas
307F.6	Creating	Students will be able to COMBINE best practices in Bioethics

Course Contents:

Unit 1: Biosafety

Introduction and Development of Biosafety Practices, Principles General lab requirements
Definitions and Biosafety levels: 1, 2, 3, 4.

Unit 2: Summery Biological safety cabinets

Centrifuges, Shipment of biological specimens, Biological waste management, Decontamination, Biosafety manuals, Medical surveillance, Emergency response.

Unit 3: Bioethics

History and Introduction Ethics and genetic engineering Genetic Privacy Patent of genes Human races Trading Human Life Human Cloning Stem Cells Eugenics Biotechnology and Christian faith

Human genome and religious considerations Case Studies Final Considerations.

Unit 4: Intellectual Property Rights

Introduction Types of Intellectual Property Rights Plant and Animal growers rights Patents Trade secrets, Copyrights, Trademarks IPR and plant genetic resources.

Unit 5: Patenting

Patenting of biological materials International conventions and cooperation Current Issues Patents for higher animal and higher plants Patenting of transgenic organisms and isolated genes Patenting of genes and DNA sequences Indian scenario.

Prescribed Books:

1. Bioethics and Biosafety, 1/e- M K Sateesh- I.K. International Publication house Pvt.Ltd.
2. Biosafety and Bioethics Varsha Gupta, Manjitha Sengupta, Jaya Prakash, Baishnab Charan Tripathy- Springerpublication.

GBSRC MBA Syllabus

COURSE CODE	MB308F
COURSE TITLE	ENVIRONMENTAL BIOTECHNOLOGY AND ENVIRONMENT MANAGEMENT
COURSE CREDITS	3

Course Description:

It seeks to provide education and training, empower students with technical skill-set, create capacities and build career opportunities in three key domains of biotechnology namely: Research and development, Science education and Policy, regulations and management.

Course Objectives:

1. To familiarize the students with the working of Biotechnology plant management in Biotechnology sector.
2. To advance education and research in Biotechnology and explore sustainable solutions for agriculture, environment and energy sectors.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
308F.1	Remebering	Students will be able to UNDERSTAND the basic requirements in the Biotechnology Plant, fermentation process and some fermented products.
308F.2	Understanding	Students will be able to DEMONSTRATE and choose the sustainable solutions for agriculture, environment and energy sectors.
308F.3	Applying	Students will be able to CONSTRUCT a path towards Waste water management
308F.4	Analysing	Students will be able to ANALYZE degradation of xenobiotics and Bioremediation
308F.5	Evaluating	Students will be able to ANALYZE degradation of xenobiotics and Bioremediation
308F.6	Creating	Students will be able to DESIGN Industrial waste waters and Pollution Control

Course Contents:

Unit 1: Environmental Pollution

Global warming Depletion of ozone layer, Types of Pollution Water pollution, Soil Pollution, Air Pollution, Noise Pollution Sources of pollution.

Unit 2: Air pollution and its control, Active trace gases in air Aerosols in air Control of air pollution through biotechnology.

Unit 3: Waste water management

Domestic and industrial wastewater, types, sources and effects of water pollutants, Waste water characteristics, Aerobic System Biological processes for domestic and industrial waste water treatments; Aerobic systems - activated sludge process, trickling filters, biological filters, rotating biological contractors (RBC), Fluidized bed reactor (FBR), expanded bed reactor, Inverse fluidized bed biofilm reactor (IFBBR) packed bed reactors air- sparged reactors. Anaerobic System Anaerobic biological treatment.

Unit 4: Microbiology of degradation of xenobiotics and Bioremediation

Xenobiotics in environment Decay behavior of xenobiotics, constraints and priorities of Bioremediation.

Unit 5: Industrial waste waters and Pollution Control

Governing bodies, Policies and Amendments, disposal standards; Treatment of industrial effluents: neutralization, proportioning, effluent sampling and characterization, treatment strategies and disposal standards for different industries: paper and pulp, sugar, distillery, textile, tannery.

Prescribed Books:

1. Biotechnology:PlantHealthManagementHardcover–byNeetaSharma(Author), H. Singh.
2. Handbook of Environmental Biotechnology- 2010th Edition- by Lawrence K. Wang.
3. Plant Biotechnology and its Applications in Tissue Culture, Ashwani Kumar.

GBSRC MBA Syllabus

COURSE CODE	MB309F
COURSE TITLE	FUNDAMENTALS OF NANOTECHNOLOGY
COURSE CREDITS	3

Course Description:

This course is introducing some of the fundamental principles behind nanotechnology and nanomaterials, as well as applications of nanotechnology. The objective of the course is to familiarize the students with the tools and techniques in nanotechnology and nanomaterials. By the end of the course, students will understand the emerging nanotechnologies by providing interdisciplinary scientific knowledge.

Course Objectives:

1. To introduce students with basic concepts of nanotechnology.
2. To learn about exciting applications of nanotechnology at the leading edge of scientific research.
3. To familiarize the students with the tools and techniques in nanotechnology.
4. To gain knowledge in the field of nanobiotechnology and its application in industries.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
309F.1	Remembering	DEFINE nanotechnology and state its prospects
309F.2	Understanding	EXPLAIN different types of nanodevices and electronic devices
309F.3	Applying	CONSTRUCT different types of biological machines in bio nanotechnology
309F.4	Analysing	EXAMINE impact of nanotechnology on different aspects like energy, health, environment etc
309F.5	Evaluating	INTERPRET the applications of nanotechnology in various fields
309F.6	Creating	BUILD proper channels for combining Nanotechnological tools.

Course Outline:

Unit 1: Introduction to nanotech, Definition & Concept, Concept system for nanotech, history, Future prospects and Career opportunities of nanotechnology.

Unit 2: Introduction to nanodevices, Electronic devices- Ballistic transport, depletion layers, spintronics (magnetic devices) Ultrasensitive magnetic Sensors, Spin dependent transistors, photonic devices, Mechanical devices, Fluidic devices, Mixers and Reactors.

Unit 3: Introduction to bio nanotechnology, Concept & definition, Mechanism of biological machines -Biological motors, Microtubule, Assembly and Disassembly. Cost of control, DNA as construction material, Biosensors.

Unit 4: Impact of nanotechnology -Scientific Impact, Technical impact- information technology, energy, health, Commercial impact, environmental impact, impact on individual's psychology.

Unit 5: Applications of nanotechnology in Biotechnology, Nanotech in Modern animal Biotech, Nanotechnology in agriculture and food industry, Nanotechnology in cosmetics, Nanotechnology

in tissue engineering, Nanotechnology applied in bioinformatics, Nanotechnology & information technology, environmental nanotechnology, Nanotechnology in Manufacturing, Renewable energy generation, drug delivery, Nanotechnology Health risk, Nanotechnology- Ethics, Regulation of Nanotechnology.

Prescribed Books:

1. Introduction to Nanotechnology 1, Shipra Mital Gupta, Risal Singh.
2. Introduction to Nanoscience and Nanotechnology by Chattopadhyay K K.
3. Introduction to Nanotechnology by Poole C P and Owens F J, WILEY INDIA.
4. Textbook of Nanoscience and Nanotechnology by B S Murthy, Universities press.

Suggested Readings:

1. Nanotechnology: Principles and Practices by Sulabha K Kulkarni
2. Introduction to Nanoscience and Nanotechnology by Gabor L Hornyak and H F Tibbals
3. David E. Reisner. 2009. Bio nanotechnology: Global Prospects. CRC Press.
4. Gabor L. Hornyak, John J. Moore, Tibbals HF., Joydeep Dutta. 2008. Fundamentals of Nanotechnology. CRC Press.
5. Jesus M. de la Fuente, V. Grazu. 2012. Nanobiotechnology: Inorganic nanoparticles Vs Organic nanoparticles. Elsevier.
6. Yubing Xie. 2012. The Nanobiotechnology Handbook. CRC Press.

GBSRC MBA Syllabus

INFORMATION TECHNOLOGY AND SYSTEMS MANAGEMENT SPECIALIZATION

PSO-1: Demonstrate the Proficiency in IT and Systems Management domain like E-Commerce and E-Business Management, ERP, Software Project Management, Applications in different functions like Marketing and Operations and Supply Chain Management to support the various Business Functions.

PSO-2: To inculcate the ability to gain multidisciplinary knowledge through Case Analysis, Projects-Based Learnings, Internships, Industrial Visits, Corporate Sessions, Desk Research to support the IT and Systems Management.

COURSE CODE	MB303G
COURSE TITLE	CLOUD COMPUTING
COURSE CREDITS	3

Course Description:

This course provides a hands-on comprehensive study of Cloud concepts and capabilities across the various Cloud service models including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), and Business Process as a Service (BPaaS). Mainstream Cloud infrastructure services and related vendor solutions are also covered in detail. The course also covers the Cloud security model and associated challenges and delves into the implementation and support of High Performance Computing and Big Data support capabilities on the Cloud.

Course Objectives:

1. To learn various aspects such as services, infrastructure and addressing of security concern involved in Cloud Computing.
2. To understand the students an insight into the basics of cloud computing along with virtualization, cloud computing is one of the fastest growing domain from a while now. It will provide the students basic understanding about cloud and virtualization along with it how one can migrate over it.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
303G.1	Remembering	DESCRIBE the major concepts Centralized and Distributed Computing, Overview of Distributed Computing, Cluster computing, Grid computing. Technologies for Network-based systems- System models for Distributed and cloud computing- Software environments for distributed systems and clouds.
303G.2	Understanding	EXPLAIN Cloud Computing, Cloud issues and challenges, Properties, Service models, Deployment models. Cloud resources: Network and API, Virtual and Physical computational resources, Data-storage. Virtualization concepts, Types of Virtualizations- Introduction to Various Hypervisors, High Availability (HA)/Disaster Recovery (DR) using Virtualization, Moving VMs.

303G.3	Applying	INTERPRET Infrastructure as a Service (IaaS) – Resource Virtualization: Server, Storage, Network, Case studies. Platform as a Service, Cloud platform & Management: Computation, Storage, Case studies. Software as a Service, Web services, Web 2.0, Web OS.
303G.4	Analysing	CONSTRUCT Cloud Programming and Software Environments, Parallel and Distributed Programming paradigms, Current technologies, Programming support of App Engines, Emerging Cloud software Environment.
303G.5	Evaluating	FORMULATE Cloud Access, authentication, authorization and accounting, Cloud Provenance and meta-data, Cloud Reliability and fault-tolerance, Cloud Security, privacy, policy and compliance, Cloud federation, interoperability and standards.

Course Outline:

Unit 1: Introduction

History of Centralized and Distributed Computing – Overview of Distributed Computing, Cluster computing, Grid computing. Technologies for Network-based systems- System models for Distributed and cloud computing- Software environments for distributed systems and clouds.

Unit 2: Virtualization

Introduction to Cloud Computing- Cloud issues and challenges – Properties – Characteristics – Service models, Deployment models. Cloud resources: Network and API – Virtual and Physical computational resources – Data-storage. Virtualization concepts – Types of Virtualization- Introduction to Various Hypervisors – High Availability (HA)/Disaster Recovery (DR) using Virtualization, Moving VMs.

Unit 3: Service Models

Infrastructure as a Service (IaaS) – Resource Virtualization: Server, Storage, Network – Case studies. Platform as a Service (PaaS) – Cloud platform & Management: Computation, Storage – Case studies. Software as a Service (SaaS) – Web services – Web 2.0 – Web OS – Case studies – Anything as a service (XaaS) – Micro services.

Unit 4: Cloud Programming and Software Environments

Cloud Programming and Software Environments – Parallel and Distributed Programming paradigms – Current technologies – Programming support of App Engines – Emerging Cloud software Environment.

Unit 5: Cloud Access

Authentication, authorization and accounting – Cloud Provenance and meta-data – Cloud Reliability and fault-tolerance – Cloud Security, privacy, policy and compliance- Cloud federation, interoperability and standards.

Prescribed Books:

1. Anthony T Velte, Toby J Velte, Robert Elsenpeter, (2009), Cloud Computing a practical approach, 1st Edition, Tata McGraw –HILL.

2. Michael Miller, (2009), Cloud Computing - Web Based application, 1st Edition, Pearson Education.
3. Judith Hurwitz, Bloor Robin, Marcia Kaufman & Fern Halper. (2009), Cloud Computing for Dummies.1st Edition, Wiley.

Suggested Readings:

1. David S. Linthicum, (2009), Cloud Computing and SOA Convergence in Your Enterprise, 1st Edition, Addison Wesley.
2. Dan Kusnetzky, (2011). Virtualization: A Manager's Guide, 1st Edition, O'Reilly
Barrie Sosinsky, (2011), Cloud Computing Bible, 1st Edition, Wiley India PvtLtd

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COURSE CODE	MB304G
COURSE TITLE	SOFTWARE QUALITY MANAGEMENT
COURSE CREDITS	3

Course Description:

The aim and objective of this course is to teach students the concepts and skills needed for SQA and its management. Software quality assurance (SQA or simply QA) is viewed as an activity that runs through the entire development process. It encompasses activities and related techniques to ensure the implementation of appropriate functionality that satisfy the requirements/needs of its targeted client/users for the intended software system, product, or service as the case may be, both correctly and efficiently.

Course Objectives:

1. Understand the basic tenets of software quality and quality factors.
2. Understand general concepts about quality, quality assurance (QA), and software quality management.
3. Choose appropriate testing strategies.
4. Understand how to detect, classify, prevent and remove defects.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
304G.1	Remember	DEFINE various concepts, models, metrics of Software Quality Assurance.
304G.2	Understand	EXPLAIN Software Quality management and Defect Prevention management with respect to Software Quality Assurance.
304G.3	Apply	MAKE USE OF Software Quality Assurance Metrics in software quality programs.
304G.4	Analyze	EXAMINE Software Quality Assurance Standardization, Capability Maturity Model and the Role of SQA in Software Development.
304G.5	Evaluate	APPRAISE various levels of SEI, ISO 9000 Model and its effectiveness in a Business Organisation.
304G.6	Create	INVESTIGATE Future Trends in SQA including PSP – TSP – CMMI – OO Methodology.

Course Outline:

Unit 1 Fundamentals of Software Quality Assurance

The Role of SQA, SQA Plan, SQA considerations, SQA people, Quality Management, Software Configuration Management.

Unit 2 Managing Software Quality

Managing Software Organizations – Managing Software Quality - Defect Prevention –Software Quality Assurance Management.

Unit 3 Software Quality Assurance Metrics

Software Quality – Total Quality Management (TQM) – Quality Metrics – Software Quality Metrics Analysis Software Quality Program -Software Quality Program Concepts – Establishment of a Software Quality Program –Software Quality Assurance Planning – An Overview – Purpose & Scope.

Unit 4 Software Quality Assurance Standardization

Software Standards–ISO 9000 Quality System Standards - Capability Maturity Model and the Role of SQA in Software Development Maturity – SEI CMM Level 5 – Comparison of ISO 9000 Model with SEI's CMM.

Unit 5 Future Trends

PSP – TSP – CMMI – OO Methodology – Clean Room Software, Engineering – Defect Injection and Prevention.

Prescribed Books:

1. Gordon G Schulmeyer, (2007). Handbook of Software Quality Assurance, 4th Edition, ArtechHouse.
2. Nina S Godbole, (2004).Software Quality Assurance: Principles and Practice, 1st Edition, Alpha Science International Ltd.

Suggested Readings:

1. Daniel Galin, (2008). Software Quality Assurance: From Theory to Implementation, 1st Edition, Pearson Education.
2. Jeff Tian, (2005). Software Quality Engineering: Testing, Quality Assurance, and Quantifiable Improvement, Wiley-Blackwell.

COURSE CODE	MB305G
COURSE TITLE	E BUSINESS AND BUSINESS INTELLIGENCE
COURSE CREDITS	3

Course Description:

The course gives an overview of how business intelligence technologies can support decision making across any number of business sectors. These technologies have had a profound impact on corporate strategy, performance, and competitiveness and broadly encompass decision support systems, business intelligence systems, and visual analytics.

Course Objectives:

1. To appreciate e-Business as a significant business segment of the future.
2. To develop capacity to initiate/lead an e-business venture/ business segment.
3. To understand principles of BI and Analytics at conceptual level.
4. To develop skills to design BI and Analytics projects.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
305G.1	Remember	STATE various concepts and models in E-Business with respect to Business Intelligence.
305G.2	Understand	EXPLAIN the concept of E-Business infrastructure and framework of E-Business Models.
305G.3	Apply	MAKE USE OF BI applications in different domains such as CRM, HR, Production.
305G.4	Analyze	EXAMINE the need of business intelligence & role of mathematical models while making e-business strategies.
305G.5	Evaluate	SELECT the appropriate frameworks and models of e-business for business success.
305G.6	Create	DESIGN BI Application frameworks for different domains such as CRM, HR, Production.

Course Outline:

Unit 1: Introduction, Background and Current Status, Case studies, e-Business Architecture - Enabling Technologies- Information distribution and messaging Technologies- Information Publishing Technology.

Unit 2: e-Business Infrastructure - e-Business Design, Capacity Planning, Performance Modeling- Mobile commerce- framework and models eBusiness Models - e-Marketing, e-CRM, Internet advertising - e-Business. Security/Payment Services - e-SCM, e-Procurement - Portals- Search Engines – Online Community building.

Unit 3: e-Business Strategy into Action, Challenges, Legal Issues - Business Plan Presentation and Demonstration “Launching e-Business: From Idea to Realization”.

Unit 4:Business Intelligence: definition, concept and need for Business Intelligence, Case studies
BI Basics : Data, information and knowledge, Role of Mathematical models.

Unit 5:BI Applications in different domains- CRM, HR, Production.

Prescribed Books:

1. Business Intelligence Success Factors Tools for aligning your business in the global economy by Olivia Parr Rud, John Wiley and sons, 2009.
2. The Profit impact of Business Intelligence by Steve Williams and Nancy Williams, Morgan Kauffman Publishers/ Elsevier, 2007.
3. Business Intelligence: Practices, Technologies, and Management- Rajiv Sabherwal, Irma Becerra-Fernandez.
4. Knowledge Management by Jawadekar, McGraw-Hill.

Suggested Readings:

1. E-Government, E-Business, and National Economic Performance Journal: Communications of AIS, Shirish Shrivastava.
2. The Great Mind Challenge for Business, Vol. 1 and 2, IBM (I) Pvt. Ltd, Bangalore.

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COURSE CODE	MB306G
COURSE TITLE	E-COMMERCE AND SOCIAL MEDIA MARKETING
COURSE CREDITS	3

Course Description :

E-commerce has moved into the mainstream life that have the market brands and financial muscle required for the long term deployment of e-commerce technologies and methods. As the growth of Internet and the popularity of social media among consumers, firms can now communicate with consumers in non-traditional fashion.

Course Objectives:

1. To comprehend the marketing strategy applications enabled by the Internet technology.
2. To assess the influence of new media and social networks on consumer behavior and marketing response.
3. To develop ability to compare the pros and cons of different online platforms such as blogs, online reviews, or online discussion forums etc.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
306G.1	Remember	REMEMBER various types of e-commerce
306G.2	Understand	UNDERSTAND the various entrepreneurial ventures in e-Commerce and m-Commerce
306G.3	Apply	ORGANISE ROI driven digital campaigns across different channels.
306G.4	Analyze	EXAMINE trends in supply chain management
306G.5	Evaluate	EVALUATE and prepare digital marketing strategies using latest trends.
306G.6	Create	CREATE roadmap for any company in terms of Social Media marketing services.

Course Contents:

Unit 1: Introduction to E-commerce, Models and Concepts

What is e-commerce?, Difference between e-commerce and business, Features of e-commerce technology, Types of e-commerce, Types of business models, B2C Business Models.

Unit 2: E-Commerce Infrastructure and Marketing

The Internet today, The Internet and web, The Internet Audience and Consumer Behaviour, Online Consumer behavior model, Shoppers: Browsers v/s Buyers, The Revolution in internet marketing technologies, B2B and B2C e-commerce marketing and branding strategies, Establishing the customer relationship, Customer retention, Net Pricing strategies, E-Commerce and marketing communications.

Unit 3: Ethical, Social and Political Issues in E-Commerce

Moral dimensions of an internet society, Responsibility, Accountability and Liability, Intellectual Property Rights, Copyright, Patents, E-commerce Governance, Public safety and welfare.

Unit 4: Online Retail Services and Supply Chain Management

The online retail sector, Online services sector, Advantages and Disadvantages, B2B e-commerce evolution, Trends in supply chain management.

Unit 5: Social Media Marketing

Strategic planning with social media, Social consumers in digital communities, The four zones of social media, Measuring the impact of social media- Digital Marketing and Viral (Content) Marketing.

Prescribed Books:

1. Kenneth Laudon and Carol Traver, E-Commerce: Business. Technology Society; 4th edition, Pearson education.
2. Chaffey, Dave ; E-Business and E-Commerce Management, 3rd edition, Pearson Education, England.
3. Tuten, Tracy L. and Michael R. Solomon, (2013), Social Media Marketing, Pearson Education, England.

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COURSE CODE	MB307G
COURSE TITLE	DATABASE MANAGEMENT SYSTEM
COURSE CREDITS	3

Course Description :

Investigates how database management system techniques are used to design, develop, implement and maintain modern database applications in organizations.

Course Objectives:

1. To learn about the basic concepts of Database, DBMS.
2. To learn about types of Databases characteristics and properties.
3. To understand mechanism for organizing, structuring and storing data.
4. To understand objectives of a data base management system are to facilitate the creation of data structures and relieve the programmer of the problems of setting up complicated files.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
307G.1	Remember	STATE the concepts, models and fundamental elements of relational database management systems.
307G.2	Understand	DESCRIBE the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
307G.3	Apply	IMPLEMENT various concepts and models of Database Systems and Applications.
307G.4	Analyze	EXAMINE and choose database storage and recovery techniques.
307G.5	Evaluate	APPRAISE the ER-model to relational tables, populate relational database and formulate SQL queries on data.
307G.6	Create	CONSTRUCT a commercial relational database system (Oracle, MySQL) utilising the system and SQL.

Course Contents:

Unit 1: Introduction: History: Advantages and limitations of RDBMS; Users of RDBMS, Software Modules in RDBMS; Architecture of RDBMS.

Unit 2: Modeling Techniques: Different Types of Models, Introduction to ERD.

Unit 3: Hierarchical Database, Data Mining for Business Decision Relational Database Introduction; Codd's Rules; Concept of Domain, Tuple, Cardinality; Comparison between HDB-NDB-RDB.

Unit 4: Normalization Advantages and disadvantages of Normalization; 1NF-2NF-3NF- rules with examples; Anomalies.

SQL commands. Basic Structure, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Views, Complex Queries, Modification of the Database, Joined Relations, Data-Definition Language, Embedded SQL, Dynamic SQL, Exercises.

Unit 5: Introduction to object oriented database Concept, Object binding in Oracle - Class, Attribute, Methods, Object type, Definition, Declaring and initializing, Methods, Alter and Drop

type.

Prescribed Books:

1. DATABASE System Concepts, Silberschatz, Korth, Sudarshan.
2. SQL by Scott Urman.

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COURSE CODE	MB308G
COURSE TITLE	SUPPLY CHAIN MANAGEMENT INFORMATION SYSTEMS
COURSE CREDITS	3

Course Description :

This course studies the advanced design of the SCM operations using e-business connectivity and emerging information systems for visibility, event management and optimization from source of raw materials to the ultimate consumer of products and services.

The major SCM processes of procurement, production, logistics, after-sales - service, and order commitment must be integrated and linked with customer relationship management (CRM) processes to create customer value at the lowest total system cost to create economic value added (EVA).

The emergence of global competition is creating a need for instant order commitment, rapid delivery, and mass customization of products and services, which is well beyond the capability of most of today's SCM operations. To meet these future requirements, SCM operations must increase its competence through the internal integration and external collaboration of processes, organizations and new technologies.

Course Objectives:

1. To introduce process and functions of supply chain management.
2. To appreciate the design and network in supply chain management.
3. To understand the role of coordination in supply chain management.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
308G.1	Remember	STATE various key concepts, models of Supply Chain Management and Information Systems.
308G.2	Understand	EXPLAIN the structure of modern day supply chains and Role of ICT in supply chain management.
308G.3	Apply	MAKE USE OF Business Process Reengineering in Supply Chains and Interpret the different flows that occur in real-world supply chains.
308G.4	Analyze	COMPARE the functionality of various IT systems associated with SCM.
308G.5	Evaluate	JUSTIFY the use of key Operational Aspects in Supply Chain Management.
308G.6	Create	INVESTIGATE the relationship between Customer Value and Supply Chain Management.

Course Contents:

Unit 1: Supply chain Information Systems: Supply chain Processes, Advanced Planning Systems (APSs), ERP, Development of ERP and SCM: Role of ICT in supply chain Management.

Unit 2: Supply chain management Software Options, Business Process Reengineering in Supply Chains: Implementation of ICT to improve ISCM (Internal Supply Chain Management).

Unit 3: System Selection: ERP System Selection methodology.

Unit 4: Supply Chain Software Installation Project management: Benefits of ICT implementation in Supplychain.

Unit 5: Challenges in CRM (Customer Relationship Management) and SRM (Supplier Relationship Management).

Prescribed Books:

1. Introduction to e-Supply Chain Management by David Ross (St. Lucie Press, 2003) ISBN 1- 5444-324-0.
2. Supply Chain and Logistics by Bauer, Porrier, Lapide and Bermudez (CLM Press, 2001) ISBN 0-9658653-5-5.
3. Innovations in Supply Chain Management for Information Systems: Novel Approaches (Premier Reference Source) 1st Edition by John Wang.

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COURSE CODE	MB309G
COURSE TITLE	SOFTWARE PROJECT MANAGEMENT
COURSE CREDITS	3

Course Description:

In depth knowledge is required while developing the software. Basic principles of project management along with framework and process models will help IT professionals to estimate the risk involved in different projects and give them the right directions to complete project efficiently. Important concepts like project reporting structure, project progress and tracking mechanisms using project management principles is core requirement for IT professionals and gaining adequate knowledge of it will help them to become successful in their careers.

Course Objectives:

1. To know the Software Project Planning and Evaluation techniques.
2. To understand software development life cycle (SDLC).
3. To become skilled at activity planning and risk management principles.
4. To supervise and Lead software projects and control software deliverables efficiently.
5. To understand the importance and issues of people management in Software Project Planning.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
309G.1	Remember	STATE various key concepts, models of project management.
309G.2	Understand	EXPLAIN the significance of project management methodologies and tools at the distinct stages in the Project's life cycle.
309G.3	Apply	DEMONSTRATE the significance of Project Management in a various industries and businesses.
309G.4	Analyze	EXAMINE the management of software configurations and contracts with respect to Project Management.
309G.5	Evaluate	JUSTIFY the use of various models of project management for software business solution.
309G.6	Create	DESIGN the dashboard, status report and index for Key Performance Indicators of project for the Management.

Course Outline:

Unit 1: Project Evaluation And Project Planning

Importance of Software Project Management – Activities – Methodologies – Categorization of Software Projects – Setting objectives – Management Principles – Management Control – Project portfolio Management – Cost-benefit evaluation technology – Risk evaluation – Strategic program Management – Stepwise Project Planning.

Unit 2: Project Life Cycle And Effort Estimation

Software process and Process Models – Choice of Process models – Rapid Application development – Agile methods – Dynamic System Development Method – Extreme Programming – Managing interactive processes – Basics of Software estimation – Effort and Cost estimation

techniques – COSMIC Full function points – COCOMO II – a Parametric Productivity Model.

Unit 3: Activity Planning And Risk Management

Objectives of Activity planning – Project schedules – Activities – Sequencing and scheduling – Network Planning models – Formulating Network Model – Forward Pass & Backward Pass techniques – Critical path (CRM) method – Risk identification – Assessment – Risk Planning – Risk Management – PERT technique – Monte Carlo simulation – Resource Allocation – Creation of critical paths – Cost schedules.

Unit 4: Project Management and Control

Framework for Management and control – Collection of data – Visualizing progress – Cost monitoring – Earned Value Analysis – Prioritizing Monitoring – Project tracking – Change control – Software Configuration Management – Managing contracts – Contract Management.

Unit 5: Staffing In Software Projects

Managing people – Organizational behavior – Best methods of staff selection – Motivation – The Oldham – Hackman job characteristic model – Stress – Health and Safety – Ethical and Professional concerns – Working in teams – Decision making – Organizational structures – Dispersed and Virtual teams – Communications genres – Communication plans – Leadership.

Prescribed Books :

Bob Hughes, Mike Cottrell and Rajib Mall: Software Project Management – Fifth Edition, Tata McGraw Hill, New Delhi, 2012.

Suggested Readings:

1. Robert K. Wysocki —Effective Software Project Management – Wiley Publication, 2011.
2. Walker Royce: —Software Project Management- Addison-Wesley, 1998.
3. Gopalaswamy Ramesh, —Managing Global Software Projects – McGraw Hill Education (India), Fourteenth Reprint 2013.

INTERNATIONAL BUSINESS MANAGEMENT SPECIALIZATION

PSO-1: Demonstrate Proficiency in the International Business Management domain through understanding the international business environment, trade policies, foreign exchange, international finance, and logistics to undertake international trade.

PSO-2: To inculcate the ability to gain multidisciplinary knowledge through case analysis, projects-based Learnings, Internships, Industrial Visits, Corporate Sessions, international banking, logistics & SCM, international marketing & FOREX to support international trade.

COURSE CODE	MB303H
COURSE TITLE	INTERNATIONAL BUSINESS ENVIRONMENT & TRADE INSTITUTIONS
COURSE CREDITS	3

Course Description:

The course examines the structure and features of the international markets, how organisations engage with these markets, and how they respond to its complexities. Students are introduced to useful theoretical and analytical frameworks that are crucial to understanding the opportunities and risks derived from the political, economic, social, technological and institutional environment of countries.

The course also reviews aspects of global institutions, such as the World Trade Organization (WTO) and International Monetary Fund (IMF), which set global rules that profoundly affect business strategy and human welfare.

Course Objectives:

1. To Remember, Recall and Describe the key concepts of international Business Environment.
2. To Understand the relevance of Multinational Corporations (MNCs) in global trade.
3. To Apply and Demonstrate the significance of FDI and FPI in respect of developing economy.
4. To Analyze the issues related to Labor, Environmental and Global Value chain.
5. To Evaluate, Formulate and discuss the case related to various Agreements under WTO and contemporary global business environment.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
303H.1	Remember	STATE the key concepts, theories and terms of International Business Environment and Trade Institutions. State the
303H.2	Understand	DISCUSS the relevance of Multinational Corporations (MNCs) in global trade
303H.3	Apply	MAKE USE OF various concepts, theories of FDI while analyzing International business environment.
303H.4	Analyze	RELATE various Financial, economic & other business related aspects of International Business Environment & its impact on

		business.
303H.5	Evaluate	APPRAISE the pattern of Foreign Trade and Foreign Investment in India with the help of Balance of Payment statement and the trend of FDI.
303H.6	Create	FORMULATE suitable market entry strategies for business by detailed study of International Business environment.

Course outline:

Unit 1: Introduction to International Business

Importance, nature and scope of International business, modes of entry into International Business, internationalization process, Globalization- Meaning, Implications, Globalization as a driver of International Business. The Multinational Corporations (MNCs) - evolution, features and dynamics of the Global Enterprises, Consequences of Economic Globalization, Brexit, Reverse globalization.

Unit 2: International Business Environment

Political Economy of International Business, Economic and Political Systems, Legal Environment, Cultural Environment, Ethics & CSR in International Business, Introduction to Concept of IFRS.

Unit 3: International Financial Environment

Foreign Investments - Pattern, Structure and effects. Theories of Foreign Direct Investment, Traditional and Modern theories of FDI, Modes of FDI - Greenfield, Brownfield Investments, Mergers and Acquisitions, Motives of FDI, FDI contrasted with FPI. Basics of Forex Market.

Unit 4: International Economic Institutions and Agreements

WTO, IMF, World Bank, UNCTAD, Tariff and Non-tariff Barriers, Balance of Payment Account: Concept and significance of balance of payments, Current and capital account components.

Unit 5: Emerging Issues in International Business Environment

Growing concern for ecology, Digitalization, Outsourcing and Global Value chains. Labor and other Environmental Issues, Impact of Pandemic COVID-19 on international trade.

Prescribed Books:

1. Global Business Management by Adhikary, Manab, Macmillan Publishers, New Delhi.
2. International Business Environment by Black and Sundaram, Prentice Hall of India, New Delhi
3. Economic Environment of Business by Gosh, Biswanath, South Asia Book, New Delhi.
4. International Business by Aswathappa Tata Mc Graw Hill publications, New Delhi.
5. International Business by P. Subha Rao

Suggested Readings:

1. Going International Response Strategies for Indian Sector by Bhattacharya.B, Wheeler Publishing Co, New Delhi.
2. International Economies by D.N. Krithani.
3. International Business by Roger Bennett.
4. Business Environment by C.B. Gupta.
5. International Business by Francis Cherunillam.

COURSE CODE	MB304H
COURSE TITLE	INTERNATIONAL BUSINESS ECONOMICS
COURSE CREDITS	3

Course Description:

Understand economic dimensions of foreign trade. Explain economic aspects of foreign trade in particular items. Analyse economic consequences of foreign trade policies.

Course Objectives:

1. To Understand Global Economic Institution and their role and Impact of global economy on industry/enterprise.
2. To Devise international business economic strategies.
3. To Design international business economic programs.
4. To develop positive attitude towards international business economics.
5. To inculcate attitude of learning and understanding international business economics and markets.
6. To enable you to act with confidence as skilled economists in roles such as management consultancy or in a general management role.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
304H.1	Remember	STATE the major theories, concepts, & methods in the field of International Trade
304H.2	Understand	Explain the concepts of Balance of Payment, Macroeconomic Concepts & International Crises
304H.3	Apply	INTERPRET fiscal, monetary and international trade policies of India along with the tariff and Non-tariff policies.
304H.4	Analyze	EXAMINE various risks involved in International trade and its impact on international banking.
304H.5	Evaluate	APPRAISE various provisions under India's Trade policies including Export taxes, subsidies, economic integration with other countries, etc.
304H.6	Create	INVESTIGATE the reasons for cause of Financial Crisis across the world, including Euro Crisis, Asian Crises 1997, Financial Crises 2007-08, Russian Financial Crises 2014, Global Pandemic Crises 2020, etc.

Course Contents:

Unit 1: Overview of International Trade & Theories

Meaning of International Trade, theories of international trade- Ricardo and Comparative advantage, (International Trade Theories- Classical theory by Ricardo, Endogenous growth model by Solow-Swan) Heckscher Ohlin model of Factor endowments.

Unit 2: Trade Policies

Unilateral and multilateral trade policies, Tariffs in competitive markets, WTO tariff policy, Quota, Tariff and quota in monopolistic markets, Dumping and Antidumping Duty under the WTO, Subsidies and Countervailing duties under the WTO, Export taxes, Export subsidies, Economic Integration - Custom Unions and Free Trade Areas - Major Regional Trade Agreements.

Unit 3: Balance of Payment, Macroeconomic Concepts & International Crises

Surplus & deficit Balance of Payment, Current and capital account of Balance of payment, Instruments of Fiscal Policy, Instruments of Monetary Policy, Objectives of both policies and implications on Inflation, Concept of Inflation with Types. Understanding the recent few crises, The Euro Crisis/ crisis in Venezuela, Asian Crises 1997, Financial Crises 2007-08, Russian Financial Crises 2014, Global Pandemic Crises 2020.

Unit 4: International Banking

Reserves, Debt and Risk, Nature of International Reserves, Demand for International Reserves, Supply of International Reserves, Gold Exchange Standard, Special Drawing Rights, International Lending Risk, The Problem of International Debt, Financial Crisis and the International Monetary Fund, Eurocurrency Market.

Unit 5: Women Empowerment in the World Economy: Women's empowerment, women's rights and gender equality, empowering women in economy, initiatives by governments in different countries, Women's economic equality, women employment & business opportunities, case studies on women entrepreneurs.

Prescribed Books:

1. International Economics Theory and Policy by Paul Krugman, Maurice Obstfeld, Pearson Education
2. International Economics by Robert Carbaugh, Thomson – South Western
3. International Business by John Daniels, Lee Radebaugh, Daniel Sullivan and Prashant Salwan, Pearson
4. International Economics by Thomas Pugel, McGraw-Hill-Irwin

Suggested Readings:

1. The World is flat by Friedman Thomas.
2. International Economics by Edward Leamer, editor.
3. Jagdish N. Bhagwati, Arvind Panagariya, and T. N. Srinivasan, Lectures on International Trade.
4. Rethinking International Trade by Paul R. Krugman.

COURSE CODE	MB305H
COURSE TITLE	EMERGING TRENDS IN INTERNATIONAL BUSINESS
COURSE CREDITS	3

Course Description:

As the economy grows slowly, our business may have to look at selling internationally to remain profitable. Before examining foreign markets, we have to be aware of the major trends in international business so we can take advantage of those that might favor our company. International markets are evolving rapidly, and we can take advantage of the changing environment to create a niche for our business.

Course Objectives:

1. To understand Global Political, Economic, and Cultural Environment.
2. To know impact of trends in international markets iii. Know various terminology used by industry.
3. To devise international business strategies.
4. To develop positive attitude towards understanding trends in international marketing.
5. To inculcate attitude of learning and understanding of international marketing environment and markets before taking international marketing decisions.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
305H.1	Remember	STATE the major aspects of Socio-economic, Political, Legal, Technological and Ecological issues across the world.
305H.2	Understand	DESCRIBE the changes that have happened in Demographics, technology, intellectual Property and Ecological issues across the world.
305H.3	Apply	INTERPRET the evolution of Technology and Laws due to the changes in international business environment.
305H.4	Analyze	EXAMINE the impact of Liberalization and technology development on overall International business.
305H.5	Evaluate	APPRAISE the issues related to Industrial revolution, AI, VR, Machine learning, Climate Change, etc. and its impact on how the trade is conducted in 21st Century.
305H.6	Create	INVESTIGATE the reasons for increase in Political integration fragmentation, Growing nationalism, Terrorism and its impact of growth of International business in an economy.

Course Content:

Unit 1: Socio – Economic Trends

Growing emerging markets, Slower growth, Liberalization, Trade barriers, Demographic changes.

Unit 2: Political Trends

Political integration fragmentation, Growing nationalism, Terrorism, Growth of identity politics.

Unit 3: Technological Trends

Industrial revolution 4.0, AI, VR, Machine learning etc., Technology development in other areas – 3 D printing, bio-technology etc.

Unit 4: Legal Trends

Harmonization of laws, Trade laws, Intellectual property laws etc.

Unit 5: Ecological Issues and Trends

Climate change, Sustainable development, other ecological issues.

Prescribed Books:

1. International Marketing, 17 th Edition by Philip R. Cateora, John L. Graham, Prashant Salwan - Tata McGraw Hill.
2. International Marketing Management: An Indian Perspective, 24 th Edition by Varshney, Bhattacharya - S Chand.
3. Global Marketing Management, 8 th Edition by Warren Keegan.

Suggested Reading:

1. International Marketing: Analysis And Strategy, 4 th Edition by Onkvisit, S. & Shaw, J.J. Prentice- Hall of India Private Limited/ New Delhi.

GBSRC MBA Syllabus

COURSE CODE	MB306H
COURSE TITLE	INTERNATIONAL TRADE, WTO AND TRADE POLICY ISSUES
COURSE CREDITS	3

Course Description:

The purpose of the trade policy courses is to ensure that participants are thoroughly exposed to all WTO-related issues, and develop practical skills as well as an extensive network of contacts. They also serve as a general introduction for those who may become specialists at a later stage.

Course Objectives:

1. To develop a good understanding of all aspects of the WTO, including the Agreements.
2. To improve analytical and negotiating skills.
3. To learn to use effectively the relevant information and documentation on trade-related issues.
4. To strengthen capacity to work in teams and in an international environment.
5. To establish and/or strengthen a network of contacts with each other and the trainers/experts.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
306H.1	Remember	STATE the concepts, theories and the intricacies of WTO and the trade policy.
306H.2	Understand	EXPLAIN the various terminologies and provisions related to import and export Policy
306H.3	Apply	INTERPRET the theories of international trade in international businesses in context to 21st Century international business.
306H.4	Analyze	COMPARE and CONTRAST among various Tariff and Non-tariff policies, various documents used in international trade, various aspects of Foreign Trade Policy and theories of International trade.
306H.5	Evaluate	APPRAISE various Laws and the rules and regulations related to international trade.
306H.6	Create	INVESTIGATE various aspects of International business environment with the use of Case studies.

Course Contents:

Unit 1: International Business Environment

Globalization – Forces, Meaning, dimensions and stages in Globalization – Introduction to theories of International Trade by Adam Smith, Ricardo and Ohlin and Heckler – Trading Environment of International Trade – Tariff and Non-tariff Barriers – Trade Blocks – Rise of new economies like Japan, South East Asia and China as compared to India.

Unit 2: Bilateral and Multilateral Trade Laws

General Agreement on Trade and Tariffs, (GATT), World Trade Organization – IPR, TRIPS, TRIMS, GATS – Ministerial Conferences.

Unit 3: EXPORT – IMPORT POLICY 2002-2007

Procedures and Documentation, GSP Rules of Origin, ECGC, Exim Bank / Lines of Credit. Documents prescribed by some importing countries, Trade Fair Authority Exhibitions /

International Exhibition / FIEO/ ITPO L/C, B/L etc. Costing, QBAL/ VBAL, DEPB.

Unit 4: Selected Trade Developments and Issues

Unit 5: Case Studies: Cases on theories of International Trade Cases on WTO, Cases on International Marketing.

Prescribed Books:-

1. International Business Environment – Sundaram and Black
2. International Business Environment – Bhalla and Raju
3. International Financial Management – P.G. Apte
4. International Business – Francis Cherulianam
5. Import Management in a developing economy
6. Import Procurement Planning
 - a. Registration of factories with concerned authorities DGTD, SSE, in relation to import of Capital Goods
 - b. Project Import/ EPCG
 - c. Identification, Selection and Evaluation of Suppliers
 - d. Purchase Contract, Terms of Delivery and Payment.

GBS RC MBA Syllabus

COURSE CODE	MB307H
COURSE TITLE	INTELLECTUAL PROPERTY RIGHTS
COURSE CREDITS	3

Course Description:

The course is tailored to meet industry requirements as well as the needs of aspiring professionals. It includes up-to-date education in US, European and Indian Patent and IP laws and procedures and is designed and delivered by outstanding professionals with rich teaching, research, industry and consulting experience. The course is designed with a view to create IPR consciousness; and familiarize the students about the documentation and administrative procedures relating to IPR in India.

Course Objectives:

1. To encompass all relevant IP legislations in India with a view to understand and adjust with changing needs of the society because creative work is useful to society and law relating to innovation/creativity.
2. To disseminate information on national and international IPR issues.
3. To introduce necessity and importance of IPR.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
307H.1	Remember	STATE various concepts and the historical evolution of Intellectual Property Rights in India and Globally.
307H.2	Understand	EXPLAIN how intellectual property laws help to protect the interest of the creator and various provisions of IP laws in India.
307H.3	Apply	INTERPRET the trade secret laws and the provisions of various International Treaties and Conventions for Protection of IPs.
307H.4	Analyze	RELATE all relevant IP legislations in India with view to understand and adjust with changing needs of the society because creative work is useful to society and law relating to innovation/creativity
307H.5	Evaluate	APPRAISE various types of Intellectual Property Rights, the IP environment in India and globally.
307H.6	Create	FORMULATE suitable IP strategy with the help of various facts presented in a case study.

Course Contents:

Unit 1 : Introduction of Intellectual Property Rights

Meaning, History, Concepts and Types, International Treaties and Conventions for Protection of IPs, Role of Intellectual Property in Growth, Development, Various types of Intellectual Property Rights: Trademarks Basic, Copyright Basics, Trade Secrets, Geographical Indications.

Unit 2: Introduction of WTO in intellectual Property (TRIPS)

Intellectual Property: protection and enforcement, Origins: into the rule-based trade system, Basic principles, National treatment, MFN, and balanced Protection.

Unit 3: Economic Concepts relevant to intellectual Property Rights

Trade secret law, Protection and Maintenance of IP, Trademark: Statutes, Filing Procedure, Copyright: Statutes, Filing Procedure, Trade secrets: Protection, Patent: Statutes, Filing Procedure.

Unit 4: Registration of IPR in India

Guidelines for IPR, Registration process of IPR, Specification Drafting, Patent Prosecution.

Unit 5: WIPO (World Intellectual Property Organisation)

Functions/Role of WIPO, WIPO & India.

Case Studies: Related to WTO and Intellectual Property Rights.

Prescribed Books:

1. Cornish William, Intellectual Property.
2. P. Narayanan, Intellectual Property Law.
3. Rahul Matthan, The law relating to Computers and the Internet.
4. Copinger and Skine James, Copyright.
5. Pal P, Intellectual Property Rights in India.
6. Unni, Trade Mark, Design and Cyber Property Rights.
7. Rodney Ryder, Intellectual Property and the Internet.
8. <http://www.ipindia.nic.in/>

GBSRC MBA Syllabus

COURSE CODE	MB308H
COURSE TITLE	INTERNATIONAL BANKING
COURSE CREDITS	3

Course Description :

The course provides an Contents of international banking and deals with recent developments and a solid understanding of international banking. Issues such as the historical evolution and foundation of international banking and its management, risk management, financial crises, commercial banking, investment banking, and regulations, supervision and crashes of international banking will bediscussed.

Course Objectives:

1. To understand how international banks operate in global markets.
2. To understand regulatory framework governing International Bankingoperations.
3. To understand the working of International Credit RatingAgency.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
308H.1	Remember	STATE the evolution of International Banking in India and the development of International banking in terms of Legal and Regulatory framework, Global banking system, and other important aspects of International Banking.
308H.2	Understand	CLASSIFY & DISCUSS various types of International Banks in India along with their roles and functions.
308H.3	Apply	INTERPRET the complex international banking issues by identifying and evaluating relevant issues and information.
308H.4	Analyze	DISTINGUISH between various banking systems globally.
308H.5	Evaluate	APPRAISE various frameworks and organization structures of international bank along with other relevant issues in International banking.
308H.6	Create	INVESTIGATE various issues related to FII, FDI, International Lending, BASEL Norms, etc.

Course Contents:

Unit 1: Introduction to International Banking

Meaning of International Bank, The working of Medici Bank in Renaissance Europe, Globalisation of banking, Structuring overseas operations, Commercial banking vs Investment Banking.

Unit 2: Legal And Regulatory Framework

Regulatory Framework, BASEL Norms, International law, choice of law, conflict of laws, jurisdictional issues, Exchange management and controls, International loan agreements, covenants and clauses , Country risk and bank risk management, International debt management, Anti Money laundering laws.

Unit 3: Global Banking System

American Banking System: Organisation, structure andfunctions Indian Banking System:

Organisation, structure and functions German Banking System: Deutsche Bundes Bank, German Central Bank – Organisation, structure and functions.

Unit 4: International Corporate Finance

Fundamental principles of lending MNC, documentation and monitoring of Corporate Finance, International credit rating agencies and global capital markets Raising resources and its deployment, ECBs / FCNRs, Syndicated Loans, Role of FIIs, FDIIs and EXIM Bank.

Unit 5: International Banking and Development

Bank lending in developing countries Microfinance Bank lending and sustainability (the Equator Principles) The role of public institutions (IMF, WB, IDB).

Prescribed Books:

1. Andrew W. Mullineux (edited), Handbook of International Banking, Edgar El-gar Publishing and J.Hughes.
2. S. MacDonald, International Banking: Text and Cases, Addison-Wesley Publishing.
3. B. Casu, Introduction to Banking, PrenticeHall.

GBSRC MBA Syllabus

COURSE CODE	MB309H
COURSE TITLE	INTERNATIONAL LOGISTICS & SUPPLY CHAIN MANAGEMENT
COURSE CREDITS	3

Course Description:

Logistics and supply chain management (SCM) are two important inter-related functions of an organization that focus on timely delivery of products to customers. SCM is a broad concept that encompasses all activities involved in the movement of a product from its raw stage to the final delivery to customers.

Course Objectives:

1. To study the concept of logistics and supply chain management.
2. To know packing requirements for export of goods.
3. To learn international transport.
4. To understand international logistics and supply chain management.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
309H.1	Remember	STATE the conceptual framework of the discipline of OB and its practical applications in the organizational set up.
309H.2	Understand	EXPLAIN the role of individual, groups and structure in achieving organizational goals effectively and efficiently.
309H.3	Apply	DEMONSTRATE different motivational theories and methods to increase the productivity and job satisfaction of employees.
309H.4	Analyze	EXAMINE effective techniques for managing conflict in changing business environment.
309H.5	Evaluate	Critically EVALUATE and analyses theories and models that contribute to the discipline's overall understanding.
309H.6	Create	Recognize stress in the workplace and DEVELOP programs to successfully reduce stress in employees.

Course Outline:

Unit 1: Basic Concepts of Logistics & Supply chain

Types of Logistics, Evolution of Logistics and Supply Chain Management, International Logistics and Supply Chain Management, Distinguish between Logistics and Supply Chain Management.

Unit 2: International Trade & Globalization

Effects of Globalization on International Trade, Outsourcing and Offshoring as an Emerging Trend in International Trade.

Unit 3: International Procurement and Sale

International Purchasing/procurement system, ISO supply chain management selection, Export sales contract & its constituents.

Unit 4: International Transport

Concept of International Transport, Role of transportation in Logistics, Container Yards, Inland Container Depots, Container Freight Stations, Transportation selection decision, Chartering.

Unit 5 : International Shipping

International Commercial Documents, Export Packaging, Customs Clearance Process.

Prescribed Books:

1. Logistics and Supply Chain Management, Christopher Martin, Prentice Hall, Fourth Edition.
2. International Logistics: Global Supply Chain Management, Long, Douglas, Springer US.
3. Supply Chain and Logistics Management 1st Edition 2020 by Dr. Dixit Garg. New Age International (P) Ltd Publisher.

Suggested Readings:

1. Textbook of Logistics and Supply chain Management: Agarwal D K.
2. <https://www.cargoflores.com/en/service/international-logistics-and-distribution>.

GBSRC MBA Syllabus

HOSPITAL AND HEALTHCARE MANAGEMENT SPECIALIZATION

PSO-1: Demonstrate the Proficiency in Hospital and Healthcare Management domain like Hospital Administration, Medical Tourism, Healthcare Law, Community Healthcare Management, Hospital Information System, Health Insurance & TPA, Quality Management in Healthcare, Management of Corporate Hospitals, Marketing of Health Care Services and Artificial Intelligence (AI) in Healthcare Sector to optimally solve the business problems.

PSO-2: To inculcate the ability to gain multidisciplinary knowledge through Case Analysis, Projects-Based Learnings, Internships, Industrial Visits, Corporate Sessions to support the Hospital and Healthcare Functions.

COURSE CODE	MB303I
COURSE TITLE	MEDICAL TOURISM AND TRANSNATIONAL HEALTHCARE
COURSE CREDITS	3

Course Description:

This course is being introduced to enable the students with the core knowledge of Healthcare ecosystem along with the introduction of Medical Tourism across the national boundaries. The course also elaborates on the scope and challenges faced by the both consumer of medical tourism and the citizen of health-care systems to more easily recognize the emerging set of transnational structures and networks that seek to serve all patients. Also to assess treatment quality and the ethical consequences for international patients within health-care systems.

Course Objectives:

1. To understand the scope of medical tourism among cross-border health care system, dependent on science and technology-led medical expert treatment.
2. To assess and analyze the quality of services, which can satisfy the needs of patients for health care across national borders and between national health systems.
3. To learn more about the advancement in Medical Tourism & Transnational Healthcare in India.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
303I.1	Remember	STATE the important concepts, Drivers, challenges and Barriers of Medical Tourism and advancement in Medical Tourism.
303I.2	Understand	DESCRIBE the Medical Tourism and Cross border destination management.
303I.3	Apply	MAKE USE of Medical Travel Health services and its marketing to enhance Medical Tourism.
303I.4	Analyze	SELECT appropriate policy management and business responses for Entanglements with Medical Tourism.

303I.5	Evaluate	JUDGE 'Tourist as a Patient' OR 'Patients as a Tourist'.
303I.6	Create	DESIGN a Medical Travel Health services and its marketing plan.

Course Outline:

Unit 1: Introduction to Medical tourism

What is Medical tourism? Scope of Medical Tourism, Main Drivers of Medical Tourism, Advantages & Disadvantages of Medical Tourism, Challenges & Barriers, Medical Tourism Popularity, Advancements in Medical tourism, Career Opportunity in Medical Tourism.

Unit 2: Medical tourism and Cross-border Destination Management

Patient's perception on medical tourism destinations, Medical Tourists: Knowledge & Globalization, Cross-border Medical Travel Companies, Medical Tourism sites & destination, Levels of Destination Management, Towards a Model of Sustainable Health Destination: Management based Healthcare regions.

Unit 3: Entanglements with Medical Tourism: Policy Management and Business Responses

Ethical management of Medical Tourism, Impact of Internet on Medical Tourism, Impact of Medical Tourism in low & middle income countries, Transnational Healthcare & Cross-culturalism, Policies and Documentation required for Medical Tourism in Hospitals.

Unit 4: Medical Travel Health services & its Marketing

Companies marketing Insurance product for International patients, Acquiring Medical travel facilities through Agents/mediators, Global Tie-ups with Healthcare Companies, Marketing of complete packages & effective treatment plan, Price & Cost saving Strategies.

Unit 5: "Tourists as a Patient" OR "Patients as a Tourist"

Transplant Tourism & Organ Trafficking, Beauty & the Beach: Mapping Cosmetic Surgery Tourism, Cross Border reproductive care, Tourist with severe disability, A way through the maze: Exploring differences & overlaps between wellness & medical Tourism.

Prescribed Books:

1. David Botterill, Guido Pennings 2013, Medical Tourism and Transnational Healthcare.
2. Global Trends in Health and Medical Tourism by Rajesh Kumar, SBS Publishers and Distributors Pvt Ltd.
3. Healthcare Tourism in India (English, Hardcover, C. B. Venkata Krishna Prasad).

Suggested Readings:

1. Abhyankar, A. 2013. Growth potential of the domestic and international tourism in India. Review of Integrative Business & Economics Research, 2(1):566- 576.
2. Awadzi, W and D. Panda. 2007. Medical tourism: globalization and the marketing of medical services. The Consortium Journal, 11:75-81.
3. Bookman, M. Z., and K. R. Bookman. 2007. Medical tourism in developing countries. Palgrave MacMillan: New York.

COURSE CODE	MB304I
COURSE TITLE	MANAGEMENT OF MEDICLAIM & TPAs IN HOSPITAL
COURSE CREDITS	3

Course Description:

This course is being introduced to provide the students with the knowledge of Medclaim and third party administrator process among Hospital and Healthcare institute. Also to know how the health insurance is an effective instrument of getting reimbursement of Medical and hospitalization expenditure, as health insurance is emerging fast as an important mechanism to finance the health need of the people in an affordable manner. To know about the cashless hospitalization and challenges associated with the policy holders about the existence of TPAs and their Insurance Policy.

Course Objectives:

1. To understand about the process of Health Insurance and monitor Claim services associated with the customers/Patients policy.
2. To asses and analyze the challenges, risks and problem faced by the Customer from Hospital end or from TPAs related to the reimbursement processes.
3. To learn more about the career opportunities for booming managers for smooth functioning of Insurance Departments and TPAs for delivering hassle-free cashless Hospitalisation and quality healthcare service to customer/patients.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
304I.1	Remember	STATE the concepts, scope, types of Health insurance and the Role of Health Insurance and TPAs in Hospital.
304I.2	Understand	EXPLAIN TPA services for Insurance companies and Policy holders.
304I.3	Apply	MAKE USE of required Policies and Documentation for Cashless Hospitalization Process.
304I.4	Analyze	EXAMINE the impact of TPA Service on Hospital Administration.
304I.5	Evaluate	JUDGE the importance of Training and Education, Career Opportunities and New Trends in Health Insurance and TPAs in Hospital.
304I.6	Create	DEVELOP policies for insurance in various sectors.

Course Outline:

Unit 1: Introduction to Medclaim & Role of TPA in Hospital

What is Medclaim? What is Health Insurance? History & Scope, Types of Health Insurance, structure of Health Insurance, Roles and Responsibilities of Third party administrator for hospitals,

Role of Health Insurance? Role of TPAs in health insurance market, Impact of TPA in healthcare services, Need for medical insurance.

Unit 2: TPA services for Insurance Companies & Policy Holders

Monitor Claim, Control claim ratio, speedy handling of claim, settlements of claim, Customer grievance cell, Service and consumer education by TPA, Policy holders & healthcare providers, Norms of insurance companies.

Unit 3: Impact of TPA service on Hospital Administration

TPA filling the need gap: Access, quality & cost, Benefit management, Medical management, Provider network management, Claim adjudication, Information data management, Misplacement of bills by TPA/corporate, Issues related to authorization.

Unit 4: Policies and Documentation for Cashless Hospitalization Process

Importance of Health E-card/Insurance card, insurance forms, Documentation for submission, Knowledge about coverage & exclusion in Policies, Challenges with cashless hospitalization – Delay in discharge, Releasing funds, Accounts record, Billing issues, Inconvenience caused from patients end, Cashless facilities guidelines.

Unit 5: Careers in Insurance & TPAs in Hospital

Career opportunities at Insurance department in hospitals, Basic Roles & responsibilities as a manager of Insurance companies, Future scope, Training and Education, Fresher as medical advisor, Opportunities and New trends.

Prescribed Books:

1. Kshitij Patukale, Mediclaim and Health Insurance.
2. Yadnya Investments, How to Choose the Best Health Insurance Policy? Health Insurance in India.

Suggested Readings:

1. Dr. Symphony D. Cashless Hospitalisation and Health Insurance Awareness among General Public and Patients. AIHA; Batch XI; 2006, pg. 83, 84.
2. Gupta Indrani, Abhijith Roy, Mayur Trivedi. Third Party Administrators: Theory and Practice, Community Health Insurance. 2004. Pg. 3.

COURSE CODE	MB305I
COURSE TITLE	ESSENTIALS OF TRAINING AND DEVELOPMENT FOR HEALTHCARE PROFESSIONALS
COURSE CREDITS	3

Course Description:

This course is being introduced to know the importance of basic training and development required for healthcare professionals. There is an increasing focus on improving healthcare in order to ensure higher quality, greater access and better value for money. In recent years, training programs have been developed to teach health professionals and students formal quality improvement methods. This is an essential area for further exploration. Training professionals & managers may be important not only to ensure that they have the skills needed to improve the quality of healthcare, but also to enhance their motivation towards improving healthcare services.

Course Objectives:

1. To assess and analyze how the implementation of effective and efficient training and development of healthcare professionals can improve the quality of patient service.
2. To know how the training & grooming practices are crucial to improve safety at all levels of health care.
3. To understand how the ongoing care coordination and a person focused approach for people and their families, can contribute in satisfying the need of quality healthcare services.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
305I.1	Remember	STATE various basic soft skills necessary amongst Healthcare Professionals for better outcome.
305I.2	Understand	EXPLAIN Training and Development of Healthcare Professionals for Patient Engagement.
305I.3	Apply	MAKE USE of Competency Based Training and Development.
305I.4	Analyze	EXAMINE the Professional Development and Potential solutions.
305I.5	Evaluate	CRITIQUE the planning for Clinical Skills Course and Care Processes.
305I.6	Create	FORMULATE the clinical design making OR Competency based Training.

Course Outline:

Unit 1: Application of Basic Soft Skills Among Healthcare Professionals

Healthy Communication Skills, Telephone etiquettes, Grooming and Personality development, Assertive verbal skills, good relationship with patients, crisis management, Breaking bad news, Managerial skills, Maintaining good inter personal relationships between management & patients, Advances in simulation based continuing professional development & training.

Unit 2: Training and Development for Patient engagement

Introduction, Scope & Approach, Importance of training & development for healthcare profession, Strategy for solving Patient's Conflict, working with emotional intelligence in healthcare institutes, Proving/ receiving patient's feedback.

Unit 3: Planning for clinical skills course & care processes

Education and Training, Human factors, Administrative errors, Diagnostic errors, Medication errors, Multi morbidity, Transitions of care, Basic facilitation skills, Use of audiovisual aids/role play, group dynamics, Trainer as coach.

Unit 4: Competency Development

Introduction, Developing knowledge, skills & attitude, Emphasizing clinical design making, Facilitation learning activities and assessment of competency, conducting skills demonstration and practice session, Competency based training.

Unit 5: Professional Development & Potential Solutions

Practical approaches, Integrating safety education, Infrastructure support, Evaluation and Implementation, Assessment of training given, Monitoring outcomes.

Prescribed Books:

1. Hari Singh, 2018, Essentials of Management for Healthcare Professionals.
2. Dr. William Rayburn MD MBA, Continuing Professional Development in Medicine and Health Care: Better Education, Better Patient Outcomes.

Suggested Readings:

1. Kidd MR. The contribution of family medicine to improving health systems: a guidebook from the World Organization of Family Doctors. 2nd ed. London: Radcliffe, 2013.
2. Madigosky WS, Headrick LA, Nelson K, Cox KR, Anderson T. Changing and sustaining medical students' knowledge, skills, and attitudes about patient safety and medical fallibility. Acad Med. 2006;81(1):94-101.

COURSE CODE	MB306I
COURSE TITLE	COMMUNITY HEALTH MANAGEMENT
COURSE CREDITS	3

Course Description :

Community health is fundamental course in the principles of personal health: nutrition, mental health, drugs, exercise, sleep and rest. Community health also explores the principles of community health sanitation, community services and public health agencies.

Course Objectives:

1. To understand Modern health issues, Health care organizations structure.
2. To study Health statistics and also understand Ethics in health care.
3. To know Health care policy.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
306I.1	Remember	STATE the contribution to Community Health and its Management.
306I.2	Understand	DISCUSS the control of Communicable and Non-Communicable Diseases.
306I.3	Apply	INTERPRET Health needs of Special Populations with reference to Community Mental Health, Abuse of alcohol, tobacco, and other drugs.
306I.4	Analyze	RELATE the Healthcare Delivery System and Environmental Health Problems.
306I.5	Evaluate	CRITIQUE Intentional and Unintentional injuries and Occupational Health and Safety.
306I.6	Create	DESIGN a Community Health Management Support Mechanism.

Course Contents:

Unit 1: Contribution to Community Health

Organizations that contribute to community health, communities measure disease, injury and death.

Unit 2: Control of communicable and non-communicable diseases

Communities organize and solve health problems, Community health in schools, Health needs of mothers, infants and children.

Unit 3: Health needs of special populations

Community mental health, Abuse of alcohol, tobacco, and other drugs.

Unit 4: Health care delivery system, Environmental health problems.

Unit 5: Intentional and unintentional injuries and Occupational health and safety.

Prescribed Books:

1. Family Health Care Nursing: Theory, Practice, and Research by Joanna Rowe Kaakinen.
2. Foundations of Nursing in the Community: Community-Oriented Practice, 4e by Marcia Stanhope and Jeanette Lancaster.
3. An Introduction to Community and Public Health by James F. McKenzie

COURSE CODE	MB307I
COURSE TITLE	LAWS RELATED TO HOSPITAL AND MEDICAL SERVICES
COURSE CREDITS	3

Course Description :

This course examines the law relating to the employment relationship. It focuses on the statutory and common law regulations of individual employment contracts. Some consideration will also be given to the role of unions and collective industrial action. The course makes extensive use of outside experts. Course is relevant for management- or policy-oriented students who will be working in, or interrelating with, public and private (both for-profit and not-for-profit) health insurance plans and organized delivery systems such as HMOs and hospital/physician integrated delivery systems. Course is also relevant to students who will be researching and analyzing these systems.

Course Objectives:

1. To understand the laws related to Hospitals in India.
2. To study various Health related issues and HR related laws as well as governance done by India Government.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
307I.1	Remember	STATE various Terms related to legal procedure for Hospital and Medical Services.
307I.2	Understand	DESCRIBE various concepts, terms for Inquest.
307I.3	Apply	MAKE USE of Laws related to Medical Procedures, Labour Laws applicable in Effective organization of Hospital and Medical Services.
307I.4	Analyze	RELATE the legal procedure, Inquest, Organizational and Procedural Laws to Hospital and Medical Services.
307I.5	Evaluate	SUPPORT various Laws related to Medical Procedures.
307I.6	Create	DESIGN a Hospital and Medical Services with the use of appropriate laws.

Course Contents:

Unit 1: Introduction and Legal Procedure

Court, Affidavit, Evidence, complaint, investigation, Oath, Offence, warrant, Summons. Medico Legal Aspects of Emergency Services. Rights and Responsibilities of Medical Person.

Unit 2: Inquest

Police Inquest, Magistrate's Inquest. Criminal Courts in India and Their powers, General Important Legal Knowledge Pertaining to IPC, CRPC, Civil PC, Evidence Act Hippocratic Oath, Declaration of Geneva.

Unit 3: Laws related to medical Procedures

Medical termination of Pregnancy Act 1971 (MTP Act), Prenatal diagnostic techniques, regulations and prevention of misuse Act 1994, Code of Medical Ethics, Medical negligence and

Compensation, Illustrative cases of medical Negligence in India.

Unit 4: Organisational and procedural Laws

Indian Contract Act, Nursing Home-Registration Act.

Unit 5: Labour Laws applicable to a hospital

Indian Trade Union Act 1926/Industrial Dispute Act 1947, The Workmen's Compensation Act, The Industrial Employment (standing orders) Act 1946, Maternity Benefit Act, Employee Provident, Payment of Wages Act.

Suggested Readings:

1. Parikh's Text Book of Medical Jurisprudence and Toxicology- By Dr. C.K. Parikh-CBS Publication.
2. Medical Negligence and Compensation – By Jagdish Singh- Bharat Law, Jaipur.
3. Medico-Legal Aid at Hospitals and Doctors with Consumer Protection aw- By M.S. Pandit and Shobha Pandit-Pandit Publications.

GBSRC MBA Syllabus

COURSE CODE	MB308I
COURSE TITLE	MANAGEMENT OF HOSPITAL INFORMATION SYSTEM
COURSE CREDITS	3

Course Description:

To make the students to understand MIS as a managerial decision making tool and to know the sources and compiling of MIS.

Course Objectives:

1. To train Medical and Non-Medical Graduates in the specialty of the Hospital Administration to meet the growing demand of Hospital Administrators at the middle level of management.
2. To enable such persons to take up consultancy in the Hospital Planning.
3. To enable them to take up higher courses of learning /specialization in the field of Hospital Management in due course of time.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
308I.1	Remember	DEFINE important Management Information Systems and Decision Making Process.
308I.2	Understand	EXPLAIN various concepts, functions, importance, benefits and challenges of Health records.
308I.3	Apply	MAKE USE of Telemedicine Technologies into Management of Hospital Information Systems.
308I.4	Analyze	COMPARE various software applications in Healthcare.
308I.5	Evaluate	SELECT an appropriate statistical test for solving the identified problems.
308I.6	Create	DESIGN a Hospital Management Information System.

Course Contents:

Unit 1: Introduction to Management Information Systems

Decision Making Process Techniques – Major Trends in Technology in Decision Making – Computerized data processing– Decision Support Systems – Expert System – Executive Information System – Health Management Information System.

Unit 2: Health Records

The World of Informatics The Future of healthcare technology - Functions of the health record – Changing functions of the patients record – privacy and confidentiality and Law – Advantages of the paper record – Disadvantages of the paper record – Optically scanned records – The Electronic health record – Automating the paper record – Advantages of the HER – Disadvantages of the HER – Bedside or point-of-care systems – Human factors and the HER – Roadblocks and challenges to HER implementation.

Unit: Telemedicine

Telehealth – Historical perspectives – Types of Technology – Clinical initiatives – Administrative initiatives – Advantages and Barriers of telehealth – Future trends – Summary – The Future of informatics; Globalization of Information. Technology – Electronic communication – Knowledge

management – Genomics – Advances in public health – Speech recognition – Wireless computing – Security – Telehealth – Informatics Education – Barriers to Information Technology implementation.

Unit 4: Software Applications in Health Care

Awareness on the application of computer software packages in various functions of hospital – Internet and Intranet and their application in healthcare.

Unit 5: Practicals of Software Applications

One way ANOVA using Statistical Software.

Suggested Practicals:

Mail Merge using MS Word Profit Analysis using Excel Vendor Analysis using Excel Lead Time Analysis using Excel Electricity billing using Excel Grade Analysis using Excel Budget Consumption using Excel Correlation using Statistical Software Regression using Statistical Software Chi-square using Statistical Software One Sample T Test using Statistical Software Two Sample T Test using Statistical Software Test of Significant difference- Independent Samples Test of significant difference.

Reference Books:

1. Green. E. Paul. Danald S. Tull, Gerald Albaum, Research for Marketing Decisions, Prentice Hall, New Delhi, 1996.
2. Ghosal, A., Elements of Operations Research, Hindustan Publishing Corporation, New Delhi, 1969.

GBSRC MBA Syllabus

COURSE CODE	MB309I
COURSE TITLE	QUALITY & ACCREDITATION IN HEALTHCARE SECTOR
COURSE CREDITS	3

Course Description: Quality management is a crucial need for healthcare organizations such as hospitals, nursing homes, clinics, and laboratories. This course enables healthcare managers and other health professionals in the implementation of quality management and continuous quality development in their settings. In health accreditation a standard is “a desired and achievable level of performance against which actual performance is measured”. Standards enable “health service organizations, large and small, to embed practical and effective quality improvement and patient safety initiatives into their daily operations”.

Course Objectives:

1. To provide comprehensive coverage of the theoretical and practical aspects as well as various tools and techniques of quality management system at different levels of healthcare delivery and various aspects of accreditation system prevalent in the country and abroad.
2. To enable healthcare managers and other health professionals in the implementation of quality management and continuous quality improvement in their settings.
3. To achieve healthcare managers and other health professionals a desired and achievable level of performance against which actual performance is measured.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom’s Level	Course Outcomes
309I.1	Remember	RECOGNIZE and RECALL theoretical and practical aspects as well as various tools and techniques of quality management system, at different levels of healthcare delivery.
309I.2	Understand	DESCRIBE various concepts, features, benefits of Healthcare Quality Management.
309I.3	Apply	MAKE USE of Process Approach to Quality Management in Hospitals.
309I.4	Analyze	RELATE Hospital and Health Services with the Quality Accreditation for Hospitals.
309I.5	Evaluate	SUPPORT the Hospital and Health services with Patient Satisfaction and Hospital Efficiency.
309I.6	Create	INVESTIGATE various process approaches to Quality Management in Hospitals under the Quality Accreditation Framework for Hospitals.

Course Outline:

Unit 1: Introduction to Healthcare Quality

Nature, role and concept of Healthcare Quality, Quality Management Theories, Quality Management Tools, Statistics in Quality, Quality in Healthcare Organizations, Development of Quality Manual , Consumer Protection Act and Quality, Stores and Equipment Management – Planning, Maintenance and Disposal – Equipment Audit, Quality Control – Total Quality Control.

Unit 2: Healthcare Quality Management

Patient Safety and Medical Errors, Dashboards and Scorecards, IT and Quality, National Health Programs of India, The Past, Present and Future of Healthcare Quality, Hospital Management Information System, Concepts, features, benefits and goals of TQM and Six-Sigma.

Unit 3: Evaluation Of Hospital & Health Services

Accreditation - Setting of objective - Health indicators - applying Economic concepts to Service Evaluation - Assessing Patient Satisfaction - Techniques of Hospital Service Evaluation - Indicators of Hospital Efficiency and Effusiveness - Evaluation of Quality of Hospital Services - Management of Hazard and Safety in Hospital Setup - Nursing Services in a Hospital - current - Issues in Hospital Management.

Unit 4: Process Approach To Quality Management In Hospitals

Process Management – Triple Role of Process Team – PDCA Cycle – Preparation of process flow diagrams for distinct processes in a hospital – Quality Aspects of processes in Hospitals Diagnostic services – Nursing services – House Keeping – Blood Bank – Pharmacy – OPD – Surgery – ICU – Emergency and Trauma care – Canteen – Hospital Stores, Quality Certification Systems.

Unit 5: Quality Accreditation In Hospitals

Overview of Accreditation System – NABH Accreditation Process – Procedure – Joint Commission International (JCI) – Mission – Benefits – Value – Accreditation in 15 Areas – JCI for primary care centers – JCI Accredited Hospitals in India – Basic Objectives of National Accreditation Board for Hospitals (NABH) – Standards of NABH – Documentation Procedure – Patient Rights and Education – Benefits of NABH to Hospital – Employees – Patients and TPA's.

Prescribed Books:

1. Spath, Patrice, 2013, Introduction to Healthcare Quality Management, 2nd Edition, Copyright 2013, Health Administration Press, Chicago, IL; ISBN 978-1-56793-593-6.
2. Health Planning For Effective Management - William A. Reinke, 1988, Oxford University Press.

Suggested Readings:

1. Health Sector Reform in Developing Countries - Peter Berman, Harvard University Press, 1995.
2. Health Policy and Management - The health care Agenda in a British political context - Colum Paton, 1996, Chapman & Hall Publication (Madras).
3. Quality Assurance & Methods, K.C.Poornima.

OPERATIONS AND SUPPLY CHAIN MANAGEMENT SPECIALIZATION

PSO-1: Demonstrate the Proficiency in Operations and Supply Chain Management domain like Operations Management, Total Quality Management, Project Management, Logistics and Supply Chain Management to support the various Business Functions.

PSO-2: To inculcate the ability to gain multidisciplinary knowledge through Case Analysis, Projects-Based Learnings, Internships, Industrial Visits, Corporate Sessions to support the Operations and Supply Chain Management.

COURSE CODE	MB303J
COURSE TITLE	INVENTORY MANAGEMENT
COURSE CREDITS	3

Course Description:

Inventory Management (IM) is concerned with the management of resources and activities about storing & usage of inventory at optimum level for customers. The course focuses on the inventory control techniques. The concept of efficient and effective operations inventory control.

Course Objectives:

1. To give an overview of various aspects of inventory.
2. To explain the impact of types of inventory costs on inventory management decisions.
3. To explain the principles of JIT.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
303J.1	Remember	STATE key concepts, theories & frameworks in the field of Inventory Management.
303J.2	Understand	EXPLAIN Just in Time & other methods of Inventory Management.
303J.3	Apply	MAKE USE OF theories & models to determine the Economic Order Quantity & Stock Levels.
303J.4	Analyze	COMPARE & CONTRAST between different techniques of Inventory Management.
303J.5	Evaluate	APPRAISE the various factors to arrive at Make or Buy decisions.
303J.6	Create	DEVELOP a computer solution to various EOQ models using MS Excel.

Course Outline:

Unit 1: Elements of Inventory Management

Inventory concepts, Impact of Low Inventory and High Inventory, Role of inventory in Operations,

Types of inventory – seasonal, cyclic, pipeline, Safety stock. Inventory costs – carrying costs, ordering costs, shortage costs.

Unit 2: Inventory Control systems

Continuous Review (Q) systems, Periodic Review (P) systems, ABC Classification system, Issues in the P and Q systems of inventory control, EOQ Model, JIT.

Unit 3:Economic Order Quantity Models

The Basic EOQ Model, Production Quantity Model, Computer Solution of EOQ model with MS Excel, Quantity Discounts, Computer Solution of Quantity Discounts model with MS Excel, Reorder Point, Safety Stocks, Service Level, Reorder point with variable demand, Computer Solution of Reorder point with MS Excel, Order quantity for periodic inventory system, Order quantity with variable demand, Computer Solution of fixed period model with MS Excel.

Unit 4:Just-In-Time

Principles of just-in-time, Core logic of JIT, Main features for stocks, Achieving just-in-time operations, Other effects of JIT, Benefits and disadvantages of JIT, Comparison with other methods of inventory management. KANBAN as a control tool. Vendor managed inventory.

Unit 5:Make or Buy Decisions

Factors influencing Make or Buy Decisions-cost, quality, capacity core v/s noncore, management strategy. Evaluation of performance of Materials function: cost, delivery, quality, inventory turnover ratio methodology of evaluation, Use of ratios and analysis like FSN: Fast slow, Nonmoving, HML-High Medium, Low, XYZ. Inventory Management in JIT Environment, Safety Stocks, Inventory Management Systems, MUSIC -3D.

Prescribed Books:

1. Purchasing and Inventory Management, by Sarika Kulkarni K. S. Menon.
2. Production and Operations Management by Shailendra Kale.

Suggested Readings:

1. Essentials of Inventory Management by Max Muller.
2. Increasing Retail Inventory Productivity: Secrets to optimizing inventory productivity by Prakash Menon and Andrew Cavanagh.

COURSE CODE	MB304J
COURSE TITLE	QUALITY MANAGEMENT
COURSE CREDITS	3

Course Description:

Quality Management has focusing on Quality and Standardisation aspects, self-certification. The course also deals the knowledge of TQM for business excellence. Quality management describes the importance of Service Quality Management in global, and ethical business practices. It also focuses on team building and achieving quality through quality values & policy.

Course Objectives:

1. To explain the meaning of total quality management and identify features of the TQM philosophy.
2. To understand the knowledge of TQM for business excellence.
3. To describe tools for identifying and solving quality problems.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
304J.1	Remember	RECALL the contribution made by various Quality Gurus.
304J.2	Understand	DESCRIBE Standards & Excellence Models for Quality.
304J.3	Apply	IMPLEMENT the Quality models and methods for problem solving.
304J.4	Analyze	INTEGRATING Service Quality Model SERQUAL
304J.5	Evaluate	APPRAISE the functions of various Quality certifications.
304J.6	Create	PLAN interrelated activities for Seven Old and New Tools of Quality.

Course Outline:

Unit 1: Introduction to Quality Management

Introduction to Quality Management: Definition, Evolution of Quality Management, Quality Gurus and their Contributions, Cost of Quality, Quality costs.

Unit 2: Designing Quality

Designing Quality into Products and Services (QFD, DFSS, Reliability, FMEA), Statistical Quality Control (Control Charts), Principles of TQM, Sampling, Operation Characteristics Curve, AQL, AOQL.

Unit 3: Aspects of Quality

Standards and Excellence Models for Quality, Experimental Design and Taguchi Method, transformational process quality, Design Quality and Manufactured Quality.

Unit 4: Service Quality Management

Seven Old and New Tools of Quality, Definition of 5S, Implementation of 5S, Service Quality Management, Human Factors in Quality, Quality Circles, Six Sigma, Theory of Constraint, Lean manufacturing, Gronroos Model, The gap model of Parasuraman –SERVQUAL Quality Strategy for Indian Industries.

Unit 5: Quality Certification

Evolution of ISO 9000 standard, Principles and objectives of ISO 9000 standard, Procedure for registration and certification of ISO 9000 Standards, ISO 9000 standard versus QS 9000, ISO 14001 :2004, ISO 45001 Training, OHSAS 18001 certification.

Prescribed Book:

1. Quality control & Total Quality Management by P.L. Jain, McGraw Hill Publications.
2. Production & Operations Management, Shailendra Kale, McGraw Hill Publications.

Suggested Readings:

1. Total Quality Management by N. Srinivasa Gupta, B. Valarmathi.
2. Total Quality Management by I. Suganthu, Anand Samuel, TMGH.
3. Total Quality Management Principles and Practices by S.K Mandal.

GBSRC MBA Syllabus

COURSE CODE	MB305J
COURSE TITLE	SERVICE OPERATIONS MANAGEMENT
COURSE CREDITS	3

Course Description:

Service Operations Management has focusing on service and manufacturing continuum. The course also deals with Service Positioning & Implications for Service Delivery Design and Service blue printing.

Course Objectives:

1. To understand the relevance of service operations principles.
2. To understand global markets relationship to Service Operations.
3. To address strategic analysis and operational decision-making process.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
305J.1	Remember	DEFINE the nature and CHARACTERISTICS of services and the services economy.
305J.2	Understand	DESCRIBE the understanding of services economy, its importance and pricing strategies.
305J.3	Apply	USE service blueprinting for mapping variety of real-life services processes.
305J.4	Analyze	COMPARE AND CONTRAST alternative locations and sites for variety of service facilities.
305J.5	Evaluate	JUDGE and EXPLAIN the servicescapes at variety of service facilities / organisations.
305J.6	Create	DESIGN flow process layouts for variety of services for an organization.

Course Outline:

Unit 1: Understanding Services Operations

Defining Service Operations, Global trends in Services in Services Sector; Changing paradigms in Competitiveness of services; Services-Manufacturing Continuum, Recent trends in manufacturing services, increased role of services in manufacturing sector.

Unit 2: Understanding Services Economy

Developing an overall vision for the service system, Pricing Strategies in Services. The primary economic activity is the provision of service, increased importance of the service sector in industrialized economies, a subscription pricing model.

Unit 3: Devising Services Design

Service Positioning & Implications for Service Delivery Design: Degree of Customer contact, divergence, customization; Service Blue Printing, Service Enhancement using internet Case such

as ITC eChoupal.

Unit 4: Performance Issues in Service Systems

Capacity issues in service systems: Notion of capacity, Capacity build up Strategies, Capacity Vs System performance, Services Supply Chain, The gap model of Parasuraman–SERVQUAL.

Unit 5: Service Facility and Process Flows

Environmental Psychology and Orientation, Servicescapes, Behaviors in Servicescapes, Environmental Dimensions of Servicescapes, Facility Design, Nature and Objectives of Service Organizations, Land Availability and Space Requirements, Flexibility, Security, Aesthetic Factors, The Community and Environment. Process Analysis, Types of Processes, Flowcharting, Gantt Chart, Process Terminology, Facility Layout, Flow Process Layout and the Work Allocation Problem, Job Shop Process Layout and the Relative Location Problem.

Prescribed Book:

1. Services Sector Management an Indian Perspective, C. Bhattacharjee.
2. Production & Operations Management, Shailendra Kale, McGraw Hill Publications.

Suggested Readings:

1. Operations Management for competitive advantage, Chase, Jacobs, Aquilano and Agarwal, TMGH, 13th Edition.
2. Service operations management - Improving service delivery, Robert Johnston, Graham Clark, Pearson Publication

GBS RC MBA Syllabus

COURSE CODE	MB306J
COURSE TITLE	OPERATIONS RESEARCH AND MANAGEMENT
COURSE CREDITS	3

Course Description :

Operations research helps in solving problems in different environments that need decisions. The module covers topics that include: linear programming, Transportation, Assignment, and CPM/MSPT techniques. Analytic techniques and computer packages will be used to solve problems facing business managers in decision environments

Course Objectives :

1. To familiarize the Operations Management concepts.
2. To introduce various optimization techniques with managerial perspective.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
306J.1	Remember	DEFINE the concepts and models associated with Operations Research and Management.
306J.2	Understand	DESCRIBE the different Operations Research tools required to achieve optimization in business processes.
306J.3	Apply	USE appropriate Operations Research tools to be used in business environment for effective decision support.
306J.4	Analyze	TEST real life business problem with the given constraints and examine them using different decision-making tools of operations Research and Management.
306J.5	Evaluate	APPRAISE the various facets of a business problem and develop problem solving ability.
306J.6	Create	FORMULATE various Business Problems in the present business scenario and investigate their solutions.

Course Contents:

Unit 1 : Introduction to Operations Management - Process Planning - Plant Location - Plant Layout - Introduction to Production Planning.

Unit 2 : Stages of Development of Operations Research- Applications of Operations Research- Limitations of Operations Research- Introduction to Linear Programming- Graphical Method- Simplex Method - Duality.

Unit 3 : Transportation Problem- Assignment Problem - Inventory Control - Introduction to Inventory Management - Basic Deterministic Models - Purchase Models - Manufacturing Models with and without Shortages.

Shortest Path Problem - Minimum Spanning Tree Problem - CPM/PERT - Crashing of a Project Network.

Unit 4 : Game Theory- Two Person Zero-sum Games -Graphical Solution of (2 x n) and (m x 2) Games - LP Approach to Game Theory - Goal programming - Formulations - Introduction to Queuing Theory - Basic Waiting Line Models: (M/M/1) :(GD/a/a), (M/M/C):GD/a/a).

Unit 5: Operations Strategy and Competitiveness: World of operations in 2020 – Operations

Management in the organizational chart - Operations as a service – Historical role of Operations Management – Current perspectives. Behavioral Operations Management. Operations Strategy and Competitive dimensions – Operations and Corporate Strategy – Strategic Fit – A framework for Operations Strategy in Manufacturing, Services.

[Note: Distribution of Questions between Problems and Theory of this paper must be 60: 40 i.e, Problem Questions: 60 % and Theory Questions : 40 %]

Suggested Books :

1. Operations Strategy -- David Walters – PalgraveMcMillan.
2. Kanishka Bedi, Production and Operations Management, Oxford, NewDelhi, 2007.
3. Panneerselvam, R, Operations Research, Prentice-Hall of India, New Delhi, 2002.
4. G.Srinivasan, Operations Research, PHI Learning, NewDelhi, 2010.
5. Tulsian and Pandey, Quantitative Techniques, Pearson, NewDelhi, 2002.
6. Vohra, Quantative Techniques In Management, Tata McGrawHill, NewDelhi, 2010.

GBSRC MBA Syllabus

COURSE CODE	MB307J
COURSE TITLE	LOGISTICS MANAGEMENT
COURSE CREDITS	3

Course Description :

Logistics Management is the part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements.

This course provides a practical, management perspective of the following areas of logistics: distribution, transportation, international logistics, inventory control, sustainable logistics practices, key performance indicators, supply chain finance, leadership in a supply chain role, and an introduction to logistics technology including RFID and ERP systems. The course is designed for students who have had little or no previous coursework or professional experience in logistics.

Course Objectives :

1. To introduce process and functions of logistics system.
2. To understand the major building blocks, functions, business process.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
307J.1	Remember	DEFINE scope, functions and role of logistics in the Supply chain.
307J.2	Understand	EXPLAIN nature and importance of warehousing, types of warehouses, and warehousing functions in logistics management.
307J.3	Apply	USE the techniques of inter modal logistics operations in transportation selection decision.
307J.4	Analyze	EXAMINE characteristics of indirect and special carriers.
307J.5	Evaluate	APPRAISE the functions of various IT tools in logistics management.
307J.6	Create	DESIGN a route planning any road transport between any two cities of India.

Course Contents:

Unit 1 : Introduction to logistics management

Definition, scope, functions, objectives - Integrated logistics management, role of logistics in the Supply chain - Logistics and customer service, Role of logistics in competitive strategy, Logistics organization and performance measurement, Basics of ERP –SAP – ORACLE.

Unit 2 : Inventory planning

Inventory costs, classifying inventory, Nature and importance of warehousing, types of warehouses, warehousing functions, warehouse layout and design. Material handling - objectives, guidelines and principles, selection of material handling equipments.

Packaging-role of packaging, packaging materials, consumer and industrial packaging, material handling efficiency.

Unit 3 : Transportation

Role of transportation in logistics, transportation selection decision, basic modes of transportation- Rail, Road, Water, Air, Pipeline- characteristics of different modes- transport economics - Inter modal operations.

Unit 4 : Containerization

Concept, types, benefits, Types of carriers- indirect and special carriers, Role of intermediaries- shipping agents, brokers- freight management- route planning Role of ports, ICDs, CONCOR - Global shipping options.

Unit 5 : Reverse logistics

Scope, design, e-logistics- logistics information system-application of IT in logistics- automatic identification technologies- bar coding, RFID, Logistics outsourcing- 3PL and 4PL, Global logistics- operational and strategic issues, Pricing and revenue management.

References:

1. Ailawadi C Sathish and Rakesh Singh, Logistics Management, Prentice Hall, India, 2005.
2. Agrawal D K, Textbook of Logistics and Supply Chain Management, Macmillan India Ltd, 2003.
3. Coyle et al. The Management of Business Logistics, Thomson Learning, 7th edition, 2004.
4. Bowersox Donald J, Logistical Management- The Integrated Supply Chain Process, Tata McGraw Hill, 2000.

GBSRC MBA Syllabus

COURSE CODE	MB308J
COURSE TITLE	SUPPLY CHAIN MANAGEMENT
COURSE CREDITS	3

Course Description :

Supply Chain Management is about the management of material, information, and finance flows in multi-stage production-distribution networks. Driven by fierce global competition and enabled by advanced information technology, many companies have taken initiatives to reduce costs and at the same time increase responsiveness to changes in the marketplace. This course will provide students with the knowledge and the tools necessary to develop, implement, and sustain strategies for managing supply chain issues. The topics include building a strategic framework to analyze supply chains, designing the supply chain network, planning demand and supply, managing inventories, sourcing, transporting, pricing and revenue management, and coordinating a supply chain.

Course Objectives:

1. To introduce process and functions of supply chain management.
2. To appreciate the design and network in supply chain management.
3. To understand the role of coordination in supply chain management.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
308J.1	Remember	STATE the concept, objectives and importance of Supply Chain Management.
308J.2	Understand	DESCRIBE the Strategic Approach in Managing Logistics under Supply Chain management.
308J.3	Apply	DEMONSTRATE the factors influencing distribution networks.
308J.4	Analyze	RELATE Strategic Approach in Managing Logistics Supply Chain.
308J.5	Evaluate	APPRAISE the impact of the supply chain coordination using Bullwhip effect .
308J.6	Create	DESIGN a hypothetical model for Bullwhip effect.

Course Contents:

Unit 1 : Introduction to Supply Chain Management

Supply chain – objectives – importance – decision phases – process view – competitive and supply chain strategies – achieving strategic fit- supply chain drivers – obstacles – framework – facilities – inventory – transportation – information – sourcing – pricing. Concept of Supply Chain Visibility.

Unit 2 : Designing the Supply Chain Network

Designing the distribution network – role of distribution – factors influencing distribution – design options – e-business and its impact – distribution networks in practice – network design in the supply chain – role of network – factors affecting the network design decisions – modeling for supply chain.

Unit 3 : Planning Demand and Supply

Role of forecasting – demand forecasting – approaches – role of IT. Planning and Managing Inventories- Safety inventory and its appropriate level – impact of supply uncertainty, aggregation and replenishment policies.

Unit 4 : Strategic Approach in Managing Logistics Supply Chain

Logistics Outsourcing- Need/ Benefits of Logistics Outsourcing, Clearing and Forwarding Agent –Cand F Agent, Third –Party Logistics (3PL), Fourth – Party Logistics (4PL), Procurement – Manufacturing-Logistical Interface, Quality tool kit for managers, Sales and Opération Planning

Unit 5 : Coordination in a Supply Chain

Lack of supply chain coordination and the Bullwhip effect – obstacle to coordination – managerial levels – building partnerships and trust – continuous replenishment and vendor-managed inventories – collaborative planning, forecasting and replenishment.

Information Technology framework: Information System Functionality-Comprehensive Information System Integration-Communication Technology- Rationale For ERP Implementation-ERP System Design-Supply Chain Information System Design.

References

1. Sunil Chopra and Peter Meindl, Supply Chain Management – Strategy, Planning and Operation, PHI, 4th Edition, 2010.
2. Wisner, Keong Leong and Keah-Choon Tan, Principles of Supply Chain Management A Balanced Approach, Thomson Press, 2005.
3. Coyle, Bardi, Longley, The Management of Business Logistics – A Supply Chain Perspective, Thomson Press, 2006.
4. Gattorna J L and Walters D W, Managing The Supply Chain – A Strategic Perspective, Palgrave1996.
5. Sahay B S, Supply Chain Management In The Twenty-First Century, Macmillan2000.
6. Jeremy F Shapiro, Modeling The Supply Chain, Thomson duxbury2002.
7. Mohanty R P, Deshmukh S G, Supply Chain Management, Theories And Practices, biztantra.

COURSE CODE	MB309J
COURSE TITLE	OPERATIONS STRATEGY
COURSE CREDITS	3

Course Description:

Operations Strategy (OS) is concerned with the strategic management of resources and activities that produce and deliver goods and services for customers. The course focuses on the basic concepts, interdependence of the operating strategy with other key functional areas of the firm.

Course Objectives:

1. To understand the strategic role of operations management.
2. To understand the role of operations strategy in the overall business strategy of the firm.
3. To identify and evaluate comparative approaches to operations strategy in a global context.
4. To understand the interdependence of the operating strategy with other key functional areas of the firm.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
309J.1	Remember	DEFINE the concept of operation strategy and operation strategy matrix in global economy.
309J.2	Understand	DESCRIBE the process of technology strategy.
309J.3	Apply	INTERPRET the quality as a strategic factor in process technology.
309J.4	Analyze	EAMINE the Technology strategy issues in new product development.
309J.5	Evaluate	APPRAISE the effectiveness of operations strategy for business solutions.
309J.6	Create	DEVELOP an Operations Strategy plan for Toothbrush (Product) for deciding Make or Buy.

Course Outline:

Unit 1: Introduction to Operations Strategy

The content of operations strategy – an overview, The operations strategy matrix. The overall level of operations capacity, Operations function and operations strategy interrelations. Interdependence of the operating strategy with other key functional areas of the firm. Plant Capacity, Location and linkage with corporate strategy, Operation strategy in global economy.

Unit 2: Process Technology Strategy

The capacity of each unit of technology, Degree of automation/analytical content, Degree of coupling/connectivity, the product–process matrix, Evaluating process technology. Evaluating various trade-offs alternatives – Focused manufacturing – Product or process focus – Make or Buy – merits /demerits – Value Chain approach – Just in Time – Jidhoka – Quality as strategic factor.

Unit 3: Sustainable Operations Strategy

Operations strategy and its sustainable alignment over time, Formulation process & its achievements, Analysis for formulation, Formulation models for alignment, The challenges to

operations strategy formulation substitutes for strategy, New approaches to operations, Total Quality Management (TQM), Lean Manufacturing, Business Process Reengineering (BPR), Enterprise Resource Planning (ERP), Six Sigma, 5S technique.

Unit 4: Dynamic Markets & Generic Strategies

Technology strategy issues in new product development -time to market- strategic nature of process business implication of process choice Hybrid process. Change management, sustainability and Green Manufacturing.

Unit 5: Operations Strategy Implementation

Evaluating various trade-offs alternatives – Focused manufacturing – Product or process focus – Make or Buy – merits /demerits, Development and improvement in operations strategy, Setting the direction, role of performance mapping, Case studies in Indian context.

Prescribed Book:

1. Manufacturing Operations Strategy: Texts and Cases, Terry Hill 3ed. Palgrave Macmillan.
2. Operations Management for competitive advantage, Chase, Jacobs, Aquilano and Agarwal, TMGH, 13th Edition.
3. Production & Operations Management, Shailendra Kale, McGraw Hill Publications.

Suggested Readings:

1. Nigel Slack and Michael Lewis (2010): Operations Strategy, Pearson Education.
2. Sara L. Beckman, Donald Barry Rosenfield, Operations Strategy, McGraw-Hill Higher Education.
3. Global Operations Strategy: Fundamentals and Practice: Springer; 2013 edition.

BUSINESS ANALYTICS SPECILAIIZATION

PSO-1: Demonstrate the Proficiency in Descriptive, Predictive and Prescriptive Analytics to optimally solve the business problems.

PSO-2: To inculcate the ability to gain multidisciplinary knowledge through Simulated Problems, Case Analysis, Projects-Based Learnings, Internships, Industrial Visits, Corporate Sessions, to support the various Business Functions.

COURSE CODE	MB303K
COURSE TITLE	WORKFORCE ANALYTICS
COURSE CREDITS	3

Course Description:

Workforce Analytics is a data-driven approach to managing people at work. Workforce analytics, also known as HR analytics, People analytics, or Talent analytics, revolves around analyzing people problems using data to answer critical questions about your organization. This enables better and data-driven decision-making.

Course Objectives:

1. To ENUMERATE the use of Workforce Analytics.
2. To UNDERSTAND the process of creating and using HR analytics.
3. To USE dashboards, pivot tables for data driven decision making in HR.
4. To ILLUSTRATE the use of various tools and frameworks for predictive analytics.
5. To BUILD and DERIVE a variety of metrics and quantify key outcomes in multiple areas of HR.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
303K.1	Remembering	To ENUMERATE the use of Workforce Analytics.
303K.2	Understanding	To UNDERSTAND the process of creating and using HR analytics
303K.3	Applying	To USE dashboards, pivot tables for data driven decision making in HR.
303K.4	Analysing	To ILLUSTRATE the use of various tools and frameworks for predictive analytics
303K.5	Evaluating	DERIVE a variety of metrics and quantify key outcomes in multiple areas of HR
303K.6	Creating	BUILD value for HR departments by showing clear links between HR and Business outcomes

Course Outline:

Unit 1: Workforce Analytics – Overview: Workforce Analytics: definition, evolution, function of

Workforce analytics, Use of Workforce / People / HR metrics to measure results in HR - Process vs Outcome, Efficiency vs Effectiveness, Lead vs Lag, challenges in measuring human capital, HR Business Framework, Concept of Balanced Score Card, identifying key workforce questions, Strategic Case for Workforce Analytics, Data Sources, Power of combining data sources, Good, Important & Key Metrics.

Unit 2: Recruitment Metrics: Fill-up ratio, Time to hire, Cost per hire, Early turnover, Termination during probation, Channel efficiency mix in terms of Direct hires, Employee referral hires, Agency hires & Lateral hires, Offer reject and renege, Fulfilment ratio, Quality of hire, Recruitment to HR cost. Diversity Metrics: Workforce diversity index, Gender mix, Differently abled index, Implementation challenges.

Unit 3: Talent Metrics: Retention index, Voluntary and involuntary turnover, Turnover by department, grades, performance, and service tenure, Internal hired index. Learning & Development Metrics: Training need identification, Make or Buy Model, Training effectiveness evaluation, Percentage of employee trained, Internally and externally trained, Training hours and cost per employee, ROI calculation. Learning & Development Metrics: Training need identification, Make or Buy Model, Training effectiveness evaluation, Percentage of employee trained, Internally and externally trained, Training hours and cost per employee, ROI calculation.

Unit 4: Internal Mobility Metrics: Career Progression Indices - Promotion index, Rotation index, Career path index, Level wise succession readiness index. Internal Mobility Metrics: Career Progression Indices - Promotion index, Rotation index, Career path index, Level wise succession readiness index. People Deployment Metrics: Employees per Manager, Employee service profiling, Workforce age profiling, Workforce service profiling, Churn index, Separation clearance time.

Unit 5: HR Cost Metrics: Revenue per employee, Operating cost per employee, PBT per employee, HR cost per employee, HR to operating cost, Compensation to HR cost, HR budget variance, HR ROI. HR KPI Dashboard: Calculating HR KPI, Scorecard based on recruitment, training and development, Calculating HR KPI, Scorecard based on employee retention, and turnover. HR Predictive Analytics: Regional and country level differences in turnover data, predicting individual and team turnovers, Turnover costs for business implications, Selection decisions from previous performance data, Predictive modelling of individual and team performance, Identifying flight-risk candidates, Report generation.

Prescribed Books:

1. Winning on HR analytics: Leveraging data for competitive advantage, Ramesh Soundararajan and Kuldeep Singh, Sage Publication.
2. The Practical Guide to HR Analytics: Using Data to Inform, Transform, and Empower HR Decisions Paperback, Shonna D. Waters, Valerie N. Streets, Lindsay McFarlane, Rachael Johnson-Murray.
3. Human Capital Analytics: How to Harness the Potential of Your Organization's Greatest Asset, Boyce Byerly, Gene Pease, and Jac Fitz-enz.

Suggested Reading:

1. Doing HR Analytics: A Practitioner's Handbook with R Examples, Lyndon, Mr. Sundmar, CreateSpace Independent Pub.
2. The Power of People: Learn How Successful Organizations Use Workforce Analytics to Improve Business Performance, Guenole Nigel, Ferrar Jonathan, Feinzig Sheri, Pearson Publication.

GBSRC MBA Syllabus

COURSE CODE	MB304K
COURSE TITLE	ANALYTICS FOR MARKETING
COURSE CREDITS	3

Course Description:

Analytics in Marketing comprises the processes and technologies that enable marketers to evaluate the success of their marketing initiatives. This is accomplished by measuring performance (e.g. blogging versus social media versus channel communications). Marketing analytics uses important business metrics, such as ROI, marketing attribution and overall marketing effectiveness. In other words, it tells you how your marketing programs are really performing.

Course Objectives:

1. To DESCRIBE the use of Voice of the Customer data in making data driven marketing decisions.
2. To DEMONSTRATE an understanding of utility theory to measure customer preferences and choices.
3. To IDENTIFY what customers’ value in a product and assess what they are willing to pay for it.
4. To ILLUSTRATE the use of various tools and frameworks to solve strategic marketing problems using marketing data.
5. To DETERMINE and DESIGN the most effective target markets.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom’s Level	Course Outcomes
304K.1	Remembering	To DESCRIBE the use of Voice of the Customer data in making data driven marketing decisions.
304K.2	Understanding	To DEMONSTRATE an understanding of utility theory to measure customer preferences and choices.
304K.3	Applying	To IDENTIFY what customers’ value in a product and assess what they are willing to pay for it.
304K.4	Analysing	To ILLUSTRATE the use of various tools and frameworks to solve strategic marketing problems using marketing data.
304K.5	Evaluating	DETERMINE the most effective target markets.
304K.6	Creating	DESIGN a study that incorporates the key tools of Marketing Analytics.

Course Outline:

Unit 1: Segmentation Analytics

Market Segmentation Variables, Market Segmentation Types, Marketing Data Landscape, Data for Segmentation, Analytics for Need Based Segmentation - Voice of the Customer, managing “Voice of the Customer” Data, Customer Co-Creation, RFM Analysis, Life Cycle Segmentation,

Cross Tabulation Segmentation, Regression based segmentation, Clustering, Conjoint Analysis Segmentation, The Cluster Analysis + Discriminant Analysis Approach.

Unit 2: Approaches to Choosing Target Segment/s

Rationale for Segment Targeting, Analytics for Perceptual Mapping and Product Positioning, Product Positioning, Multi-Dimensional Scaling (MDS) and Factor Analysis, Relevance of Mapping for Product Positioning, Preference Mapping, Incorporating Preferences in Perceptual Mapping. Analytics for Product/Service Design: The Relevance of Trade-off Approaches, Conjoint Analysis, Approaches to Conjoint Analysis, Interpreting Conjoint Results, Optimizing Design using Conjoint Results.

Unit 3: Analytics on Forecasting and Pricing Analytics

Forecasting- Correlation, Simple Regression and Multiple Regression to forecast sales, Modelling Trend and Seasonality, Ratio to Moving Average Method, Forecasting New Product sales -Using 'S' curves, Concepts-The Bass diffusion model, The Copernican principle to predict duration. Pricing Analytics - Optimization, Practical applications of price analytics, ROI concept, Consumer preference, choice, Conjoint Analysis, Logistic regression.

Unit 4: Analytics for Tracking Customer Growth

Rationale for Customer Analytics, Customer acquisition cost, Customer Churn, Customer Attrition models, Customer lifetime value, Net promoter score, Calculating the number of new customers, Calculating average customer age & Days to convert, Calculating customer acquisition cost & Average purchases, Calculating touch points & Lead conversion, Analysing age demographics, First contact with customer, Customer satisfaction, Understanding customer engagement, Diffusion Models - The Bass Model.

Unit 5: Modelling New Marketing Initiatives

Introduction to modelling, evaluating new ad channels, Modelling tips and best practices, Projecting ad revenue, Projecting organic follower revenue, Projecting expenses, Calculating net profit and breakeven, Understanding ROI, Calculating returns, Creating a single-variable sensitivity table, Creating a multi-variable sensitivity table.

Prescribed Books:

1. Marketing Analytics by Wayne L. Winston, Publisher – John Wiley & Sons Inc.
2. Business Analytics by U. Dinesh kumar, Publisher – John Wiley & Sons.
3. Data Mining Techniques in CRM by Konstantinos K. Tsipitsis, Antonios Chorianopoulos – Publisher – John Wiley & Sons.

Suggested Reading:

1. Marketing Analytics: Data-Driven Techniques with Microsoft Excel, Wayne L. Winston.
2. Data Science for Marketing Analytics: Achieve your marketing goals with the data analytics power of Python by Tommy Blanchard, Debasish Behera, et al. | Mar 30, 2019.
3. Python for Marketing Research and Analytics Marketing Analytics: A Practical Guide to Improving Consumer Insights Using Data Techniques by Mike Grigsby.

COURSE CODE	MB305K
COURSE TITLE	RETAIL ANALYTICS
COURSE CREDITS	3

Course Description:

Retail analytics is any information that allows retailers to make smarter decisions and manage their businesses more effectively. Retail analytics can identify your best customers and where they live and predict future spending.

Course Objectives:

1. To ENUMERATE the characteristics, opportunities and challenges of New Age Retailing, Digital Consumers Dynamics, List the data required for retail analytics.
2. To UNDERSTAND Consumer Buying Behavior and Trends in new age retailing.
3. To USE various kinds of data and tools for performing Retailing Analytics.
4. To ILLUSTRATE the use of various tools and frameworks for predictive retail Analytics.
5. To BUILD and DERIVE a variety of metrics and quantify key outcomes in multiple areas of Retail and value for Retail and Marketing by deriving Marketing ROI metrics respectively.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
305K.1	Remembering	To ENUMERATE the characteristics, opportunities and challenges of New Age Retailing, Digital Consumers Dynamics, List the data required for retail analytics.
305K.2	Understanding	To UNDERSTAND Consumer Buying Behavior and Trends in new age retailing.
305K.3	Applying	To USE various kinds of data and tools for performing Retailing Analytics
305K.4	Analysing	To ILLUSTRATE the use of various tools and frameworks for predictive retail Analytics.
305K.5	Evaluating	DERIVE a variety of metrics and quantify key outcomes in multiple areas of Retail.
305K.6	Creating	BUILD value for Retail and Marketing by deriving Marketing ROI metrics.

Course Outline:

Unit 1: Retailing Analytics

An Introduction- Retailer Goodwill, Retail Organization (Real Estate Marketing, Creative Advertising Marketing, Marketing Research, Strategic Marketing), Communicating to Retail Organization, Point of Sale Vs Market Basket Data, Data is Gold, Data is Revenue: The Price of Retail Data.

Unit 2: Retail and Data Analytics

Market Basket, Data Storage, Data without is Overhead, Case studies and practical examples of

data related: Retail Projects, Trade Area Modelling, Real Estate Site Selection Modelling, Competitor Threat Analytics, Merchandise Mix Modelling: Combining Multiple Data Sources, Celebrity Marketing: Tracking Effectiveness, House Brand Vs Name Brand, Affinity Merchandising: Merchandising Cross Cell Case Study, Store Departmental Cross Celling, Single category affinity Analysis (Paper Towels).

Unit 3: In-Store Marketing and Presentation

Understanding the different Store Designs, Old and New theories of Merchandise Placement, All about Pricing: Everyday Low Price, Loyalty Discount Philosophies, Tiered Pricing, Types and Size: Retail Store Strategies, Store in store, What's in Store: Convenience Store to Hyper-mart Stores, Warehouse Clubs, Shopping by Design: Traffic Patterns- Category Management, Merchandise Placement, Speciality Departments, Receiving Dock, Stocking the Counters, In-Store Media: Advertising or just displays? , Receipt Messages, In-Store Events, Holidays, Analytics: Tracking a Moving Tegets, Marketing Outside of Store.

Unit 4: Store Operations and RetailData

Setting up Store for Success Strategic uses of Data, Labour Forecasting, The Cost of doing Business, Consumer Differentiation at the point of sale Register, Heating and Cooling: Centralized Thermostats, Intra-store Communication, Replenishment and POS Sales (Cause and Effect), In-Store Career Path- (Stock Person to Store Manager).

Unit 5:Loyalty Marketing

Loyalty Programs, Total Programme Incentive, Consumer Finance Credit Card Retail Perspective, Loyalty Segments, Loyalty at POS, social Media.

Prescribed Books:

1. Retail Analytics — The Secret Weapon, Emmett Cox
2. Business Analytics for Managers Wolfgang Jank Springer Science+Business Media, LLC 2011
3. Business Analytics in Retail For Dummies, © 2ndIBM Limited Edition by Jennifer Le Claire, Danielle Dahlstrom, and Vivian Braun, John Wiley & Sons, Inc.
4. The Predictive Retailer, ANDREW PEARSON, Intelligencia Limited
5. Behavior Analytics in Retail, Ronny Max 6. The Little Book on Big Data: Understand Retail Analytics Through Use Cases and Optimize Your Business, MahoganyBeckford

Suggested Reading:

1. Retail Survival of the Fittest 7 Ways to Future-Proof Your Retail Store. Francesca Nicasio
2. Data Analysis and Decision-Making S. Christian Albright. Wayne L. Winston 5thEdition Cengage Learning

COURSE CODE	MB306K
COURSE TITLE	ANALYTICS FOR BUSINESS FUNCTIONS
COURSE CREDITS	3

Course Description :

In this course, student will learn to identify, evaluate, and capture business analytic opportunities that create value. Toward this end, students will learn basic analytic methods and analyze case studies on organizations that successfully deployed these techniques. In the first part of the course, we focus on how to use data to develop insights and predictive capabilities using machine learning, data mining and forecasting techniques. In the second part, we focus on the use of optimization to support decision-making in the presence of a large number of alternatives and business constraints. Finally, throughout the course, we explore the challenges that can arise in implementing analytical approaches within an organization.

Course Objectives:

1. To build data models to analyse market potential, use historic data to quantify strategic milestones.
2. To conceptualise review mechanisms to measure performance against established objectives.
3. To exploit synergies between various departments to jointly contribute to organisational growth.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
306K.1	Remembering	Students will be able to IDENTIFY key metrics and contribution of each business function.
306K.2	Understanding	Students will be able to UTILIZE marketing analytics to measure brand and customer assets
306K.3	Applying	Students will be able to make USE of marketing analytics to predict outcomes and systematically allocate resources.
306K.4	Analysing	Students will be able to EVALUATE and optimize marketing campaigns as per market trend.
306K.5	Evaluating	Students will be able to do the ASSESSMENT of employee satisfaction and retention.
306K.6	Creating	Students will be able to CREATE financial medeling to understand the financial performance.

Course Contents:

Unit 1 : Measurement of Organisational Performance

Identifying key metrics, Contribution of each business function (e.g. Marketing, Finance, HR, Operations), Planning and forecasting, evaluating the performance of an organisation, Balanced Score Card.

Unit 2: Customer Analytics

Customer Acquisition Cost, Customer LifeTime Value (CLV/CLTV), Point of Sales (PoS) Data collection and collation, Market Basket Analysis, Product Affinities, Loyalty Programs, Digital

Marketing, SEO vs SEM, Web Analytics.

Unit 3: Financial Analytics

Financial Modelling, Financial Portfolio Analysis and Risk Management, Planning and Budgeting, Fraud detection, Actuarial science, measuring Credit Score and establishing qualifier criteria, Loan Asset Management.

Unit 4: People Analytics

HR's value proposition, benchmarking of relevant success factors on the basis of individual Industry Standards, HR Policy definition process, measurement of compliance, implementing procedures and guidelines, assessment of employee satisfaction and retention.

Unit 5: Process Optimisation

Measuring throughput, establishing vital metrics for evaluating efficiencies, Business Process Re-engineering to improve efficiency, Cost Saving initiatives, reducing Time-to-Market, predict operational fault and failures, schedule Preventive Maintenance.

Prescribed Books:

1. R.S.N. Pillai, V. Bagavathi," Statistics", S. Chand Limited, 7th Ed, 2008.
2. N.D. Vohra, "Business Statistics", Tata McGraw-Hill Education, 2nd Ed, 2013.
3. G. V. Shenoy, Uma K. Srivastava, S. C. Sharma," Business Statistics", New Age International, 2nd Ed, 2005.
4. Beri,"Business Statistics"TataMcGraw Hill, 2nd Ed, 2009.

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COURSE CODE	MB307K
COURSE TITLE	PERFORMING ANALYTICS WITH PYTHON
COURSE CREDITS	3

Course Description :

Learn how to analyze data using Python. This course will take you from the basics of Python to exploring many different types of data. You will learn how to prepare data for analysis, perform simple statistical analysis, create meaningful data visualizations, predict future trends from data, and more!

Course Objectives:

1. To become industry ready by building applications using the Python platform.
2. To learn the semantics of Python software and apply statistical models for Business Analytics.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
307K.1	Remembering	Students will be able to RECOGNIZE the Phthon environment.
307K.2	Understanding	Students will be able to INTERPRET data behavior related to various Financial Transactions.
307K.3	Applying	Students will be able to DISCOVER the interplay of financial data during the various functions of Finance.
307K.4	Analysing	Student can IMPLEMENT various Autoregressive Models.
307K.5	Evaluating	Students will be able to EVALUATE linear algebra and integration.
307K.6	Creating	Students will be able to DRAW line plots, scatter plots, histogram etc.

Course Contents:

Unit 1: Introduction to Python environment

Python 2 and Python 3, Jupyter Notebooks, PyCharm IDE, navigation controls, input and output commands, understanding data types, data manipulation, summary calculations.

Unit 2: NumPy

Data creation, Arrays, indexing and slicing, concatenation and splitting, aggregates, broadcasting, sort, data structures.

Unit 3: Pandas

Data manipulation, Objects, Series, DataFrames, handling missing data, combining data sets (concat, append, merge, join), Pivot Tables, Vectorised String Operations, Time Series.

Unit 4: Matplotlib

Data visualisation, setting Styles, Line Plots, Scatter Plots, Histograms, Customising plots, multiple plots.

Unit 5: SciPy

Linear algebra, optimisation, integration, statistics.

Prescribed Books:

1. Mastering Python for Data Science- Samir Madhavan.
2. Python for Data Analysis – Andreas Muller and Sarah.
3. Introduction to Device Studying with Python.
4. Think Stats: Probability and Statistics for Programmers.
5. Probabilistic Development and Bayesian Methods for Hackers.
6. Understanding Machine Learning: From Theory to Algorithms.

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COURSE CODE	MB308K
COURSE TITLE	MACHINE LEARNING WITH R PROGRAMMING
COURSE CREDITS	3

Course Description :

This course will cover the basic algorithm that helps us to build and apply prediction functions with an emphasis on practical applications. Students, at the end of this training, will be technically competent in the basics and the fundamental concepts of Machine Learning.

Course Objectives:

1. To understand and practice big data analytics and machine learning approaches, which include the study of modern computing big data technologies and scaling up machine learning techniques focusing on industry applications.
2. To conceptualize and summarize of big data and machine learning, trivial data versus big data, big data computing technologies, machine learning techniques, and scaling up machine learning approaches.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
308K.1	Remembering	Students will be able to RECOGNIZE the R platform
308K.2	Understanding	Students will be able to UNDERSTAND, visualize, and perform statistical tests on HR data through a series of HR analytics case studies
308K.3	Applying	Students will be able to CALCULATE linear regression.
308K.4	Analysing	Students will be able to POINT OUT clustering.
308K.5	Evaluating	Students will be able to CRITICIZE and summarize data, present clear evidence of its findings, and tell engaging stories all through data graphics.
308K.6	Creating	Students will be able to CONSTRUCT a sentiment analysis.

Course Contents:

Unit 1: Programming with R

R, CRAN, RStudio, Libraries, Data Sets, Objects and Operation, Basic Data Structures, Vectors, Arrays, Matrices, Lists, Data Frames, Built-in functions, User defined functions, controlling code flow.

Unit 2: Machine Learning Fundamentals

Steps of Machine Learning, Types of Machine Learning, examples from key industries (e.g. Retail, BFSI, Pharma, Travel and Hospitality), Logistic Regression.

Unit 3: Supervised Machine Learning

Classification, Linear Regression, K-Nearest Neighbours, Support Vector Machines (SVM), Classification and Regression Trees (CART).

Unit 4: Unsupervised Machine Learning

Clustering, Association Rule Learning, Apriori, K-means.

Unit 5: Case Studies in ML

Predicting Customer Shopping Trends, Recommendation Engines (e.g. online news, products on eCommerce portal, content on entertainment apps), Credit Risk Detection and Prediction, Social Media Analysis, Sentiment Analysis – Subjectivity, Sentiment Polarity, Opinion summarisation, Feature extraction.

Prescribed Books:

1. T. Hastie, R. Tibshirani, and J. Friedman. The Elements of Statistical Learning. Springer 2011.
2. Kevin P. Murphy. Machine Learning: A Probabilistic Perspective, MIT Press 2012.
3. Christopher M. Bishop. Pattern Recognition and Machine Learning, Springer 2007.
4. S. Haykin. Neural networks and learning machines. Pearson 2008.

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COURSE CODE	MB309K
COURSE TITLE	DESCRIPTIVE ANALYTICS (USING TABLEAU)
COURSE CREDITS	3

Course Description:

Descriptive Analytics is the examination of data or content, usually manually performed, to answer the question “What happened?” (Or “What is happening?”), characterized by traditional business intelligence (BI) and visualizations such as pie charts, bar charts, line graphs, tables, or generated narratives.

Tableau is a data analytics and visualization tool used widely in the industry today. Tableau's ease of use comes from the fact that it has a drag and drop interface. This feature helps to perform tasks like sorting, comparing and analyzing, very easily and fast. Tableau is also compatible with multiple sources, including Excel, SQL Server, and cloud-based data repositories which makes it an excellent choice for Data Scientists.

Course Objectives:

1. To define Tableau terminology and show how to connect to data, Edit and save a data source.
2. To illustrate the use of the Tableau interface to effectively create powerful visualizations and charts.
3. To make use of descriptive statistical techniques to analyze data, parameters, and input controls to give users control over certain values.
4. To integrate data sources using data blending and Combine data from multiple tables in the same data source using joins. And to create basic calculations including basic arithmetic calculations, custom aggregations and ratios, date math, and quick table calculations.
5. To build spatial visualizations of non-geographic data by using advanced geographic mapping techniques and custom images and geocoding.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
309K.1	Remembering	To Define Tableau terminology and show how to connect to data, Edit and save a data source.
309K.2	Understanding	Describe various concepts and features related to Descriptive Analytics and Tableau
309K.3	Applying	To make USEof descriptive statistical techniques to analyze data, parameters, and input controls to give users control over certain values.
309K.4	Analysing	To integrate data sources using data blending and Combine data from multiple tables in the same data source using joins
309K.5	Evaluating	To illustrate the use of the Tableau interface to effectively create powerful visualizations and charts.
309K.6	Creating	DESIGN a study that incorporates the key tools of Tableau used for Descriptive Analytics.

Course Outline:

Unit 1: Data Connections:

Tableau terminology, Tableau interface/paradigm, Create and save data connections, Create a live connection to a data source, Explain the differences between using live connections versus extracts, Create an extract, Save metadata properties in a .TDS, Modify data connections, Add a join, Add a blend, Add a union, Manage data properties, Rename a data field, Assign an alias to a data value, Assign a geographic role to a data field, Change data type for a data field (number, date, string, boolean, etc.), Change default properties for a data field (number format, aggregation, color, date format, etc.)

Unit 2: Organizing and Simplifying Data:

Organize data and apply filters, Filter data, Sort data, Build groups, Build hierarchies, Build sets, Add a filter to the view, Add a context filter, Add a date filter, Apply analytics to a worksheet, Add a manual or a computed sort, Add a reference line or trend line, Use a table calculation.

Unit 3: Field & Chart Types:

Discrete v. continuous, Measure Names and Measure Values, Generated Fields, Use bins and histograms, Heat maps, Tree maps, Bullet graphs, bar chart, line chart, stacked bar, Combined Axis Charts, Dual Axis Charts, Scatter Plots, Data Highlighter, Cross tabs, Motion charts, Bar in bar charts, Box plots, Gantt Bar Charts, Paretos, Sparklines, geocoding, spatial visualizations of non-geographic data, Using titles, captions and tooltips, Editing axes, Mark labels and annotations.

Unit 4: Calculations:

Manipulating string and date calculations, Create quick table calculations, Use LOD calculations; types of LOD calculations, Use Ad-hoc calculations, Work with aggregation options, Build logic statements, Build arithmetic calculations, Build grand totals and sub-totals, Use calculations in join clauses, Create a calculated field (e.g. string, date, simple arithmetic), Add a parameter.

Unit 5: Sharing Insights:

Format view for presentation, Use color, Use bolding, Use shapes, Change size of marks, Select fonts, Create and modify a dashboard, Create a dashboard layout, Add interactive or explanatory elements, Add dashboard actions, Modify existing dashboard layout for mobile devices, Create a story using dashboards or views, Share a twbx as a PDF, Share a twbx as an image.

Prescribed Books:

1. Mastering Tableau, David Baldwin.
2. Communicating Data with Tableau: Designing, Developing, and Delivering Data Visualizations, Ben Jones.
3. Learning Tableau, Joshua N. Milligan.
4. Practical Tableau: 100 Tips, Tutorials, and Strategies from a Tableau Zen Master, Ryan Sleeper.

Suggested Reading:

1. Information Dashboard Design: Displaying Data for At-a-glance Monitoring by Stephen Few.
2. Beautiful Visualization, Looking at Data Through the Eyes of Experts by Julie Steele, Noah Iliinsky.
3. The Accidental Analyst: Show Your Data Who's Boss by Eileen and Stephen McDaniel.
4. The Visual Display of Quantitative Information by Edward R. Tufte.

COURSE CODE	MB310
COURSE TITLE	INTRODUCTION TO CYBER SECURITY
COURSE CREDITS	1

Course Description:

Introduction to Cyber Security was designed to help students develop a deeper understanding of modern information and system protection technology and methods. The learning outcome is simple: We hope students will develop a lifelong passion and appreciation for cyber security, which we are certain will help in future endeavors. Students, developers, managers, engineers, and even private citizens will benefit from this learning experience. Special customized interviews with industry partners were included to help connect the cyber security concepts to live business experiences.

Course Objectives:

1. To give basic understanding about system security.
2. To understand the salient facets of information security basics and the basics of risk management.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
310.1	Understanding	Students will be able to UNDERSTAND the concepts related to network and system level security, basics of computers and networking including Internet Protocol, routing, Domain Name Service, and network devices.
310.2	Applying	Students will be able to EXTEND the knowledge of basic cryptography, security management, and network security techniques.
310.3	Applying	Students will be able to look at policies as a tool to effectively change an organization's culture towards a better secure environment.
310.4	Evaluating	Students will be able to EXAMINE security system at conceptual level.

Course Contents:

Unit 1: Overview of Networking Concepts

Basics of Communication Systems, Transmission Media, Topology and Types of Networks, TCP/IP Protocol Stacks, Wireless Networks, Internet.

Unit 2: Information Security Concepts

Information Security Overview, Background and Current Scenario, Types of Attacks, Goals for Security, E-commerce Security, Computer Forensics, steganography.

Unit 3: Security Threats and Vulnerabilities

Overview of Security threats, Weak / Strong Passwords and Password Cracking, Insecure Network connections, Malicious Code, Programming Bugs, Cyber crime and Cyber terrorism, Information Warfare and Surveillance.

Unit 4: Cryptography / Encryption

Introduction to Cryptography / Encryption, Digital Signatures, Public Key infrastructure, Applications of Cryptography, Tools and techniques of Cryptography, Security Management.

Unit 5: Security Management Practices

Overview of Security Management, Information Classification Process, Security Policy, Risk Management, Security Procedures and Guidelines, Business Continuity and Disaster Recovery, Ethics and Best Practice, Security Laws and International Standards, Security Audit.

Prescribed Books:

1. Behrouze A Forouzan, Cryptography and Network Security, McGraw Hill Publishers.
2. William Stalling, Cryptography and Network Security: Principles and practices, 4th ed, Prentice Hall Publishers

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COURSE CODE	MB311
COURSE TITLE	SUMMER INTERNSHIP PROJECT (SIP)
COURSE CREDITS	6

Course Description:

The Internship aims to offer students the opportunity to apply their knowledge in real-life environments through an industry placement for eight-weeks. It is expected that the skills students will gain from working with an organization will help them perform better on their jobs after graduation. In addition, the Internship greatly increases the chances for students to obtain full time employment after graduation

Course Objectives:

1. To expose the student to the environment and expectations of performance on the part of accountants in professional accounting practice, private/public companies or government entities.
2. To get hands-on experience about real world problems in a field relevant to their major of studies.
3. To acquire confidence for employment after graduation.
4. To acquire skills important for time management, discipline, selflearning, effective communication and so on.
5. To learn practically about team-work, collaboration, and leadership.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
311.1	Applying	Students will acquire the ability to make links across different areas of knowledge and to generate, DEVELOP and evaluate ideas and information so as to apply these skills to the project task.
311.2	Applying	Students will ACQUIRE the skills to communicate effectively and to present ideas clearly and coherently to specific audience in both the written and oral forms.
311.3	Evaluating	Students will be able to learn on their own, REFLECT on their learning and take appropriate actions to improve it.

Course Contents:

At the end of Second Semester each student shall undertake Summer Internship Project (SIP) for a minimum of 60 days / 08 weeks. SIP shall have 6 credits. It is mandatory for the student to seek advance written approval from the faculty guide and the Director of the Institute about the topic and organization before commencing the SIP.

The SIP may or may not have a Functional Focus, i.e. the student may take up a SIP in his/her intended area of specialization or in any other functional area of management. Ideally the SIP should exhibit a cross-functional orientation. SIP can be carried out in a Corporate Entity / NGO / SME / Government Undertaking / Cooperative Sector. SIP may be a research project – based on primary / secondary data or may be an operational assignment involving working by the student on a given task/assignment/project/ etc. in an organization / industry. It is expected that the SIP shall sensitize the students to the demands of the workplace.

Each student shall maintain SIP Progress Diary detailing the work carried out and the progress achieved on a daily basis. The student shall submit a written structured SIP report based on work done during this period. The student shall submit the SIP Progress Diary along with the SIP Report.

Students shall also seek a formal evaluation of their SIP from the company guide. The formal evaluation by the company guide shall comment on the nature and quantum of work undertaken by the student, the effectiveness and overall professionalism. The learning outcomes of the SIP and utility of the SIP to the host organization must be specifically highlighted in the formal evaluation by the company guide. The SIP evaluation sheet duly signed and stamped by the industry guide shall be included in the final SIP report.

The SIP report must reflect 60 days/08 weeks of work and justify the same. The SIP report should be well documented and supported by –

1. Institute's Certificate
2. Certificate by the Company
3. Formal feedback from the company guide
4. Executive Summary
5. Organization profile
6. Contents of the problem/task undertaken
7. Research methodology & data analysis (in case of research projects only)
8. Relevant activity charts, tables, graphs, diagrams, AV material, etc.
9. Learning of the student through the project
10. Contribution to the host organization
11. References in appropriate referencing styles. (APA, MLA, Harvard, Chicago Style etc.)

The completion of the SIP shall be certified by the respective Faculty Guide & approved by the Director of the Institute. The external organization (Corporate / NGO/ SME/ Government Entity/ Cooperative/ etc.) shall also certify the SIP work.

The students shall submit a spiral bound copy of the SIP report. The Institute shall conduct an internal viva-voce for evaluation of the SIP. The Panel shall comprise of two evaluators appointed by the Director of the Institute / Head of Department (for MBA departments in engineering colleges). Institutes are encouraged to involve senior alumni, industry experts, recruiters to conduct the internal viva-voce. The internal viva-voce panel shall provide a detailed assessment of the SIP report and suggest changes required, if any.

After the internal viva-voce, the student shall finalize the SIP report by incorporating all the suggestions and recommendations of the internal viva-voce panel. The internal guide shall then issue the Institute's Certificate to the student.

The student shall submit TWO hard copies and one soft copy (CD) of the project report Sem III. One hard copy of the SIP report is to be returned to the student by the Institute after the External Viva-Voce. In the interest of environmental considerations, students are encouraged to print their project reports on both faces of the paper. Only black bound copies are accepted.

There shall be an external viva-voce for the SIP. The external viva-voce shall be conducted after the theory exam of Semester III.

The Internal & the External viva-voce shall evaluate the SIP based on:

1. Adequacy of work undertaken by the student

2. Application of concepts learned in Sem I and II
3. Understanding of the organization and business environment
4. Analytical capabilities
5. Technical Writing & Documentation Skills
6. Outcome of the project – sense of purpose
7. Utility of the project to the organization
8. Variety and relevance of learning experience

Course Duration : 60 days/08 weeks

GBSRC MBA Syllabus



**GLOBAL BUSINESS SCHOOL AND RESEARCH CENTRE
DR. D. Y. PATIL VIDYAPEETH, PUNE**

(Accredited (3rd Cycle) by NAAC with a CGPA of 3.64 on four point scale at 'A++' grade)
(An ISO 9001:2015 & 14001 :2015 Certified University)

Name of the Programme : MBA

Name of Semester : SEMESTER IV

GBSRC MBA Syllabus

MARKETING MANAGEMENT SPECIALIZATION

COURSE CODE	MB401A
COURSE TITLE	CASES IN MANAGEMENT (MARKETING)
COURSE CREDITS	3

Course Description:

The course aims to get the students thinking and discussing issues pertaining to management drawing on what they already know. To increase awareness and knowledge of contemporary management issues and to allow students the opportunity to discuss and critically analyze source materials, in order to both enhance their understanding of the topics and to practice their analytical and debating skills.

Course Objectives:

1. To give students the confidence and experience of debating issues on the managerial command.
2. To give exposure exposure of real life Business situation and decision making with the best possible use of resources.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
401A.1	Remember	STATE Various concepts, theories, aspects of Marketing Management.
401A.2	Understand	EXPLAIN various Concepts, Models, Theories and Aspects of Marketing Management.
401A.3	Apply	IMPLEMENT Principles, Theories, Models of Marketing Management essential in solving Business Problems.
401A.4	Analyze	EXAMINE the given business problem in the case using Marketing Management Knowledge.
401A.5	Evaluate	CRITIQUE the given problem case with its pros and cons.
401A.6	Create	DEVELOP a case on real world business problem in Marketing Management.

Course Outline:

To facilitate student learning, a range of source materials will be used throughout the course to direct and stimulate discussion, course will be having five case studies from the contemporary topics of the specializations of management students which is to be discussed in the class room by respective subject faculty. Students are also encouraged to put forward their own ideas for sessions, and to contribute source materials where appropriate to increase engagement in, and relevance of, the course for students. Case analysis and presentations will be an integrate part of learning case studies.

CASES IN MANAGEMENT (MARKETING)

1. Five cases to be discussed analyzed and presented from the following topics
2. Following are the suggested topics however are not limited and open for contemporary topics.
 1. Segmentation & Target Marketing
 2. New product development
 3. Sales and Distribution
 4. Advertising & Brand promotion
 5. Marketing Consultancy Services
 6. Consumer Behavior
 7. Integrated Marketing Communication
 8. Services Marketing
 9. Marketing Research
 10. Marketing Plan, Marketing Mix

GBSRC MBA Syllabus

COURSE CODE	MB402A
COURSE TITLE	SERVICES MARKETING
COURSE CREDITS	3

Course Description:

This course examines the important and growing role services marketing plays in consumer and organizational target markets. Discussing current issues in services marketing and customer service strategies, this course focuses on effective customer relationship management; key service delivery elements; and service recovery strategies that lead to the successful implementation of a customer focus in service-based businesses.

Course Objectives:

1. To provide an in-depth appreciation and understanding of the unique challenges inherent in managing and delivering quality services. Participants will be introduced to and have the opportunity to work with tools and strategies that address these challenges.
2. To explain the unique challenges of services marketing, including the elements of product, price, place, promotion, processes, physical evidence, and people.
3. To describe how customer relationship marketing (CRM), including retention strategies, creates an environment that achieves excellence in customer service.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
402A.1	Remember	DEFINE the fundamental concepts and theories of Services Marketing.
402A.2	Understand	EXPLAIN the services marketing mix and factors affecting service design and delivery.
402A.3	Apply	MAKE USE of appropriate models of Service Quality to deliver better service.
402A.4	Analyze	EXAMINE paradigm in Services Marketing with respect to Customer expectations and zone of tolerance.
402A.5	Evaluate	CRITIQUE on global trends and trendsetters of service sector along with challenges and opportunities for service providers in global market.
402A.6	Create	DESIGN Services Marketing Strategies for Service Sectors.

Course Contents:

Unit 1: Introduction

Difference between product and services marketing; Characteristics of services; Classification of services; Paradigms in services marketing. Service marketing system: Service quality; Understanding customer expectations and zone of tolerance; Segmentation and zone of tolerance; Targeting and positioning of service. Role of Services in Economy.

Unit 2: Services Marketing Mix:

Augmented marketing mix; Developing the service product/intangible product; Service product planning; Service pricing strategy; Services promotions; Services distributions. Physical evidence:

Role of communication in service marketing; People and internal communication; Process of operations and delivery of services; Role of technology in services marketing.

Unit 3: Service Quality

Quality Issues and Quality Models (Gaps model, SERVQUAL); Demand-supply Management. Services failure, service recovery, Customer retention, Customer Relationship management, designing of service strategy.

Unit 4: Marketing of Services in Practice - Tourism Services Marketing, Marketing of Transportation & Logistics Management, Marketing of Financial Services, Marketing of Communication Services, Media & Advertising Service Marketing, Marketing of Healthcare Services, Marketing of Consultancy Services, Marketing of Retail Services, Educational Services, Marketing of Public Services.

Unit 5: Services in global perspective: International marketing of services; recent trends; Principal driving force in global marketing of services; Key decisions in global marketing; Services strategy and organizing for global marketing.

Prescribed Books:

1. Services Marketing - Zeithaml, Bitner, Gremler and Pandit, TMGH, 4th ed.
2. Services Marketing - Christopher Lovelock.
3. Services Marketing - Rampal and Gupta.
4. Essence of Services Marketing – Ardian Payne.

GBS RC MBA Syllabus

COURSE CODE	MB403A
COURSE TITLE	B2B MARKETING
COURSE CREDITS	3

Course Description:

Business-to-business (B2B) refers to a situation where one business makes a commercial transaction with another. This Course typically covers how a business is sourcing materials for their production process.

Course Objectives:

1. To study industrial or business to business marketing concepts and strategy involved in the planning, conception, promotion, distribution and sale of products from one business firm or organization to another.
2. To understand the ideas and reasoning that underlie these concepts, to be measured by performance on examinations.
3. To demonstrate preparation for entry into a career in industrial marketing, to be measured by overall performance in meeting the courses requirements.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
403A.1	Remember	DESCRIBE various theories, concepts and models related to B2B Marketing.
403A.2	Understand	EXPLAIN channel structure, pricing and promotion concepts, theories and models of industrial products.
403A.3	Apply	MAKE USE of tools and methods to identify the influencing factors of organizational buying.
403A.4	Analyze	RELATE the factors influencing the pricing decision with appropriate type of pricing for industrial products.
403A.5	Evaluate	APPRAISE industrial buying process for various industrial products.
403A.6	Create	FORMULATE a promotional plan of B2B marketing for industrial products.

Course Contents:

Unit 1: Understanding Industrial Market:

Industrial (B2B) Vs. Consumer Marketing, The Nature of Industrial Demand and types Industrial Customer, Classification of Industrial products, Market Segmentation Bases: Macro Variables - Industry Characteristics, Company Size, Customer Location, End User Markets, product Applications. Micro Variables: Customer Interaction needs, Organizational Capabilities, Purchasing Policies, Purchasing Criteria, and Personal Characteristics.

Unit 2: Organizational Buying Behaviour (OBB):

Purchasing Objectives, Organizational Buying Decision Process; Buying Situations, Buying Roles; The Buy Grid Framework, Environmental and organizational Influences, Models of OBB, Buyer Seller Relationship

Unit 3: B2B Distribution Channels and Logistics :

Types of Industrial Middlemen, Channel Design, Channel Structure - Geographical, size, operating characteristics, Manufacturers' and Sales agents – Brokers, Formulating Distribution Strategies, Channel Logistics, Use of digital platforms by B to B organizations, Virtual Marts

Unit 4: Pricing for Industrial Products:

Factors influencing pricing decision– Pricing Objectives, Breakeven analysis, Return on Investment, Learning Curve effects analysis, Cost and profit analysis, Pricing Policies: Discount pricing – trade discounts – Quantity discounts- Cash discounts, Geographic pricing – factory pricing – freight allowance pricing, Terms of Sale – Outright purchase – Hire-purchase – Leasing, Auctions-Documentation – bids – order placement – follow up – receipt and inspection

Unit 5: Promotion for Industrial products:

Development and Management of Sales Force, Supporting salesman – Motivating distributors – Stimulating primary demand – Sales appeal, Key Account Management - ABC Analysis of Industrial Customers, Publicity and sponsorships, Trade shows – Exhibits, promotional letters – Promotional novelties Use of Social Media, Use of technology in branding

Prescribed Books:

1. Industrial Marketing – Hill, Alexander, Cross.
2. Industrial Marketing –Hawaldar.

Additional Reading :

1. Industrial Marketing – Analysis, Planning and Control – Reeder, Brierty, Reeder.
2. Industrial Marketing – P. K.Ghosh.

COURSE CODE	MB404A
COURSE TITLE	RETAIL MANAGEMENT
COURSE CREDITS	3

Course Description:

This course examines the important and growing role retail marketing plays in consumer and organizational target markets. The emerging issues in retail marketing and customer service strategies are incorporated in the course.

Course Objectives:

1. To describe how technology (e.g. customer databases, integrated systems, and buying and sales forecasting systems) is used to support retail businesses.
2. To evaluate the effectiveness of merchandising decisions in the retail industry.
3. To explain the factors relating to visual merchandising, such as store layouts and presentation.
4. To describe the flow of goods and services in a retail environment (e.g. inventory control, supply chain, and risk management).

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
404A.1	Remember	DEFINE concepts and theories of retailing.
404A.2	Understand	DESCRIBE the various retail management functions, E-Tailing, Merchandise and Store Management, Customer Service and Supply Chain Management of retail management.
404A.3	Apply	IMPLEMENT retail management concepts to solve real life retailing problems.
404A.4	Analyze	COMPARE and CONTRAST Retailing V/s E-Tailing.
404A.5	Evaluate	CRITIQUE Gap Model to identify standard and actual delivery with respect to supply chain management.
404A.6	Create	DESIGN an assortment plan for Merchandise and Store Management.

Course Contents:

Unit 1: Introduction to the world of retailing

Meaning of retailing, Social and Economic significance of retailing, Opportunities in retailing, Types of retailers, Theory of retailing: Wheel of retailing, the Accordion, Emerging trends in retailing, The retail scenario in India, Multichannel Retailing, customer buying behaviour.

Unit 2: Retailing Strategy

Retail Strategy: Definition, Building a sustainable competitive advantage, Growth strategies, Retail locations, Retail site location, Retail organization and HRM, Gaining competitive advantage through CRM, Retail communication mix : Methods of communicating with customers.

Unit 3: E-Tailing

Introduction, Features of e-tailing, Advantages and Disadvantages, Scope of e-tailing, Growth

drivers to e-tailing, E-Tailing strategies, Retailing V/s E-Tailing.

Unit 4: Merchandise and Store Management

Merchandise management process, Sales forecasting, developing an assortment plan, store management: Responsibilities, store layout and design, space management, visual merchandising.

Unit 5: Customer Service and Supply Chain Management

Customer service strategies, Gap Model: standard and delivery, service recovery, Supply Chain Management and information system.

Prescribed Books:

1. Retailing Management – SwapnaPradhan.
2. Retail Management – GibsonVedamani.
3. Physical Distribution and Logistics Management – Dr. SubhashBhave.
4. Channel Management and Retail Management – MeenalDhotre.

GBSRC MBA Syllabus

COURSE CODE	MB405A
COURSE TITLE	INTERNATIONAL MARKETING
COURSE CREDITS	3

Course Description:

International marketing is adopted by majority of brands now so it becomes essential for managers to understand it. International marketing is the export, franchising, joint venture or full direct entry of a marketing organization into another country. This can be achieved by exporting a company's product into another location, entry through a joint venture with another firm in the target country, or foreign direct investment into the target country.

Course Objectives:

1. To understand the fundamentals of International Marketing.
2. To bring countries closer for trading purpose and to encourage large scale free trade among the countries of the world.
3. To bring integration of economies of different countries and thereby to facilitate the process of globalization of trade.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
405A.1	Remember	STATE the theories, concepts and important terms of International Marketing.
405A.2	Understand	DISCUSS Internal and external environment of International Marketing.
405A.3	Apply	INTERPRET international product management with respect to product and culture in international markets.
405A.4	Analyze	EXAMINE the challenges encountered in managing an efficient international distribution strategy.
405A.5	Evaluate	APPRAISE strategies for entering global market arena by Indian firms.
405A.6	Create	DESIGN global marketing strategic plan for firms planning to enter international markets.

Course Outline:

Unit 1: International Marketing

Meaning, Definition, Scope and Significance of International Marketing, The importance of international marketing, Differences between international and domestic marketing International environment, International Social & culture Environment, the political legal environment and regulatory environment of international marketing. Globalization, Internationalization, International Marketing Issues.

Unit 2: International Market Entry Strategies

Indirect Exporting, Domestic Purchasing, Direct Exporting, Foreign Manufacturing Strategies without Direct Investment, Foreign Manufacturing Strategies with Direct Investment. Entry Strategies of Indian Firms.

Unit 3:International product management

International product positioning, Product saturation Levels in global Market, International product life cycle, Geographic Expansion–Strategic Alternatives. New products in Intentional Marketing, Product and culture, brands in International Market.

Unit 4:International Marketing Channels

Channels –Distribution Structures, Distribution Patterns, Factors effecting Choice of Channels, the Challenges in Managing an international Distribution Strategy Selecting Foreign Country Market intermediaries. The management of physical distribution of goods, Advertising and Branding, Grey Market goods.

Unit 5:Developing Global Marketing Strategy

Benefits of global marketing, planning for global markets, the planning process, Obtaining export credit insurance, Golden rules for successful Exporting, Export Marketing : Introduction to Export Marketing, Export Policy Decisions of a firm, ECGC – Insurance policies and Financial Guarantees, Rules for successful exporting, EXIM Bank.

Prescribed Books:

1. International Marketing Analysis and Strategy, Sak Onkvisit, John J. Shaw, PHI.
2. International Marketing, Michael R.Czinkota, Likka A Ronkainen, Cengage.
3. Global marketing Management, Keegan, Green, 4/e, Pearson.

Suggested Readings:

1. International Financial Management by Thummulur;Siddiah.
2. International Financial Management – by Madhu Vij --- excelbooks.
3. International Finance and Trade – ICAI publication –2volumes.

COURSE CODE	MB406A
COURSE TITLE	STRATEGIC MARKETING
COURSE CREDITS	3

Course Description:

This course is designed to provide exposure to students pertaining nature and scope of strategy in marketing department. The purpose of the course is to understand and implement various strategic tools and techniques which can be useful in marketing.

Course Objectives:

1. To create awareness about strategic marketing tools & techniques among students.
2. To make students aware about implementation of strategy in real marketing scenario.
3. To make the students aware about strategy evaluation with real life cases.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
406A.1	Remember	DEFINE the concepts, theories and models of strategic marketing.
406A.2	Understand	DISCUSS changes in the strategic marketing environment.
406A.3	Apply	DEMONSTRATE the skill of analyzing the marketing situation and design the strategy accordingly.
406A.4	Analyze	MAKE USE of strategic marketing concepts with respect to consumer behavioral analysis.
406A.5	Evaluate	CRITIQUE marketing control process with the use of marketing audits and evaluation.
406A.6	Create	DESIGN strategic marketing plan for different sectors like FMCG , industrial & services.

Course Outline:

Unit 1: Basics of Strategy

Strategy definition - concept of strategic marketing management & its objectives - vision, mission, objectives and goals of business and its relationship with strategic marketing management – impact of 4P's on strategic marketing.

Unit 2: Environment Analysis

Concept of environment – components of environment – environment scanning & appraisal – organizational appraisal – strategic advantage analysis - SWOT Analysis Strategic marketing overview - Global meltdown and India evolving - changing rules of marketing - competitive advantage - Corporate strategy vs. Marketing strategy.

Unit 3: Marketing Strategy Formulation

Industry analysis – competitor analysis - GAP Analysis – Porter's 5 forces Model of competition,

BCG Matrix, GE 9 Cell Model, McKinsey's 7S framework – SPACE matrix – distinctive competitiveness – strategic choice – factors affecting strategic choice – cost, differentiation, leadership, value chain, bench marking.

New product development strategies - planned or unplanned strategy withdrawals - contingency/alternative strategic planning - brand Strategies in FMCG markets - rural & export marketing strategies - marketing strategies for IT and ITES industries.

Unit 4: Strategic Marketing Implementation

Marketing strategy and customer analysis – consumer behavior – customer adoption process – classification and grouping of buyers – market segmentation – customer motivation – positioning – developing and testing brands – industry trends and global competition – technological revolution and strategic marketing – internet and strategic marketing, Implementation of marketing strategies in different business sectors – FMCG, Industrial & Services - constraints in marketing strategy implementation.

Unit 5: Marketing Strategy Evaluation

Marketing control process – types of marketing control - marketing audits & its scope – measurement of marketing performance – importance of evaluation and feedback.

Prescribed Books:

1. Strategic Management: Text and Cases – S. Shajahan, Viva Books.
2. Strategic Marketing Management: Text & Cases – U.C. Mathur, Macmillan Publication.
3. Marketing Strategy, TMH Ed. - Boyd Walker, Mullins Larrech.

Suggested Readings:

1. Business Policy & Strategic Management – Azar Kazmi.
2. Strategic Marketing – A. Nag, Macmillan Publication.

COURSE CODE	MB407A
COURSE TITLE	MARKETING OF FINANCIAL SERVICES
COURSE CREDITS	3

Course Description:

This course is to introduce students to the marketing of financial services. All financial institutions, including consumer banks and corporate finance services, practice some form of marketing. Some firms market themselves better than others, as evidenced in the competitive value of their brands. This course will demonstrate to students the benefits of using an analytical approach to marketing in the financial services industry, and will show students how to undertake that analysis

Course Objectives:

1. To understand the fundamentals of marketing for financial services
2. To evaluate how marketing contributes to success in modern financial institutions
3. To know the strategies of marketing the financial products and services to target markets.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
407A.1	Remember	DEFINE the concepts and theories of marketing of financial services.
407A.2	Understand	DESCRIBE the role of 7P's of marketing for financial services.
407A.3	Apply	MAKE USE of the concepts and theories of advertising channels in designing marketing programmes for financial services.
407A.4	Analyze	COMPARE & CONTRAST transactional vs relationship marketing.
407A.5	Evaluate	APPRAISE the Lifetime Value of a Customer for an organization into financial service.
407A.6	Create	DESIGN marketing strategies for banks and financial institutions.

Course Outline:

Unit 1: Marketing of Financial Services

Definition of marketing; four pillars of marketing (customer orientation, profit, total company effort, social responsibility); Introduction to Service Industry, Financial Services Industry overview selling versus marketing Segmentation – Concept, basis, strategies; Target market selection and market positioning strategies Pricing Strategy - Role of price in marketing of financial services; pricing strategies; pricing decisions.

Unit 2: Marketing Mix for Financial Services

7 Ps - Product, People, Process, Promotion, Price, Place and Physical evidence (Case study discussions on Marketing mix for banks, insurance companies, mutual funds, stock broking firms).

Unit 3: Advertising and Communication

The Roles of Advertising- Advertising Channels- Promotions- Publicity- The Contribution of Advertising and Communications to Marketing Programmes of Financial Institutions. Branch Location and Distribution: · Introduction- Means of Distributing Financial Services- Locating Bank Branches- New Technology and Branching- Creating the Branch Image.

Unit 4: Relationship Marketing

Introduction to Relationship Marketing, Transactional Marketing Vs Relationship Marketing, Reasons for Relationship Marketing, Characteristics of Relationship Marketing- 5 E's, Three Types of Customers, Aims of Relationship Marketing, Lifetime Value of a Customer (LTV), Retention Strategies.

Unit 5: Marketing Strategies of Financial Institutions

Introduction- Corporate Planning- Formulating a Marketing Strategies for Banks and Financial Institutions, Implementing Marketing Strategy. Marketing Strategy of New Products. Marketing Research in Financial Institutions, The Role and Functions of Marketing Research in Financial Institutions, Applications of Marketing Research in Financial Institutions.

Prescribed Books:

1. Andrew, Kenneth. Bank Marketing Handbook.
2. Arthur, Mechian. Bank Marketing Management.

Suggested Readings:

<https://lavdimhalimi.files.wordpress.com/2019/10/the-financial-services-marketing-handbook.pdf>

GBSRC MBA Syllabus

AGRI BUSINESS MANAGEMENT SPECIALIZATION

COURSE CODE	MB401B
COURSE TITLE	CASES IN MANAGEMENT(AGRIBUSINESS)
COURSE CREDITS	3

Course Description:

The course aims to get the students thinking and discussing issues pertaining to management drawing on what they already know. To increase awareness and knowledge of contemporary management issues and to allow students the opportunity to discuss and critically analyse source materials, in order to both enhance their understanding of the topics and to practice their analytical and debating skills.

Course Objectives:

1. To give students the confidence and experience of debating issues on the managerial command.
2. To give exposure exposure of real life Business situation and decision making with the best possible use of resources.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
401B.1	Remember	DESCRIBE the major concepts, terms, models, frameworks and research findings in the field of Agribusiness
401B.2	Understand	SUMMARIZE the impact of current trends in Agribusiness.
401B.3	Apply	MAKE USE OF the Theories, Models, Principles and Frameworks of Agriculture in analysing the cases of agribusiness
401B.4	Analyze	ATTRIBUTE the Agribusiness Case with reference to Theories, Models, frameworks of Agriculture
401B.5	Evaluate	TEST a given Case of Agribusiness with reference to the Current Trends, Best Practices in Agribusiness
401B.6	Create	DEVELOP a Case on any one of the given Agribusiness concepts or problem or scenario

Course Outline:

To facilitate student learning, a range of source materials will be used throughout the course to direct and stimulate discussion, course will be having five case studies from the contemporary topics of the specializations of management students which is to be discussed in the class room by respective subject faculty. Students are also encouraged to put forward their own ideas for sessions, and to contribute source materials where appropriate to increase engagement in, and relevance of, the course for students. Case analysis and presentations will be an integrate part of learning case studies.

CASES IN MANAGEMENT (AGRIBUSINESS)

1. Five cases to be discussed analyzed and presented from the following topics
2. Following are the suggested topics however are not limited and open for contemporary topics.
 1. Doubling the Farmer's Income
 2. Woman Entrepreneur
 3. Impact of Rural entrepreneurship on migration
 4. Evolution of organic farming
 5. ICTs in Indian agriculture
 6. Innovation generating revenue for rural women
 7. Farming for ecosystem services
 8. Building a Climate-Resilient Value Chain
 9. Empowering Procurement Professionals toward Sustainable Procurement
 10. A Sustainable Supply Chain for Agribusiness

GBSRC MBA Syllabus

COURSE CODE	MB402B
COURSE TITLE	AGRICULTURAL ECONOMICS
COURSE CREDITS	3

Course Description:

Meaning of Agricultural Economics, Importance of Agriculture in Economy, various economic theories. It will focus on practical exposure of principles and theories in agri business management. This course will deal with the decision making in agri business, food processing w.r.t. economics.

Course Objectives:

1. To explain different concepts, theories, principles of agricultural economics.
2. To know about different cost concepts, cost sheet.
3. To orient students about cost calculations in agricultural activities including farming and agro industries.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
402B.1	Remember	IDENTIFY the nature, scope and economies of scale in Agricultural Economics
402B.2	Understand	DESCRIBE the Short-, Medium- and Long-Term economic growth, cost concepts in agril economics
402B.3	Apply	IMPLEMENT Law of Diminishing Returns
402B.4	Analyze	EXAMINE Economic policies related to Seeds, Fertilizers, Pesticides, Irrigation, Credit Policy, Food Policy, Laws
402B.5	Evaluate	CRITIQUE Agribusiness Management Economic policies, project planning and cost associated with Agricultural Project.
402B.6	Create	DEVELOP Financial Economic plan for securities, stocks, bonds and derivatives for Agricultural products.

Course Outline:

Unit 1: Nature and Importance of Agricultural Economics

Nature, Scope, Importance of agricultural economics, production process, economies of scale in production, agricultural production function, Micro and Macro Economics.

Unit 2: Economic growth and agricultural development

Short, Medium and Long Term growth, Development of Economics, Economic progress of developing countries, Economics Institutions and their role, functions etc.

Unit 3: Agricultural Cost Concepts

Different costs associated with economics, cost curves, meaning of cost sheet, cost sheet preparation and presentation, Law of Demand and Supply, Law of Diminishing Returns / Law of Equi Marginal Utility, Demand and Supply function.

Unit 4: Agri Business Management Economics

Economic Principles Applied to Financial Management of the Farm, Economic policies related to Seeds, Fertilizers, Pesticides, Irrigation, Credit Policy, Food Policy, Laws related to WTO / Farmers Rights Act / Farmer Bill, Agri Poverty Measurement and Suggestions, Project Planning and Costs associated with agricultural project.

Unit 5: Financial Economics

Basic difference between finance and economics, Introduction to share market, Concept of securities, stocks, bonds, Financial institutions in India, Derivatives analysis, regulations of financial markets.

Prescribed Books:

1. Bhalla, G. S. and Singh G., 2001, Indian Agriculture: Four Decades of Development, Sage Publications.
2. Dhondyal, S.P. "Farm Management -An Economic Analyst & quot; Friends Publications. Meerut.
3. Ghatak, S and K Ingersent (1984) Agriculture and Economic Development, Select Book Service Syndicate, New Delhi.
4. Ramaswami, Bharat ; Shamika Ravi And S.D. Chopra (2004), Risk Management, State of the Indian Farmer- A Millennium Study, Volume 22, Academic Foundation, New Delhi.

Suggested Readings:

1. Chandra, P. (2000), Financial Management, Tata McGraw Hill.
2. Chadha G. K. (2003), WTO and Indian Economy. Deep and Deep Publications.

COURSE CODE	MB403B
COURSE TITLE	FRAMEWORK OF ICT IN AGRI BUSINESS MANAGEMENT
COURSE CREDITS	3

Course Description:

Meaning of ICT in Agri Extension and Agri Business Management, Use of IoT in Agri Business Management, Different websites, Use of AI in agriculture.

Course Objectives:

1. To acquaint the students with scope of ICT in agriculture, networking and communication media.
2. To give knowledge about updated IT tools in Indian Agricultural System

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
403B.1	Remember	DEFINE the concepts and scope of ICT in Agribusiness Management.
403B.2	Understand	SUMMARIZE Telephone/Mobile technologies in Agribusiness Management.
403B.3	Apply	IMPLEMENT practices of ICT for Agricultural Extension.
403B.4	Analyze	RELATE the use of ICT in setting of Village Knowledge Centre (VKC/CIC).
403B.5	Evaluate	CRITIQUE Blog extension practices, voice enabled extension services, SWOT analysis of ICT based agriculture projects.
403B.6	Create	DESIGN Village Knowledge Centre.

Course Outline:

Unit 1: Introduction & scope of ICT in Agriculture

Need for ICT in Agricultural Extension. National Policies on ICT in Agricultural Extension. Role of communications in ICT: Concept, elements & their characteristics. Message: meaning, dimensions of a message characteristics of a good message, message treatment and effectiveness, distortion of message. Methods of communication: meaning and function. Forms of communication. Role of Mass Media in dissemination of farm technology. Modern communication media: electronic video, tele text, teleconference, computer assisted instruction.

Unit 2: Telephone/Mobile Technology

Farmer Call Centre, SMS Broadcast Service, m-krisi. ICT initiatives of NGOs and Private Companies. ICT initiatives by ICAR and SAUs, Value Added Services, Fisher Friend Project, SMS Services to farmers by Department of Agriculture.

Unit 3: Practices of ICT for Agricultural Extension

aAQUA, Digital Green, e-Agrik (e- Agriculture), e- Sagu (e-cultivation), KISSAN (Karshaka

Information Systems Service and Networking), Solutions through Information, VASAT-Virtual Academy for the Semi-Arid Tropics, Touch Screen Kiosk, e-Extension (e-Soil Health Card Program). Village.

Unit 4: Village Knowledge Centre (VRC/VRC/CIC)

Introduction, concept, process for setting VRC. Warana Wired Village Project, Web Portals: AGRISNET, DACNET, InDG, DEAL, i-KISAN, e- Krishi, ASHA, IFFCO- Agri-Portal, Agriwatch Portal, i-Shakti. ICTs for market information and Agri-Business: AGMARKNET, e-KRISHI VIPNAN, ICT-e-CHOPAL, EID Garry-Indiagriline.

Unit 5: Cloud Based Extension Approaches

Blog extension practices, voice enabled extension services, SWOT analysis of ICT based agriculture projects.

Prescribed Books:

1. G.L. Ray, 2006. Extension communication and management. Kalyani Publ.
2. A.S. Sandhu, 2004. Text book on Agricultural communication process and methods. Oxford &TBH.
3. R Saravanan, C Kathiresan & T Indra Devi, 2011. Information & communication technology for agriculture and rural development. New India Publ. Agency.
4. R Saravanan 2010. ICTs for agricultural extension, New India Publ. Agency.

Suggested Readings:

1. B Jirli, Deepak De & GCKendadamth 2005. Information and communication technology (ICT) and sustainable development, Ganga Kaveri Publ. House, Varanasi.
2. Shaik N Meera, 2008. ICTs in agricultural extension tactical to practical. Ganga Kaveri Publishing House, Varanasi.

COURSE CODE	MB404B
COURSE TITLE	RURAL CREDIT AND URBAN FINANCE FOR AGRICULTURE
COURSE CREDITS	3

Course Description:

There is an ever increasing need to invest in agriculture due to drastic rise in global population and changing dietary preference of the growing middle class in emerging market toward higher value agriculture product. In addition, climate risk increase the need for investments to make the agriculture resilient to such risk. Agriculture rural finance are strategically important for eradicating extreme poverty and boosting shared prosperity.

Course Objectives:

1. To appraise the students about details of activities those come under agriculture finance in general and procedure of rural credit to farmers/entrepreneurs/infrastructure development.
2. To explain the role of RBI, NABARD, Commercial Banks, Nationalized Banks, Cooperative Banks and Regional rural Banks in Rural Development in general and Agriculture in particular
3. To understand the classification of priority sector loans into agriculture, small scale industries and other priority sector loans and national targets there-under.
4. To explain the concept of technical feasibility, economic viability and bankability of agriculture projects as also balance sheet study etc.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
404B.1	Remember	STATE various concepts, activities, eligibility proponents related to agricultural finance.
404B.2	Understand	DESCRIBE various agri finance institutions with reference to their functions, boundaries and capacity in terms of rural credit and urban finance.
404B.3	Apply	USE of agricultural activities for getting credit- crop production, land development, minor irrigation, farm mechanization and equipment.
404B.4	Analyze	COMPARE the eligibility of getting finance from the various institutions under Agricultural activities and other Agri-related activities .
404B.5	Evaluate	JUSTIFY the working principles and products of FPO/FPC for getting finance from NGO and Private institutions
404B.6	Create	DESIGN a proposal forgetting Rural Credit Finance for Agricultural activities or non-agricultural activities with appropriate use of Banking norms.

Course Contents:

Unit 1: Agriculture Finance

Definition and concept of agri finance, various activities under agri finance, Eligibility of proponents, Kisan Credit Card Scheme, Role of Banking in Rural Development with respect to

District Credit Plans(DCP), Branch Expansion procedure, Banks Nationalization, Lead Bank Scheme, Priority Sector Lending, poverty alleviation and employment generation.

Unit 2: Agri Finance Institutions

RBI, NABARD, Commercial Banks, Nationalized Banks, Cooperative Banks and Regional rural Banks and State Finance Corporations, Agriculture Loans- Assessment of credit needs, short term loans, medium term loans, long term loans.

Unit 3: Agriculture Activities

Eligibility for credit-crop production, land development, minor irrigation, farm mechanization and implements/equipment, dairy and poultry development, plantation and horticulture crops Pisciculture development, Financing Hi-tech Agricultural projects.

Unit 4: Other Agri related activities

Finance against storage receipts, Bio-Gas plants, and construction of godowns, cold storages Market yards, Gold loan scheme, Financing SF/M/F for acquiring shares, Microfinance to self Help groups, Financial Inclusion, Documents required for microfinance.

Unit 5: Banking Norms

Proposal Forms, Margin/security norms, Interest rates, Relief measures to the victims in areas affected by natural calamities, Security documents, Loan Repayment, over dues, Non-Performing Assets, etc., NABARD Refinance, Problems in Rural Credit System, Documents required for banking.

Prescribed Books :

1. Rural Development in India by Vasant Desai (PP313-401).
2. Bank Financing and Agriculture Development by M. H. Ansari (PP57-189).
3. Agricultural Risk Management- Challenges and Strategies by BVS Prasad and Suchitra Mohanty (PP 69-74).
4. Role of Agriculture in Indian Economy by N.K. Sharma and Sarita Sharma (pp55-60).
5. Agriculture and rural development by B. Mohanty (pp250-275).
6. Handbook for financing Agriculture by Bank of India.

COURSE CODE	MB405B
COURSE TITLE	PROCUREMENT AND WAREHOUSE MANAGEMENT
COURSE CREDITS	3

Course Description:

Among various pain areas of agriculture in India are insufficient infrastructure and knowhow of warehousing, logistics and related aspects. It also becomes opportunity for next growth of agriculture industry in India. This course gives necessary insight into the details of procurement practices, warehousing processes and technology associated with it and the details of various transportation options available.

Course Objectives:

1. To understand the concepts and importance of agricultural procurement and warehousing.
2. Co correlate the concept of logistics as a bridge between procurement and warehousing.
3. To apply modern day technological advancements in the field of logistics and warehousing.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
405B.1	Remember	DEFINE the concepts and importance of agricultural procurement and warehousing
405B.2	Understand	DESCRIBE the methodology and basic principles of procurement and warehouse management
405B.3	Apply	DEMONSTRATE modern day technological advancements in the field of logistics and warehousing
405B.4	Analyze	COMPARE various models of transportation for Inland and Overseas.
405B.5	Evaluate	CRITIQUE interventions and Role of Government in Procurement and Warehouse Management.
405B.6	Create	DESIGN a proper warehouse at farm level.

Course Contents:

Unit 1: Introduction, Overview, Materials and Parameters

Stages and varying storage needs, Quantity, Properties, Availability, Consumption, Safety and PHM.

Unit 2: Availability, Consumption, Storage Needs and Finance Related to Procurement

Regional crops and use around year, Preservation, Toensure availability when needed, Stocking for future needs- No crop season, Processing and packing, Finance availability and payments.

Unit 3: Warehousing

Pest control, Security and safety, Systems – LIFO, FIFO etc., Large Warehouses and auto handling – material handling equipment's, Arrangements/AMCs, SWC, FCI, CWC, APMC PvtWarehouses.

Unit 4: Inland and Overseas Transports

Modes of transportation, Large- solids, liquids (Mechanized), Locals and small.

Unit 5: Intervention and Role of Government

Agri inputs- Seeds, fertilizers, power, water etc., Implements, Modern tech trainings, Harvested crops, Food safety, Self-dependence /Sufficient, Imports and Exports and its Regulation.

Prescribed Books:

1. Warehouse Management: A Complete Guide to Improving Efficiency and Minimizing Costs in the Modern warehouse, 2nd edition.
2. World- Class warehousing and material handling 1st edition By Edward Frazelle.
3. Transportation: A Global Supply Chain Perspective, 8th Edition.
4. Facilities Planning 4th Edition.
5. Warehouse Management with SAP ERP (SAP WM).

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COURSE CODE	MB406B
COURSE TITLE	MANAGEMENT OF AGRI COOPERATIVES
COURSE CREDITS	3

Course Description:

Cooperative businesses exist in a wide variety of sectors within the Indian economy, and represent a distinctive model for organizing labor, capital, and knowledge to produce goods and services. Studying cooperatives aids understanding of all aspects of industrial structure and business organization, and challenges conventional thinking about what it means for an economic system to be “capitalist”. Fundamentally, cooperative firm represents a unique form of business ownership where “patrons”, rather than financiers, are business owners.

Course Objectives:

1. To apply the principles of management to agriculture cooperatives and to provide in depth understanding about agriculture products and their marketing through cooperatives at different levels.
2. To emphasize need for cooperative marketing for major agricultural products and to know difference between rural marketing and cooperative marketing.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom’s Level	Course Outcomes
406B.1	Remember	STATE various concepts, principles, factors, features of Agriculture Cooperative Management.
406B.2	Understand	DESCRIBE Cooperative Marketing Management with their advantages and disadvantages.
406B.3	Apply	USE of functional areas of Management to different types of cooperatives.
406B.4	Analyze	EXAMINE various issues in Cooperative Management.
406B.5	Evaluate	JUDGE the operating efficiencies of Cooperatives with reference to their structure.
406B.6	Create	DESIGN a proper framework or model for Managing Agri cooperatives.

Course Contents:

Unit 1: Introduction to agriculture cooperatives

Principles of cooperation, Cooperative management, Need and features of cooperative management, rural marketing scenario, Factors for success of cooperative management, Objectives and special goals of co-operative management.

Unit 2: Management in cooperative marketing

Integration of principles of management and cooperation, advantages and disadvantages of cooperatives, Management in direct marketing, private sector marketing, public sector marketing and cooperative sector marketing, Comparison of principles of cooperation and management practices.

Unit 3: Functional areas of cooperative marketing

Functional areas of management as applied to cooperatives, broad cooperative laws, institutional net working for cooperatives, Management of Co-op Banks, marketing cooperatives and consumer cooperatives, Management of industrial and processing cooperatives, Management of dairy Cooperatives, case studies in cooperatives, Role of agricultural cooperatives in rural marketing, Model Act-2003 for AgriCooperatives.

Unit 4: Issues in cooperative management

Managerial problems of Indian cooperatives, Democracy in cooperatives, Government schemes and Interventions.

Unit 5: Structure of cooperatives

Board of Directors, its role and functions, General Body-mouth piece of cooperative management, How to judge operating efficiency of cooperatives.

Prescribed Books :

1. Cooperative Management- Principles and Techniques by Dr. S. Nakkiran.
2. Rural marketing- Environment, problems and strategies by T. P. Gopalswamy.
3. The rural marketing book: by Pradeep Kashyap and S. Raut.
4. New prospects in rural and agriculture marketing by Ramkishen Y.
5. Cooperative movement in India (1904-2004) by Dr. V.V.Ghanekar.
6. Rural and Agricultural Marketing by Ramkishen Y.
7. Cooperative Agri-Business Management by A.N.Sarkar.
8. Indian Agriculture and Agri-Business Management by Dr. SmitaDiwase.
9. Journal of Agriculture Marketing, Directorate of Agri. Marketing, Ministry of Agriculture, Govt. of India, New Delhi.

COURSE CODE	MB407B
COURSE TITLE	AGRICULTURAL RISK MANAGEMENT AND CROP INSURANCE
COURSE CREDITS	3

Course Description:

Agriculture risk management course is of importance to Agri business students expecting to deal with business and professional lives in the future. Course focuses on what can be done at the farm, local area/community, and national levels to manage risks in agriculture. Basically, it purports to help students realize, understand, and master various state-of-the-art risk management and crop insurance and practices for their advancement in the future.

Course Objectives:

1. To provide an understanding and an appreciation of the principles and practices of risk management in order to enable production of the optimum strategy for the handling of risk in an organization.
2. To understand the various types of agriculture insurance available in the market.
3. To understand the nature of various on-farm tools relevant for farmers or communities to judge their suitability for a given area or farm situations.
4. To understand the latest technology in natural agricultural calamities management.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
407B.1	Remember	DESCRIBE the Concepts, importance, types of hazards as Agricultural Risk.
407B.2	Understand	EXPLAIN various concepts, parameters related to Agri-Risk Management.
407B.3	Apply	Effective USE of Crop Insurance to anticipate the Agricultural Risk factors.
407B.4	Analyze	EXAMINE the factors affecting risk, risk pattern and its consequences in Agriculture.
407B.5	Evaluate	SELECT appropriate Agribusiness plan for Agri-risk after understanding the factors.
407B.6	Create	INVESTIGATE the ways of anticipating agricultural risk.

Course Outline:

Unit 1: Introduction to Agricultural Risk

Meaning, Concept and Importance, Different types of hazards to agriculture and Agri operations – Wind, Frost, Mist, Unusual rainfall, drought, Typology for Agri Risks, Farmer's or Grower's views on Risk.

Unit 2: Agri- Risk Management

Parameters of Market Risk, Distribution Risk, Transport Risk, Accidental policies, Financial Risk, Plantation Risk, Procedures to deal with Risk – Insurance, Financial Packages, Remedial measure, Different acts to overcome Risk, RBI / NABARD policies for Risk.

Unit 3: Agricultural Risk Factor

Factors affecting Risk, Risk pattern and its consequences, Agri Business Plan for Agri- Risk after understanding the factors, Factors act on Horticulture, Floriculture, Sericulture, Apiculture etc. from Marketing and Transportation point of view.

Unit 4: Crop Insurance

Insurance sector at a glance, Need, Importance of CI, Documentation and procedure for crop insurance, Claim process, Government interventions in CI.

Unit 5: Sources of Crop Insurance

Private sector financial firms, Nationalized bank's schemes for CI, Government initiatives towards different crop insurance in detail – Sugarcane, Mango, Banana, Flowers, Vegetables, Rice etc., Selection of Insurance, Evaluation of Insurance agencies.

Prescribed Books:

1. Agricultural Risk Management, J. Deviprasad, B. Gangaiah, K. Suman Chandra, B S Publication.
2. Crop Insurance in India: An Analysis, Narendra K. Rustagi, BR Publishing Corporation.
3. Rural Insurance Potential and Challenges, Ramchandran, Insurance World.
4. Report on Comprehensive Crop Insurance Scheme 1985-95, Government of Karnataka. (1996). Directorate of Economics and Statistics and the State Agriculture Census Commissioner.

Suggested Readings:

1. The essentials of risk management, Michel Crouhy, Mc Graw Hill Publication.
2. Implementing Enterprise Risk Management: From Methods to Applications James Lam, Wiley Publication.

ELECTIVE II : FINANCIAL MANAGEMENT

COURSE CODE	MB401C
COURSE TITLE	CASES IN MANAGEMENT (FINANCE)
COURSE CREDITS	3

Course Description:

The course aims to get the students thinking and discussing issues pertaining to management drawing on what they already know. To increase awareness and knowledge of contemporary management issues and to allow students the opportunity to discuss and critically analyse source materials, in order to both enhance their understanding of the topics and to practice their analytical and debating skills.

Course Objectives:

1. To give students the confidence and experience of debating issues on the managerial command.
2. To give exposure exposure of real life Business situation and decision making with the best possible use of resources.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
401C.1	Remember	STATE various concepts, models and theories associated with Financial Management.
401C.2	Understand	DESCRIBE the major theories, concepts, terms, models, frameworks, and research findings in the field of Financial Management.
401C.3	Apply	INTERPRET Theories, Models, Principles and Frameworks of Financial Management in analyzing the cases of Financial Management.
401C.4	Analyze	COMPARE AND CONTRAST theories, models, frameworks of Financial Management and Appraise the Financial Management Cases.
401C.5	Evaluate	JUSTIFY the given case of Financial Management with reference to the Current Trends, Best Practices in Financial Management.
401C.6	Create	FORMULATE possible solutions to the given financial management case.

Course Outline:

To facilitate student learning, a range of source materials will be used throughout the course to direct and stimulate discussion, course will be having five case studies from the contemporary topics of the specializations of management students which is to be discussed in the class room by respective subject faculty. Students are also encouraged to put forward their own ideas for sessions,

and to contribute source materials where appropriate to increase engagement in, and relevance of, the course for students. Case analysis and presentations will be an integrate part of learning case studies.

CASES IN MANAGEMENT (FINANCE)

1. Five cases to be discussed analyzed and presented from the following topics.
2. Following are the suggested topics however are not limited and open for contemporary topics.
 1. Capital Budgeting
 2. Working Capital
 3. Evaluating Project Risk
 4. Ratio Analysis
 5. Cash flow Analysis
 6. Mutual Fund Analysis
 7. Share Market Analysis
 8. Bond Analysis and Valuation
 9. Financial Forecasting
 10. Valuation of Common Stock

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COURSE CODE	MB402C
COURSE TITLE	CORPORATE FINANCIAL RESTRUCTURING
COURSE CREDITS	3

Course Description:

The course aims to facilitate understanding of corporate merger and acquisition activity, restructurings and corporate governance. The focus will be on fundamental concepts of valuation and analytical tools of corporate finance related to restructuring. It combines applied theoretical approach with the case study method through detailed analysis of domestic and global restructuring cases.

Course Objectives:

1. To understand basic concepts related corporate restructuring, Mergers and Acquisitions, Valuation Aspects of Corporate Restructuring and Corporate Governance Aspects of Restructuring.
2. To understand and explain the motivations, decision processes, transaction execution, and valuation consequences of financial, business, and organizational restructuring by corporate units.
3. To evaluate the impact of corporate financial restructuring on all stakeholders.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
402C.1	Remember	IDENTIFY the need, scope and application of Internal and External Corporate Financial Restructuring.
402C.2	Understand	CATEGORISE various Corporate Restructuring strategies in corporate finance.
402C.3	Apply	EXECUTE restructuring in the areas of mergers, acquisitions and takeover.
402C.4	Analyze	EXAMINE the valuation aspects of an organization in corporate restructuring.
402C.5	Evaluate	MONITOR various business valuation methodologies and their applications.
402C.6	Create	INVESTIGATE various approaches for valuation of business.

Course Content:

Unit 1: Basic Concepts

Meaning of Corporate Restructuring, Need, Scope, Concept of Internal and External Restructuring and motives, applications of corporate restructuring.

Unit 2: Overview of Corporate Finance and Corporate Restructuring

Financial Restructuring and Divestiture, Funding Options for M and A, Strategic Alliances and Joint Ventures, Going Private and Leveraged Buyouts, Corporate Reorganization Strategies- Spin-

Offs, Equity Carve- Outs, Target Stock and Divestures, Financial perspective in restructuring, Reorganization strategies, Financial Distress and Bankruptcy, Liquidation, Net Operating Losses, Sources of Funding and Problem of changing Capital Structure, Strategic and Financial Sponsors, Pros and Cons of different Sponsors, Capital Cash Flows Vs. Equity Cash Flows.

Unit 3: Dimensions of Corporate Restructuring

Mergers and acquisitions -concept, types and process, Accounting for Mergers and Demergers, Regulatory framework of mergers and acquisitions, Due diligence for M and A, Cross-Border Mergers and Acquisitions, Take-over and Defense Tactics, Structural Defenses vs. Non Structural Defenses, Contribution Analysis, Duties of Board of Directors.

Unit 4: Valuation Aspects of Corporate Restructuring

Different Concept of Value- Book Value, Market Value, Intrinsic Value, Liquidation Value, Replacement Value, Salvage Value and Fair Value, Approaches to valuation of business- Asset based, Earning based, Market value based, Fair value based, EVA and MVA.

Unit 5: Corporate Governance Aspects of Restructuring

Domestic and International trends relating to governance practices pertaining to Corporate Restructuring, Indian Companies Act (Amended) 2013 norms relating to Corporate Restructuring, SEBI Regulations, Listing Agreement, Role of investors, creditors, non-executive directors in restructuring process, Disclosures norms on the part of Board of Directors.

Prescribed Books:

1. Financial Management, R. P. Rustagi, Galgotia Publishing.
2. Strategic Financial Management, Ravi M. Kishor, Taxmann.
3. Mergers, Acquisitions and Corporate Restructurings, Gaughan, P.A., John Wiley and Sons.

Suggested Reading:

1. Mergers and Acquisitions, B Rajesh Kumar, TATA McGraw Hill.
2. Takeovers, Restructuring, and Corporate Governance, James J. Fred Weston, Mark L. Mitchell, J. Harold, Pearson.
3. Corporate Finance, Ashwath Damodaran, Wiley India.

COURSE CODE	MB403C
COURSE TITLE	EQUITY RESEARCH
COURSE CREDITS	3

Course Description:

This course is about the analysis of financial information – particularly firms’ financial reports - for making decisions to invest in businesses. The primary focus is on equity (share) valuation. This course on Equity Research focuses on developing the necessary skills for the purpose of advising investors and financial institutions to make profitable investment decisions in the capital market.

Course Objectives:

1. To identify value created for shareholders.
2. To understand the role of financial statements in calculating equity values.
3. To be able to prepare equity research reports.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom’s Level	Course Outcomes
403C.1	Remember	STATE various concepts, principles and models related to Equity Research.
403C.2	Understand	EXPLAIN the roles and responsibilities of Research Analyst.
403C.3	Apply	IMPLEMENT Methods, Models and Frameworks for making financial projections.
403C.4	Analyze	COMPARE the Corporate annual Reports, Financial Statements, Audit reports and Write Equity Research Report.
403C.5	Evaluate	APPRAISE the corporate governance practices using Porter's five forces & MOAT model.
403C.6	Create	DEVELOP the skills required for equity analysis so as to formulate trading strategies.

Course Outline:

Unit 1: Equity Research: Introduction

Meaning, Goals of equity research, Elements of equity research, Process of equity research, Types of equity research, Classification of stocks, Market participants, Role of equity research in capital market and Different approaches to equity research.

Unit 2: Introduction to Research Analyst Profession

Role of research analyst, Responsibilities of research analyst, Basic principles of interaction with Clients/Companies, Qualities of Research Analyst.

Unit 3: Equity Analysis & Investing

Introduction, When to invest – stocks are high/low, Buy Low And Sell High proposition, Maximising Wealth through Investing in Growth Stocks, Defensive vs Cyclical Stocks, Growth

vs Value Stock, Blue-Chip Stocks and Reasons to Invest in Them.

Unit 4: Annual Report Analysis: Interpreting the Income Statement, Balance Sheet, Cash Flow Statement, Chairman's report, Auditor's report, Company ratios.

Unit 5: Porter's Five Forces & Moat Application

Introduction, Michael Porter's Five Force Model, Moats vs Floats, Margin of safety, Evaluating Management and Corporate Governance.

Prescribed Books:

1. Financial Statement Analysis and Security Valuation - Stephen Penman, McGraw-Hill.
2. Valuation: Measuring and Managing the Value of Companies- Copeland T, Koller T, Murrin J, Wiley.
3. Financial Reporting and Statement Analysis- A Strategic Perspective, Stickney P and Brown P, Dryden Press.

Suggested Reading:

1. The Analysis and Use of Financial Statements - White G, Sondhi A and Fried D, Wiley.
2. Best Practices for Equity Research Analysts - James Valentine, The McGraw Hill.

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COURSE CODE	MB404C
COURSE TITLE	FINANCIAL MODELLING
COURSE CREDITS	3

Course Description :

Presents the theory and practice of financial management, emphasizing computer-based modeling and forecasting. Uses spreadsheets and other software products to analyze the impacts of financial decisions related to financial statement analysis, cash budgeting, and cost of capital determination, capital budgeting, and capital structure choices. The course covers a variety of techniques, such as sensitivity and scenario analysis, optimization methods, Monte Carlo simulation, and regression analysis.

Course Objectives:

1. To provide students of an overview of various aspects building models in different areas of finance including investments, corporate finance, derivatives, valuation, project evaluation, deal structuring, portfolio management.
2. To acquaint the students with the model building skills required to build Powerful models in finance with the help of excel.
3. To provide students a platform to understand how risk can be built into the model to enhance decision making process.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
404C.1	Remember	IDENTIFY the need, scope and applications of financial modelling.
404C.2	Understand	CATEGORISE basic and advanced Microsoft excel formulae and tools to be used in financial modelling.
404C.3	Apply	APPLY pivot tables, V look up, H look up functions for data analysis.
404C.4	Analyze	INTEGRATE the applications of excel tools in financial modelling.
404C.5	Evaluate	CRITIQUE the available valuation techniques in financial modelling.
404C.6	Create	HYPOTHESISE the absolute value of Business using various discounted cash flow techniques.

Course Contents :

Unit 1: Basic Excel for Financial Modeling

Formatting of Excel Sheets, Use of Excel Formula Function, Data Filter and Sort, Charts and Graphs, Table formula and Scenario building, Lookups: V lookup Match and offset, Pivot tables.

Unit 2: Modeling and projecting the financial statements

Introduction to Financial Modeling, Understanding the links between the financial statements, Understanding circularity, Setting up and formatting the model, Selecting model drivers and assumptions.

Unit 3: Relative Valuation I (Trading Comparables)

Introduction to Trading Comparables, Filings and Sources, Methodology - Equity and Equity Linked Information, Balance Sheet Information, Balance Sheet – Adjustments, Market Cap – Adjustments, Income Statement Information, Income Statement – Normalization, Calculating Last Twelve Months in Income Statement, Understanding Multiples, Interpretation and Analysis of Trading Multiples.

Unit 4:Relative Valuation II (Transactions Comparable Analysis)

Transaction Comparables – Introduction Transaction Overview, Transaction Value, Types of Consideration, Target Financials – LTMs, Target Financials: Sources, Premium Analysis, Amendment of Deal Terms, MandA Deals Identification.

Unit 5: Absolute Valuation [Discounted Cash Flow (DCF)]

Discounted Cash Flow, Approaches to DCF Valuation, Discount Rate, Weighted Average Cost of Capital, Components of Weighted Average Cost of Capital, Free Cash Flows, Steps to DCF, Sensitivity Analysis, Approach to Calculate Terminal Value, Calculation of Enterprise Value, Calculation of Equity Value from Enterprise Value in a DCF Model, Revenue Drivers, Cost Drivers.

Prescribed Books:

1. Financial Modelling by Simon Benningo
2. Financial Analysis and Modelling by ChandanSengupta
3. Financial Modelling in Practice by Michael Rees
4. Financial Modelling and Valuation by Paul Pignataro
5. Financial Modeling for Business Owners and Entrepreneurs by Tom.Y Sawyer

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COURSE CODE	MB405C
COURSE TITLE	INSURANCE AND RISK MANAGEMENT
COURSE CREDITS	3

Course Description:

Risk management course is of importance to business students expecting to deal with business and professional lives in the future. This subject is designed to introduce and discuss various risk management concepts, tools, and techniques in global context. Using integrated approaches, the course will emphasize discussion on the design and implementation of risk management practices. Basically, it purports to help students realize, understand, and master various state-of-the-art risk management theories and practices for their advancement in the future.

Course Objectives:

1. To provide an understanding and an appreciation of the principles and practices of risk management in order to enable production of the optimum strategy for the handling of risk in an organisation.
2. To understand the various types of insurance available in the market.
3. To understand the various risk management tools available for hedging risk.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
405C.1	Remember	STATE various concepts, principles and legal frame-work associated with insurance and risk management.
405C.2	Understand	DESCRIBE the operation and management process of insurance entities along with economic implications.
405C.3	Apply	MAKE USE OF pricing, marketing, and distribution methods used in the insurance sector.
405C.4	Analyze	DIFFERENTIATE between various types of insurance products based on individual or organizational risk appetite.
405C.5	Evaluate	APPRAISE the role of regulatory authorities such as IRDAI in streamlining the functioning of Indian Insurance Sector.
405C.6	Create	ASSEMBLE a basket of insurance products custom made for a particular organization.

Course Contents:

Unit 1: Introduction to insurance

Purpose and Need of insurance; Insurance – a social tool; Role of insurance in economic development. Business of insurance – pooling of risk, Fundamental principles of insurance (both Life and General Insurance to be discussed) Perils in Insurance.

Unit 2: Legislative and Regulatory Matters (overview of all the acts to be discussed)

Insurance Act, 1938 Insurance Regulatory and Development Authority Act, 1999, Insurance Ombudsman.

Unit 3: Life Insurance

Meaning of life insurance, Life Insurance Products: Traditional/Unit Linked Policies; Individual and Group Policies; with profit and without profit policies; Whole life products; Annuities; Term

Assurance/ Endowment Assurance; Interest Sensitive Products. Concept of Premium/Bonus, rebate, extra premium, rider premium, surrender value and paid up value. Financial Planning and Insurance, Claim Settlement.

Unit 4: General Insurance (Scope, coverage, exclusions and conditions of these insurance to be discussed)

Marine and Motor Insurance, Health Insurance, Personal Accident Insurance, Reinsurance, Meaning and Significance, Current Scenario in India.

Unit 5: Risk Management

Introduction to Risk. Meaning of Risk. Degrees of Risk. Types of Risk: Static and Dynamic Risks, Financial and Non-financial risks, Pure and Speculative Risks. Risk Management: Characteristics of Risk Management, Significance of Risk Management, Principles of Risk Management, Objectives of Risk Management, the Process of Risk Management, Methods of Risk Management. Risk, Uncertainty, Peril, Hazard, Internal and External Techniques of Risk Management- Internal and External Techniques viz Netting, Matching, Leading, and lagging.

Prescribed Books:

1. Madhumati, R. and Ranganathan, M. (2012). Derivatives and Risk Management. Pearson Education, 1st Impression.

Suggested Readings:

1. Options and Futures- Hull.
2. International Finance- A.V. Rajwade.
3. Derivatives and Risk Management- RajivSrivatava.
4. Commodity Futures and Options- GeorgeKleiman.
5. Indian Financial System – Machiraju, Vikas Publishing House, 2002, 2ndEdition.

COURSE CODE	MB406C
COURSE TITLE	STRATEGIC FINANCIAL MANAGEMENT
COURSE CREDITS	3

Course Description :

This strategic financial management course will enhance students understanding of how financial decisions create value for a firm. Students are introduced to the areas of business valuations, mergers and acquisitions, leverage buyouts, and corporate financing and capital structure. The course will enable students to build an understanding of how strategic financial decisions are taken and how the outcomes are quantified. Additionally the course aims at enabling students to assess and manage corporate risks.

Course Objectives:

1. To make students aware about conceptual knowledge & framework of SFM.
2. To understand the financial aspects of compensation management, negotiation and voluntary retirement scheme.
3. To be able to do financial analysis with regard to corporate valuation and financial restructuring.
4. To be able to know the benchmarking practices and innovative ideas which is expected in financial engineering.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
406C.1	Remember	DEFINE the basic terminologies of strategic financial management
406C.2	Understand	EXPLAIN financial and non-financial performance measures
406C.3	Apply	UNDERTAKE valuation of business enterprise
406C.4	Analyze	ANALYSE brand value in corporate restructuring
406C.5	Evaluate	COMPARE innovative ideas and benchmarking practices
406C.6	Create	DEVELOP reports on financial performance of the firms

Course Contents:

Unit 1: Conceptual Framework

Meaning of SFM, Evaluation of costs and benefits, Reasons for managing business financially, Strategy and strategist, 9-s model for SFM.

Unit 2: Investment decisions

Investments Decisions under Risk and Uncertainty – Techniques of Investment Decision Sensitivity Analysis and Simulation Method – Corporate Strategy and High Technology Investments.

Unit 3: Corporate valuation

Reasons for valuation of business enterprise, Different.

Approaches to enterprise valuation: Market Related Valuation-At replacement cost and realizable value, Future cash flows, Market Capitalization, Economic value added approach.

Unit 4: Corporate Restructuring

Introduction, Concepts and framework, Types of restructuring – Enhancing shareholder and corporate value through corporate restructuring.

Debt and Equity restructuring, Spin offs, Mergers and acquisitions, Capital Restructuring, Buy back of shares.

Unit 5: Overview of financial engineering

Meaning, Benchmarking practices, Off balance sheet financing, Funding strategies, monitoring & assessment, Programs & policies to reward various stakeholders, Innovative sources of Finance.

Prescribed Books:

1. Prasanna, Chandra, Financial Management, Tata McGraw Hill, Delhi, 2007.
2. R. Sofat and P. Hiro, Strategic Financial Management, PHI, New Delhi, 2011.
3. Strategic Financial Management, G. P. Jakhotiya, Vikas Publishing House, 2nd edition, 2012.

GBSRC MBA Syllabus

COURSE CODE	MB407C
COURSE TITLE	BEHAVIOURAL FINANCE
COURSE CREDITS	3

Course Description:

This course is designed to provide an overview of fast growing area in finance. Its premise is that investment decision-making and investor behaviour are not necessarily driven by 'rational' considerations but by aspects of personal and market psychology. Behavioural finance recognises that one's abilities to make complex financial decisions are limited due to the biases and errors of judgement to which all are prone. This course introduces cognitive biases, discusses the impact of such biases on the financial decision-making, and explores the behaviour of individual investors.

Course Objectives:

1. To help students gain understanding of the differences between the neoclassical model of behavior and behavioral finance models.
2. To introduce students to an alternate framework for understanding price discovery in the markets.
3. To enable students analyse the impact of uncertainty on decision making and market movements.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
407C.1	Remember	STATE the meaning, importance of Behavioral finance and enumerate its impact.
407C.2	Understand	DISCUSS models on Cognition and decision making theories.
407C.3	Apply	MAKE USE OF concepts of efficient market hypothesis, adaptive market hypothesis and related concepts of behavioral finance.
407C.4	Analyze	EXAMINE the contribution of neuro finance in behavioral finance
407C.5	Evaluate	JUSTIFY various behavioral aspects of Investing and financial decision making.
407C.6	Create	ASSEMBLE various behavioral financial models which are custom fit for an organization.

Course Outline:

Unit 1: Foundations and Psychological Concepts

Meaning of Behavioural Finance. Importance of Behavioural Finance to practitioners, Prospect Theory, Implication on choice behavior, Disposition Effect and its role in investor behavior.

Unit 2: Behaviour and its formation

Models – Cognition, Cognitive dissonance, Cognitive bias, Emotions, Perception, Errors of perception, Decision making, Herbert Simon and bounded rationality, Heuristics and its relevance – Theories of Decision Making, Personality traits and risk attitudes.

Unit 3: Foundations of Behavioural Finance

Efficient Market Hypothesis – theoretical foundations and challenges to EMH; Adaptive Market

Hypothesis; Noise-trader; Professional arbitrage; Herd behavior.

Unit 4: Neurofinance

Neural process and decision making, Contribution of Neurofinance in Behavioural finance, Frauds and Psychology behind it, Theories of fraud, Prevention of Fraud, Financial Institution Fraud.

Unit 5: Behavioural Aspects of Investing

Behavioural Portfolio Theory – basic ingredients; market outcomes – size effect, seasonality, momentum and reversal; post-earnings announcement drift, equity premium puzzle, Behavioural Asset Pricing Model; Value Investing – central tenets, evidence, and prospects.

Prescribed Books:

1. Prasanna Chandra, Behavioural Finance, TMH, New Delhi.
2. Suchitra Singh and Shilpa Bahl, Behavioural Finance, Vikas Publications, New Delhi.

Suggested Reading:

1. Ackert L and R Daves, Behavioural finance: Psychology decision making and Markets, South western, Centage learning, Mason, Ohio.
2. Bisen, Pandey: Learning Behavioural Finance, Excel Books.
3. Montier, James: Behavioural Finance, John Wiley & Sons, New York.
4. Sheiter A, Inefficient Markets: An Introduction to behavioural finance, Oxford University press, Oxford.
5. Sulphey, M. M.: Introduction to Behavioural Finance, PHI Learning P. Ltd., New Delhi.

GBSRC MBA Syllabus

ELECTIVE II : HUMAN RESOURCE MANAGEMENT

COURSE CODE	MB401D
COURSE TITLE	CASES IN MANAGEMENT (HR)
COURSE CREDITS	3

Course Description:

The course aims to get the students thinking and discussing issues pertaining to management drawing on what they already know. To increase awareness and knowledge of contemporary management issues and to allow students the opportunity to discuss and critically analyse source materials, in order to both enhance their understanding of the topics and to practice their analytical and debating skills.

Course Objectives:

1. To give students the confidence and experience of debating issues on the managerial command.
2. To give exposure exposure of real life Business situation and decision making with the best possible use of resources.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
401D.1	Remember	LIST OUT various HRM concepts used in the case.
401D.2	Understand	DISCUSS various concepts, theories, models, principles and frameworks learned in HRM in analyzing the cases of HRM
401D.3	Apply	EXAMINE the HRM Cases using HRM Theories, Models, and Frameworks while keeping the current business environment in mind.
401D.4	Analyze	JUSTIFY the given cases of HRM with reference to the current trends and best practices in HRM
401D.5	Evaluate	TEST a given case of HRM with reference to current trends, best practices in HRM.
401D.6	Create	CONSTRUCT a case in any one of the given HR concept or problem or scenario.

Course Outline:

To facilitate student learning, a range of source materials will be used throughout the course to direct and stimulate discussion, course will be having five case studies from the contemporary topics of the specializations of management students which is to be discussed in the class room by respective subject faculty. Students are also encouraged to put forward their own ideas for sessions, and to contribute source materials where appropriate to increase engagement in, and relevance of, the course for students. Case analysis and presentations will be an integrate part of learning case studies.

CASES IN MANAGEMENT (HR)

1. Five cases to be discussed analyzed and presented from the following topics.
2. Following are the suggested topics however are not limited and open for contemporary topics.
 1. Employee welfare and security
 2. Compensation and benefits
 3. Talent acquisition
 4. Work-life balance
 5. Employee motivation and engagement
 6. Wage and salary administration
 7. Performance management
 8. Job analysis and evaluation
 9. Workforce diversity
 10. Strategic human resource management

GBSRC MBA Syllabus

COURSE CODE	MB402D
COURSE TITLE	KNOWLEDGE MANAGEMENT
COURSE CREDITS	3

Course Description:

Knowledge Management course addresses contemporary issues in managing knowledge, intellectual capital and other intangible assets by discussing the fundamental concepts of knowledge and its creation, acquisition, representation, dissemination, use and re-use, the role and use of knowledge in organizations and institutions, KM systems and its application in knowledge generation and transfer, and in the representation, organization, and exchange of knowledge, knowledge codification and system development, its testing, KM tools and portals, and finally ethical, managerial and legal issues in knowledge management.

Course Objectives:

1. The objective of this course is to prepare students to understand the current theories, practices, tools and techniques in knowledge management (KM) to deal with the challenges with the organization and management of knowledge.
2. To make the students realize the importance of capturing knowledge elements and its structures application as a competitive advantage to business.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
402D.1	Remember	STATE various concepts, types & implications of Knowledge Management
402D.2	Understand	DESCRIBE various concepts, theories, models, framework of Knowledge Management, Knowledge codification and system development: codification, system testing and deployment, Knowledge transfer and knowledge sharing- the role of culture and structure.
402D.3	Apply	USE appropriate knowledge management tools and portals for extracting effective inferences from data.
402D.4	Analyze	RELATE design and development of knowledge management system for effectiveness.
402D.5	Evaluate	JUSTIFY the effectiveness of Knowledge Management practices.
402D.6	Create	DESIGN an innovative Knowledge Management system in a given organization.

Course Outline:

Unit 1: Introducing the concept of KM

Why KM, KM system life cycle, and aligning KM and business strategy. KM Cycle: Knowledge creation, capturing tacit knowledge.

Unit 2: Types of knowledge and its implications for KM

Knowledge codification and system development: codification, system testing and deployment, Knowledge transfer and knowledge sharing- the role of culture and structure.

Unit 3: KM system

Analysis design and development: Knowledge infrastructure, Knowledge audit, and knowledge team. KM system : Analysis design and development: Analysis, design and development of KM system.

Unit 4: KM tools and Portals

Inferences from data, data mining and knowledge portals.

Unit 5: Evaluation of KM effectiveness

Tools and metrics Ethical, legal and managerial issues. KM experiences from Indian companies, KM innovation and Learning organization, The future of KM.

Prescribed Books:

1. Knowledge Management. Awad, E.M (2007). Pearson India, Delhi.
2. Knowledge Management: System and Resources. Fernandez I. B. and Sabherwal, R. (2010). PHI Delhi.
3. Knowledge Management for the Information Professional, Srikantaiah.T. K., Koenig, M., Information Today, Inc., 2000.

Suggested Readings:

1. Knowledge Management in Theory and Practice. Kimiz Dalkir (2005). Elsevier.
2. The Knowledge Management Toolkit, Tiwana Amrit (1999). Prentice Hall PTR.

GBSRC MBA Syllabus

COURSE CODE	MB403D
COURSE TITLE	HR PERSPECTIVES IN MERGERS AND ACQUISITIONS
COURSE CREDITS	3

Course Description :

The course has described the role of HR in mergers and acquisitions. Mainly the course deals with the HR leadership that can lead the organization's efforts to identify potential business and human capital risks, and shape the strategy and integration plan. Though there are no magical formula to avoid these side effects, yet with HR playing a leadership role from the beginning of the M&A process, it is more likely that the organization optimize a deal's financial and operational synergies.

Course Objectives:

1. To familiarize the students with the Conceptual framework relating to M&A and Organization integration.
2. To enable students to understand Human and cultural related issues arising out of M&A.
3. To understand various roles of HR functionaries in dealing with M&A.
4. To build competencies in the participants to manage people and culture related issues during an M&A process.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
403D.1	Remember	DEFINE the meaning, concepts, terms, issues, frameworks and policies related to HR in the field of Mergers & Acquisitions.
403D.2	Understand	DESCRIBE the implications of M&A from the perspectives of HR framework including employees, managers, organizations, global market, govt. policies etc.
403D.3	Apply	DEMONSTRATE the Models, Principles and Frameworks of M&A with respect to strategic HR dynamics in organizational setting.
403D.4	Analyze	EXAMINE the role of HR and other functions in dealing with M&A.
403D.5	Evaluate	SELECT HR appropriate Competencies in Managing M&A to integrate the changes and future needs.
403D.6	Create	DESIGN various strategies for integrating and maintaining organizational culture after M&A.

Course outline:

Unit 1: Concept of Mergers and Acquisitions

Meaning, Organizational Growth through M&A, Strategic Drivers of M&A, phases of merger, The Indian Scenario of M&A.

Unit 2: Issues in M&A

Organizational Vision and Mission, HR policies, Managing Ambiguity, Attracting and retaining

top performers, Utilizing and managing excess manpower, Managing insecurity and stress.

Unit 3: Strategic Dynamics of M&A

M&A in historical perspective, Developing integration models, Human Due diligence, Implementing the integration plan, Downsizing and Restructuring.

Unit 4: HR role in managing M&A

Role of HR in Managing change through M&A, HR Competencies in Managing M&A, Preliminary stage (establishing people and culture fit), HR intervention in M&A phase, Post M&A roles.

Unit 5: Organization Change

Sources of Change, Rethinking Organization Change, History of Change, Nature of Change Level of Change, Models of Change, Leading Organization Change, Integration and Future Needs.

Prescribed Books:

1. Mergers and Acquisitions from A to Z, Andrew J Sherman, Milledge A Hart
2. The Complete Guide to Mergers and Acquisitions: Process Tools to Support M & A Integration at Every Level by Timothy J Galpin and Mark Herndon John Wiley and Sons.
3. Organization Change : Theory and Practice, 3rd Sage South Asia Edition, W Warner Burke

Suggested readings:

1. Rajesh Kumar, B (2011). Mergers and Acquisitions Text and Cases, 1/e; New Delhi: Tata McGraw Hill
2. Aurora, Shetty, Kale; Mergers and Acquisitions, Oxford University Press, Latest Edition

GBSRC MBA Syllabus

COURSE CODE	MB404D
COURSE TITLE	ORGANIZATIONAL CHANGE AND DEVELOPMENT
COURSE CREDITS	3

Course Description:

Organization development (OD) is a field of research, theory and practice dedicated to expanding the knowledge and effectiveness of people to accomplish more successful organizational change and performance. This course extends on OD to focus on aligning organizations with their rapidly changing and complex environments through organizational learning, knowledge management and transformation of organizational norms and values.

Course Objectives:

1. To understand the nature of the developmental process in organizations.
2. To comprehend the main derives and approaches of the change.
3. To Provide students with knowledge of resistance to change and techniques of handling it.
4. To equip students with knowledge of ongoing activities within an organization and design and plan the implementation of selected OD interventions.
5. To realize and apply the stages of the organizational development process.
6. To equip students with knowledge and skills required for effective change and organizational development.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
404D.1	Remember	DESCRIBE the concept of Organizational Development (OD) in detail and DISCUSS the evolution of Organizational Development
404D.2	Understand	EXAMINE the foundation of Organization Development and to STUDY the different theories and models that helps in improving the organizational functioning.
404D.3	Apply	ANALYSE and manage the OD process and EXPERIMENT the Change in OD process.
404D.4	Analyze	IMPLEMENT the knowledge and skills required for effective change and organizational development.
404D.5	Evaluate	MEASURE the nature and classification of the OD interventions and to Classify the strategies of OD useful in organizational effectiveness.
404D.6	Create	GENERATE HR Metrics for Organization that link HR objectives to strategic business activities which enables the accessibility of information for proper managerial decision.

Course Contents:

Unit 1: Definition, Values and Assumptions, Importance, Evolution

Kurt Lewin, Robert Tanenbaum, McGregor, Herbert Shepard, Robert Blake.

Unit 2: Foundations of OD

Action Research, Survey Feedback, Systems Theory, Teams and Teamwork, Participation and

Empowerment, Applied Behavioural Science, Parallel Learning Structures.

Unit 3: Process Of OD – Model Of Change, Six Box Model.

Unit 4: OD Intervention

Meaning, Importance, Team Intervention: Role Analysis, Interdependency, Appreciation and Concern Inter group: Walton, Principled Negotiation Structural: Sts, Work Redesign, Self-Managed Teams. Individual: T-Group, Behaviour Modeling.

Unit 5: Human Resource Metrics and Analytics

Client and Consultant Relationship, HR scorecard, Implementation of HR Metrics.

Prescribed Books:

1. Organisational Development By S Ramnarayan, T VRao.
2. Organisational Development And Change By Cummings And Worley (7th Edition)
3. Organisational Development By French And Bell (6th Edition)

GBSRC MBA Syllabus

COURSE CODE	MB405D
COURSE TITLE	INTERNATIONAL HRM
COURSE CREDITS	3

Course Description:

This course is designed to acquaint the students with the International Human resource Management. The students will get knowledge of various problems faced by International HR managers. The most noticeable aspect of international boundaries is crossing the national boundaries. Organizations need International HRM because of the international market opportunities more today Knowledge about international HRM, therefore assumes great relevance for the upcoming Global managers.

Course Objectives:

1. To familiarize the students with the diversity of HRM in an international context and the key HR challenges facing organizations working internationally.
2. To emphasize on developing a theoretical grasp of issues and problems and an understanding of practical implications of various theories of human behavior at work.
3. To acquaint students with the Emerging Trends in Employee Relations and Employee Involvement, International Labour Standards in modern global organizations.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
405D.1	Remember	STATE the issues, opportunities and challenges pertaining to international HRM.
405D.2	Understand	IDENTIFY complexities and competency in dealing with cross cultural situations.
405D.3	Apply	IMPLEMENT the strategic and functional roles of HRM in various international contexts, especially in areas such as recruitment and selection, performance management, training, learning and development, career management, compensation, motivation and repatriation.
405D.4	Analyze	COMPARE between external & internal forces (e.g. globalization, sociocultural changes, political and economic changes) that have the potential to shape international HRM.
405D.5	Evaluate	APPRAISE International Procedures for Human Resource activities.
405D.6	Create	DESIGN generic transferable skills-especially in diagnosing international HRM issues by conducting research and developing way-out from cross border conflicts.

Course Contents:

Unit 1: Human Resources in a Comparative Perspective, Context of IHRM, Organizational Context of IHRM, Understanding Self: Indian Perspective, Cross Cultural Management Role of IHRM in Sustaining the International Business Operations.

Unit 2: International Recruitment and Selection: Recruiting and Selecting International Staff,

Training and Development of International Staff, Developing International Staff and Multinational Teams.

Unit 3: International Compensation Approaches to International Compensation, Cultural Factors/Issues in Performance Management, Performance Management for International Staff.

Unit 4: Repatriation, Managing Global, Diverse Workforce, Industrial Relations in a Comparative Perspective, Global Unions, Regional Integration and Framework Agreements.

Unit 5: Emerging Trends in Employee Relations and Employee Involvement, International Labour Standards, HR/IR issues in MNCs and Corporate Social Responsibility, IHRM Trends and Future Challenges.

Prescribed Books:

1. International Business –By K Ashwathappa, TATA McGraw-Hill publication, Third edition.
2. International Business-Competing in the Global Marketplace by Charles W Hill and Arun K Jain, TATA McGraw-Hill publication, Sixth edition.
3. International Business –Strategy, Management And The New Realities By S.TamerCavusgil, Gary Knight and John R. Reisenberger, Pearson Publications, First Edition.

GBSRC MBA Syllabus

COURSE CODE	MB406D
COURSE TITLE	TALENT RETENTION AND EMPLOYEE ENGAGEMENT
COURSE CREDITS	3

Course Description:

The scope of the course on Talent Retention and Employee Engagement covers entire spectrum of Human Resource Management - starting from talent planning, talent acquisition, talent management and performance management talent development, talent retention, talent performance, career planning, coaching and talent engagement.

Course Objectives:

1. To understand the scope and challenges retaining and engaging talent at every level at the work place thereby talent performs and gets aligned to the mission, vision, values and objectives of the organization.
2. To expose to the students to the latest trends in talent management and talent engagement by exposing through case studies, issues, exercise, researching on various organizations at different levels and industries.
3. To prepare the students to meet industry needs with regards to knowledge, aptitude, attitude in understands the workforce diversity and culture in managing and engaging the talent.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
406D.1	Remember	DEFINE the concepts, nature & significance of Talent Management.
406D.2	Understand	DISCUSS career & succession planning with performance management.
406D.3	Apply	INTERPRET the organizational competency level through succession planning and career planning which enables to recognize the potential and workforce development.
406D.4	Analyze	COMPARE between the concept Coaching, Training and Development which helps to Facilitate and support management to implement accurate hiring and promotion decisions.
406D.5	Evaluate	JUDGE how employee engagement initiatives help in improving employee morale and thereby retaining employees for organizational development.
406D.6	Create	DEVELOP a talent management plan using different strategies to sustain organizational excellence.

Course Contents:

Unit 1: Introduction to Talent Management

Introduction, nature and significance of Talent management.

Unit 2: Competency Assessment and Performance Management

Definition, concept Definition and different methods of performance appraisal.

Unit 3: Succession and Career Planning

Characteristic, Types of Succession Planning, Elements of Succession Planning, Definition and

Concepts of Career planning, Advantages and Disadvantages of Career Planning.

Unit 4: Coaching, Training, and Development

Introduction to Training concept, Meaning, Need for Training, Importance of Training, objectives of training, Education, training and development. Driving Cultures of Success.

Unit 5: Employee Engagement

Definition, Importance, employee engagement linkage to business outcomes, Approaches to employee engagement, employee engagement strategy, and employee engagement survey.

Prescribed Books:

1. Human Resource Management by K Ashwathappa, TATA McGraw-Hill publication, Thirdedition.
2. Human Resource Management by John M Ivancevich, TATA McGraw-Hill publication, Thirdedition.

GBSRC MBA Syllabus

COURSE CODE	MB407D
COURSE TITLE	COMPETENCY MAPPING & CAREER DEVELOPMENT
COURSE CREDITS	3

Course Description:

Managerial competence and career development course will help students on how to develop and map competencies, and design competency models. It is designed to help the management students understand the complexities and dynamics of competency models and related decision making. It will help students to design and implement the appropriate competency framework. It will also help management students understand the application and know-how of competency mapping, which is primarily to develop the capacity to act, implement, and bring performance improvement in the workplace.

Course Objectives:

1. To appreciate environment the importance of career strategies in a rapidly changing.
2. To develop an awareness of various career orientations and strategies of individual career planning.
3. To develop an understanding in designing appropriate systems of competency mapping & organizational career development.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
407D.1	Remember	DEFINE the concept of competency in detail and LIST the models and techniques of competency mapping used in organization and career development.
407D.2	Understand	IDENTIFY implications of competency mapping and career development.
407D.3	Apply	MAKE USE OF various competency Models, Principles and Frameworks of competency mapping with respect to career transition and career development.
407D.4	Analyze	RELATE the role of a leader, an individual in spreading awareness of various career orientations and strategies of individual career planning.
407D.5	Evaluate	SELECT strategies and challenges which helps to develop and map competency techniques in career planning and Development.
407D.6	Create	DESIGN efficient system for competency mapping which tends to be useful in organizations career development.

Course Contents:

Unit 1: History & Origin of Competency

KSA v/s Competency Reasons for Popularity of Competency, - Competency & EVA, Views Against Competency - Definitions Confusion about Competency.

Unit 2: Components Of Competency

Skill, Knowledge & Motive - Trait & Self-Concept, Iceberg Model of Competency - Operant &

Respondent Traits of Competency, Competency Models - Leadership and managerial competency models - Causes for Resistance and Recommended Actions to Address - Delphi Technique Competencies & Generic Indicators - 360 Degree Feedback - HR Generic Competency Model - Supervisory, Generic Competency Model.

Unit 3: Competency Categories

Threshold Competencies - Differentiating Competencies - Generic or Key Competencies - Functional or Technical Competencies - Leadership or Managerial Competencies, Steps in Developing Competency Model - Determining the objective & Scope - Clarifying Implementation Goals & Standards - Create an Action Plan - Define Performance. Effectiveness Criteria - Identify a Criterion Sample - Data Gathering & Interim Competency Model - Finalize & Validate, Competency Model.

Unit 4: Career Development

Theoretical Foundations, Objectives, Definition of Career Development, Process of Career Planning, Reasonability for Career Planning & Career Development Methods of Career Development (Management), Competency Approach to Development, Career Paths, Career Transition, Competency Approach to Development.

Unit 5: Innovative Employer Career Initiatives

Different methods used by employer's to enhance employee career, Special Issues in Career Development, Mentoring for Employee Development.

Prescribed Books:

1. Competency Based HRM, Ganesh Shermon, TMH, 1st Edition, 2002. A handbook of Competency mapping – Seema Sangvi, Response Books, 2004.
2. Human Resource Management, Pravin Durai, Pearson 2010.
3. Human Resource Management, Gary Dessler & biju Varkkey, Pearson, Twelfth Edition, 2011.

Suggested Reading:

1. Calvin S, Theories of Personality, Hall Et Al, Wiley Publication John.W.Newstrom and Keith Davis Tata, Organizational Behaviour - Human Behavior at work, McGraw Hill, 11/e, 2003.
2. Robert N. Lussier, Human Relations in organizations, 6th edition, Mc- Graw Hill Education.
3. Stephen Robbins, Training in Interpersonal Skills – tips for managing People at work, Et al, Pearson, PHI.
4. Udai Parek, Understanding OB, Oxford University Press.
5. Whetten & Cameron, Development Management Skills, 7th Ed. Pearson, PHI.

PHARMACEUTICAL MANAGEMENT SPECIALIZATION

COURSE CODE	MB401E
COURSE TITLE	CASES IN MANAGEMENT (PHARMA)
COURSE CREDITS	3

Course Description:

The course aims to get the students thinking and discussing issues pertaining to management drawing on what they already know. To increase awareness and knowledge of contemporary management issues and to allow students the opportunity to discuss and critically analyse source materials, in order to both enhance their understanding of the topics and to practice their analytical and debating skills.

Course Objectives:

1. To give students the confidence and experience of debating issues on the managerial command.
2. To give exposure exposure of real life Business situation and decision making with the best possible use of resources.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
401E.1	Remember	FIND out various environmental factors affecting on Pharma and Healthcare industry.
401E.2	Understand	EXPLAIN the various laws applicable to Pharma and Healthcare industry.
401E.3	Apply	IDENTIFY the situations and rights of legal way to solve the problems.
401E.4	Analyze	CONSTRUCT the different laws to developed by constitutions to support and protect Pharma sector.
401E.5	Evaluate	EVALUATE architecture for routine business activities in pharma.
401E.6	Create	Student are able to ADAPT the culture of Pharama and Healthcare industry.

Course Outline:

To facilitate student learning, a range of source materials will be used throughout the course to direct and stimulate discussion, course will be having five case studies from the contemporary topics of the specializations of management students which is to be discussed in the class room by respective subject faculty. Students are also encouraged to put forward their own ideas for sessions, and to contribute source materials where appropriate to increase engagement in, and relevance of, the course for students. Case analysis and presentations will be an integrate part of learning case studies.

CASES IN MANAGEMENT (FINANCE)

1. Five cases to be discussed analyzed and presented from the following topics.
2. Following are the suggested topics however are not limited and open for contemporary topics.
 1. Pharma Logistics Management.
 2. Relationship selling
 3. Pharma Sales strategy
 4. Pharm Distribution Strategy
 5. New product launch strategy
 6. Manufacturing and regulatory affairs
 7. Pharma product strategy
 8. Pharma Brand strategy
 9. Missionary selling
 10. Environmental scanning

GBSRC MBA Syllabus

COURSE CODE	MB402E
COURSE TITLE	ADVERTISING & SERVICE MANAGEMENT IN PHARMACEUTICAL INDUSTRY
COURSE CREDITS	3

Course Description :

This course is designed to impart basic knowledge on managerial process designed to oversee and control the various advertising activities involved in a program to communicate with a firm's target market and which is ultimately designed to influence the consumer's purchase decisions.

Course Objectives:

1. To analyse the unique challenges of services marketing, including the elements of product, price, place, promotion, processes, physical evidence, and people.
2. To design service quality measurements to build customer loyalty and evaluate the effectiveness and efficiency of customer service offerings.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
402E.1	Remember	DEFINE the Meaning, Classification, Market research and data analysis of advertising and service management.
402E.2	Understand	DEMONSTRATE product life cycle and SHOW product portfolio analysis.
402E.3	Apply	IDENTIFY the role of a Pharmaceutical Brand Manager; the 'Little CEO' concept, 'Science meets Commerce' concept.
402E.4	Analyze	CATEGORIZE the Fundamentals of Pharmaceutical Marketing.
402E.5	Evaluate	ASSESS the Portfolio Analysis by factoring key determinants.
402E.6	Create	DISCUSS the strategies of advertising and services for Pharmaceutical industries.

Course Contents:

Unit 1: Overview of Advertising Management

Introduction, Meaning and Framework of Advertising; Defining Advertising; Advertising to Persuade the Buyer; Importance of Advertising in Marketing; Role of Advertising in Marketing Mix and Positioning; Advertisers and Advertising Agencies; Choosing an Advertising Agency, Online advertising – effective use of advertising campaign for maximizing value to the patients.

Unit 2 : Services Marketing

Meaning - nature of services - Types and importance - Relationship marketing - Mission, strategy, elements of design, marketing plan market segmentation, Defining Pharma Brand's Goals, objectives for the Advertising Campaign, various analytics platforms used for Pharma online

advertising.

Unit 3 : Marketing Mix Decisions

Review the basics of advertising pharmaceutical products, unique features of developing, pricing, promoting and distributing services - Positioning and differentiations strategies, quality of service industries - Achievement and maintenance, customer support service, list of countries allowing pharmaceutical advertising, types of pharmaceutical advertisements which are allowed.

Unit 4 : Nature and Scope of Digital Advertising Strategy

Copy design and development digital advertising strategy, Advertising control and Public Relationship, measure campaign performance and identify opportunities to improve pharma brand positioning, Develop an Analytics Plan (Measurement Model) for your Pharma Ad Campaign.

Unit 5 : Marketing of Pharmaceutical and Hospital Services

Understanding the services provided in hospitals and clinics. Understanding the after sale services for any medical and pharmaceutical instruments. Marketing of Non-Profit Organisations :- Services offered by charities - Educational service - miscellaneous services - Power and Telecommunication.

Prescribed Books:

1. Services Marketing - Indian experiences - Ravishankar - South Asia Publication 1998, Delhi.
2. Services Marketing: Integrating Customer Focus across the Firm – Valarie A Zeitnamd and Mary Jo Bitmer, 3 rd Edition, TMH, 2003.
3. Services Marketing - Text & Readings - P.K. Sinha & S.C.Sahoo - Himalaya, Mumbai.
4. Essence of Services Marketing - Adrian Pyne - Prentice Hall of India, New Delhi.
5. Services Marketing - Lovelock - Prentice Hall.

Suggested Readings:

1. Services Marketing - Jeithaml - I.S.E.
2. Services Marketing - Gousalves - Prentice Hall.
3. Services Marketing - Principles & Practice - Palmer, Prentice Hall.
4. Services Marketing - Woodruffe - McMillan. 10. Ravi Shankar, Services Marketing, Excel, 2
5. Services Marketing - S.M.Jha - Himalaya Publishing Company 1998, Mumbai.

COURSE CODE	MB403E
COURSE TITLE	PHARMA AND HEALTHCARE MANAGEMENT
COURSE CREDITS	3

Course Description:

Healthcare in India is still in its initial stages and there is a huge requirement for professionals who understand the dynamics of the healthcare industry. By combining this with Pharmaceutical Management syllabus helps the students in becoming efficient and creative managers pertaining to media, Pharma as well as Healthcare Industry as Pharmaceutical & Healthcare companies face similar challenges. The course is developed to provide students with in-depth knowledge about healthcare and pharma world and its dynamics. This course in Pharma and Healthcare Management teaches various concepts relevant to healthcare professionals and application and relevance of the same with Pharma management.

Course Objectives:

1. To apply the concepts and principles of healthcare and Pharma management in the real world.
2. To develop interpersonal skills, team spirit, leadership qualities and implement them in the Pharmaceutical Management as well as healthcare sector.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
403E.1	Remember	TELL the modern health issues and SHOW the Health care organization's structure.
403E.2	Understand	EXPLAIN the role of Health statistics and WHAT are the Ethics in Pharma and Health care.
403E.3	Apply	IDENTIFY the various Health care policies.
403E.4	Analyze	CONSTRUCT the laws related to Hospitals and Pharma industry in India.
403E.5	Evaluate	EVALUATE the various Applications and policies of Health Care industries: Applicable for students and management.
403E.6	Create	To DESIGN practical Applications for Health reducing health issues.

Course Outline:

Unit 1: Introduction

Global and Indian scenario of Healthcare Industry, components of healthcare industry, role and contribution of various components of healthcare industry for providing value to healthcare services, Industries within the Healthcare Sector, Pharmaceutical healthcare companies and their contribution in healthcare services, Global demand for various healthcare services, opportunities

and challenges for providing the healthcare services by Pharma and Healthcare Industry.

Unit 2: Proactive Approach to Individual's Health and Well-Being

Changing pattern of medical industry and behavior of patients towards their health and well-being, various approaches towards healthcare and change of spending pattern of the patients, expectations from the medical industry and the gap analysis.

Unit 3: New Technologies Leading in Innovation

Telemedicine to improve medical equality, private sectors and India's Medical Device Performance, government rules and regulations towards new technologies in pharma and healthcare sectors, Digital health strategies offering growing commercial opportunities for pharmaceutical firms.

Unit 4: Digital Health and Pharmaceutical Market

Concept, meaning, various digital platforms of medical industry, improvements in healthcare due to digital platforms, customer expectations from Pharmaceutical market and gap analysis, drug developments useful for various systems of human body.

Unit 5: Emerging Trends in Pharma and Healthcare Sectors

Digital Approaches to address Healthcare Challenges, emerging trends in pharmaceutical sector, emerging trends in healthcare sector. Significance and management of health during pandemic scenario, Vision 2030: opportunities due to digital innovation in pharma and healthcare sectors.

Prescribed Books:

1. Sawant, D. A. Pharmaceutical sciences pharma pathway: pure & applied pharmacy 15th edition.
2. Pharmaceutical Management by Sachin Itkar, 3rd Edition.

Suggested Readings:

1. The Creative Destruction of Medicine: How the Digital Revolution Will Create Better Health Care- by Dr. Mike Topol.
2. First, Break All the Rules: What the World's Greatest Managers Do Differently by Marcus Buckingham and Curt Coffman.

COURSE CODE	MB404E
COURSE TITLE	INTELLECTUAL PROPERTY RIGHTS AND LEGAL ASPECTS IN PHARMACEUTICAL INDUSTRY
COURSE CREDITS	3

Course Description :

It is well established that there is tension in the application of the new regime of Intellectual Property Rights in the Pharmaceutical Industry, especially in developing countries like India. The main purpose behind this study debate on the amendment of the Indian Patent Act, 1970 and the implementation of the TRIPS Agreement, critically analyzing the hypothesis that Intellectual Property Rights are necessary and need to be protected and also on the sufficient evidence to question this premise. Speculation and analysis of the Post-TRIPS, technological, economical and sociological behavior of the Indian Pharmaceutical Industry and the challenges faced by it, also formed the reason behind the present study.

Course Objectives:

1. To demonstrate and complete academic projects and get awareness of acquiring the patent and copyright for their innovative works.
2. To demonstrate the plagiarism in the students innovations which can be questioned legally.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
404E.1	Remember	LIST out the rights for the protection of invention done in their project work.
404E.2	Understand	UNDERSTAND the role of Indian (Amendment) Patents Act, 2005 and the TRIPS Agreement.
404E.3	Apply	DEMONSTRATE Post-TRIPS, technological, sociological and economical changes in the Indian Pharmaceutical Industry.
404E.4	Analyze	ANALYZE the registration process in our country and foreign countries for invention & designs. COMPARE the exponential growth and development brought in by the introduction of the new Intellectual Property Rights regime with the hazardous relentless march of the Intellectual Property Rights bringing in contradiction to the public interest.
404E.5	Evaluate	EVALUATE the various legal aspects and rights required in Indian Pharmaceutical Industry
404E.6	Create	TEST the accessibility of flexibilities guaranteed by the TRIPS and various act Agreement.

Course Contents:

Unit 1: The Contract Act, 1872 (Sections 1 to 75) – Nature and classification of contracts- Essential elements of valid contract-Offer and acceptance, Consideration, Valid consideration,

Capacities of parties-Provisions related to free consent, valid agreement- Provisions related performance and discharge of contract- Breach of contract, meaning and remedies for breach of contract- Contingent contracts, quaasi contracts, wagering agreements.

Unit 2: Provisions relating to Agency (Sections 182 to 238) – Agent and principal, Creation of agency, Ratification, classification of agents- Relationship amongst principals, agents and sub-agents – Agent’s authority, revocation, renunciation etc.- Rights, duties and liabilities of agents and principals- Termination of agency – Contracts of indemnity and guarantee.

Unit 3: The Sale of Goods Act,1930.- Contract of sale of goods- meaning of sale of goods and agreement to sell- essentials and formalities of contract of sale, sale and hire agreement. – Provisions relating to conditions and warranties - Provisions relating to transfer of property or ownership - Provisions relating to performance of contract of sale, rights of unpaid seller, remedial measures - Provisions relating to auction sale.

Unit 4: The Negotiable Instruments Act, 1881 – Meaning of negotiable instrument, its characteristics, types – holder and holder in due course – negotiations and types of endorsements, Dishonour of negotiable instrument – noting and protest.

Drug Control Order and role of Food And Drug Administrator.

Unit 5: Introduction to The Consumer Protection Act, 1986. – Definitions of consumer, a person, goods, service, trader, manufacturer – Meaning of consumer dispute, complaint, unfair trade practice and restricted trade practice – Consumer protection councils – Consumer dispute redressal agencies.

Companies act, 1956 – Definition and meaning of Company – Main features of a Company – Types of Companies – Incorporation of Companies – Provisions related to capital structure - Provisions related to Directors.

WTO and TRIPS

Prescribed Books:

1. N.D. Kapoor - Mercantile Law.
2. M.C. Kunchal – Mercantile Law.
3. K.K. Gujrat - Indian Law of Patents.

COURSE CODE	MB405E
COURSE TITLE	PHARMACEUTICAL EXPORT MANAGEMENT
COURSE CREDITS	3

Course Description:

Our pharmaceutical companies are trying their best to achieve remarkable export sale in the international markets. This also provides quality management with special focus on pharmaceutical management for developing business leaders by nurturing knowledge, skills, communication, attitudes and behavior. Pharmaceutical export is contributing to the GDP of the country and every year this contribution is positively growing. The content of the course is designed to address the challenges facing the pharmaceutical industry. The Indian pharmaceutical company has been built from an industry that copies patent drugs and manufactures them inexpensively. Now it is counted amongst the industries that are fuelling India's economic growth and holds enormous potential. Indian-based pharmaceutical companies are also predicted to gain considerable market share in the world. It holds rank worldwide, in terms of technology, quality and range of medicines manufactured. Thus the course concentrates on the Pharmaceutical Export: Facts and Challenges that should not be ignored.

Course Objectives:

1. To understand International environment for Pharmaceutical Exports and Competitiveness of Indian Pharma-products.
2. To understand Global market potential for Pharma-Products as well as supply chain organization for Pharma export from producer to port.
3. To understand Country Risk analysis, Export financing and WTO regulations w.r.t. Pharma products.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
405E.1	Remember	STATE Pharmaceutical Export: Facts and Challenges that should not be ignored.
405E.2	Understand	DISCUSS the challenges facing the pharmaceutical industry.
405E.3	Apply	IDENTIFY export sale in the international markets.
405E.4	Analyze	ANALYSE holding the rank worldwide, in terms of technology, quality and range of medicines manufactured.
405E.5	Evaluate	COMPARE competitiveness Indian Pharma products with International Pharma products.
405E.6	Create	IMPROVE quality management with special focus on pharmaceutical management for developing business leaders by nurturing knowledge, skills, communication, attitudes and behavior.

Course Contents:

Unit 1: International environment for Pharmaceutical Exports, Competitiveness of Indian Pharma-

products.

Unit 2: Global market potential for Pharma-products, Organization of supply chain for Pharmaceutical export – from producer to port.

Unit 3: Pharmaceutical export zones and special facilities for Pharmaceutical exporter, Country risk analysis.

Unit 4: Export promotion schemes for pharma-exports by state and central governments, Export financing.

Unit 5: WTO regulations with special reference to pharma products.

Prescribed Textbook:

1. Case Study- A. V. Vedpuriswar –ICFAIPublications.
2. Case study- Vol.I, II and III By KrishnaphaniKesiraju.

Suggested Readings:

1. Ravi Kiran, Sunita Mishra, 2011. Research and Development, Exports and Patenting in the Indian pharmaceutical company: a Post TRIPS Analysis. Eurasian Journal of Business and Economics, 4 (7) ,53-67.
2. Nilesh Zacharias and Sandeep Farias, 2002. Business Briefing: Pharmatech 2002. IP Rights/Patents, Patents and the Indian pharmaceutical company.
3. Neetu Dubey, R.K. Sharma, Himanshu Gupta, Nitin Dubey and Nidhi Dubey, March-June, 2011.
4. Performance of the Indian pharmaceutical company Pre and Post TRIPS Era: A Study, Asian Journal of Pharmacy and Life Science, Vol. 1 (2), ISSN 2231 –4423.

GBSRC MBA Syllabus

COURSE CODE	MB406E
COURSE TITLE	MARKETING STRATEGY AND PRODUCT LAUNCH DYNAMICS
COURSE CREDITS	3

Course Description:

The product concept holds that consumers will favour those products that offer quality or performance. Managers in these product-oriented organisations focus their energy on making good products and improving them over time. Pharmaceutical marketing is a delicate task, product launching is even more. It is such a complex task that, for every marketer in the pharmaceutical sector it's a challenging experience. The Inter-departmental nature of the jobs makes it extremely interactive. The product manager has to manage so many stakeholders that he has to be very careful about maintaining the balance. Beginning from the initial market analysis and profit-loss analysis, thorough subjective and objective decision making capabilities are required. Meeting the deadline is always important but it becomes more so in case of product launching. The task of launching a pharmaceutical product launching is critical in the sense that, for the company, it is a step forward to capitalize growth opportunities. Launching is also a critical experience for a product manager, it requires interaction with almost every department of a pharmaceutical company. Now it is counted amongst the industries that are fuelling India's economic growth and holds enormous potential.

Course Objectives:

1. To understand how to manage so many stakeholders that he has to be very careful about maintaining the inter-departmental balance.
2. To understand the beginning from the initial market analysis and profit-loss analysis, through subjective and objective decision making capabilities required during product launch.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
406E.1	Remember	CHOOSE the market opportunity for a new product or service in terms of its potential users, as well as its competing and complementary products and services.
406E.2	Understand	INTERPRET the beginning from the initial market analysis and profit-loss analysis, through subjective and objective decision making capabilities required during product launch.
406E.3	Apply	DEVELOP a mature and critical understanding of concepts, theories, and evidence for effective strategic management of new product and new service development from a marketing perspective.
406E.4	Analyze	ANALYSE the market opportunity for a new product or new service in terms of the dynamics of entry timing and the likely trajectory for market development and potential for product-market disruption and/or entrepreneurial transformation.

406E.5	Evaluate	MEASURE various marketing strategies help to Pharma Industry to launch innovative product and services.
406E.6	Create	CHOOSE strategies to manage huge number of stakeholders & the same time maintaining the inter-departmental balance.

Course Contents:

Unit 1: Pharma Industry components: OTC, Research, APIs, Biotech, Generics, Supply Chain, Packaging and CRO, Understanding Patients and Nature of Pharma Industry.

Unit 2: Management of Lab to Launch Process: Drug design and development.

Unit 3: Marketing Objectives of Pharmaceutical Product Launch: New Product Development stages, Market Uncertainty and Developing Dynamic New Product Launch Strategies in Pharmaceutical Marketing.

Unit 4: Positioning, Targeting and Profiling the offerings, Marketing strategies at different Product Life Cycle stages of Pharma Product and Portfolio Management.

Unit 5: Forecasting a Pharma product and sales force management.

Prescribed Textbooks:

1. Product-Pharmaceutical Product development by Chilukuri Sunkara Young; Informa Healthcare.
2. Introduction to Pharmaceutical Practices by Hanan; Engage Learning.
3. Pharmaceutical emerging trends by Anshul Kaushesh; ICFAI.
4. Case studies in Marketing Strategy Vol-II; ICFAI.
5. Case studies in Management by Jham and Gupta; Biztantra.

Suggested Readings:

1. Modern Pharmaceutical Industry by Jacobsen Wertheimer; A Primer.
2. Pharmaceutical Product Branding Strategy- IIInd edition by Mark Paich, Corey, Jason; Informa Healthcare.
3. Case Studies in Marketing Research and Product management; ICFAI
4. Case studies in Management Vol-VI; ICFAI

COURSE CODE	MB407E
COURSE TITLE	PHARMACEUTICAL ADVANCE HUMAN RESOURCE MANAGEMENT
COURSE CREDITS	3

Course Description:

An array of components comprise Pharmaceutical human resource management, such as recruiting, onboarding, benefits enrollment, payroll, talent or workforce management, reporting, time and attendance, and succession and performance management. Pharma human resource management is the connection between a Pharma company's human resources and its strategies, objectives, and goals. The aim of this course is to teach Advance flexibility, innovation, and competitive advantage to develop a fit for the purpose organizational culture.

Course Objectives:

1. To understand the changes in HRM practices (Role and Structure of HR department, Recruitment, Retraining and Redeployment, Performance Appraisal, Compensation, Career Planning and Performance Management System) in Pharmaceutical companies.
2. To understand the importance of the availability of a skilled, committed, & highly motivated workforce in the organization to achieve sustained competitive advantage.
3. To enable to provide direction to the organization so that both the business needs of the organization & the individual & collective needs of its workforce are met.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
407E.1	Remember	DEFINE Management Process and Organization Theory; Individual Behaviour in Organization
407E.2	Understand	EXPLAIN The Human Resource Management in Pharma Industry.
407E.3	Apply	IDENTIFY Managerial Communication Skills help to Development of competative strategies
407E.4	Analyze	CONSTRUCT Quantitative Techniques in Human Resource Management
407E.5	Evaluate	CRITICIZE various PHRM practices for betterment of Pharma Industries.
407E.6	Create	FORMULATE Cross Culture and International Human Resource Management.

Course Outline:

Unit 1: Role of HR Department in Pharmaceutical Company's performance

Role, Functions of HR in Pharma industry, Trends and Overview of HR managers, Changing role of HR managers.

Unit 2: Changing face of PHRM

Evolving PHR operations, Role and Significance of Skills and technology in Changing face of PHRM, Sustainable training programs for PharmaHR operations.

Unit 3: Competitive strategies and PHRM Practices

HRM Best practices, Role and Significance of linking Competitive strategies with PHRM Practices, Achieving competitive advantage through HR practices in Pharma Business.

Unit 4: Aligning PHRM and Business Strategy

Concept of aligning Pharma business, brand and behavior of the Physicians, formulate and assess Pharma Business Strategies, Align efforts to Pharma business strategy for survival.

Unit 5: Pharmaceutical HR Competencies

Concept and types of HR Competencies, Competencies in PHRM, Role of PHRM in strategy formulation, HR content areas and the SHRM competencies for Pharma Business.

Prescribed Book:

1. Michael W. Noel, J. Lyle Bootman Aspen Systems Corporation, 1986 - Business & Economics.
2. A Textbook Of Pharmaceutical Industrial Management, Shah Elsevier India, 2010.

Suggested Readings:

1. Pharmaceutical Production and Management- C.V.S. Subrahmanyam.
2. Human Resource Management, 9th Ed, Pearson Education, Inc. Senyucel, Z. (2012).
3. Human Resource Management, 36(3), 357– 365; Pfeffer, J, 1994.

GBSRC MBA Syllabus

BIOTECH AND BIOINFORMATICS MANAGEMENT SPECIALIZATION

COURSE CODE	MB401F
COURSE TITLE	CASES IN MANAGEMENT (BIOTECH & BIOINFORMATICS)
COURSE CREDITS	3

Course Description:

The course aims to get the students thinking and discussing issues pertaining to management drawing on what they already know. To increase awareness and knowledge of contemporary management issues and to allow students the opportunity to discuss and critically analyse source materials, in order to both enhance their understanding of the topics and to practice their analytical and debating skills.

Course Objectives:

1. To give students the confidence and experience of debating issues on the managerial command.
2. To give exposure exposure of real life Business situation and decision making with the best possible use of resources.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
401F.1	Remembering	Describe the major concepts in biotechnology
401F.2	Understanding	Summarize the impact of current developments in biotechnology
401F.3	Applying	Make use of different techniques in biotechnology to answer the pressing needs
401F.4	Analysing	Attributing the cases with reference to technological developments
401F.5	Evaluating	Test the cases with reference to latest therapies and technologies
401F.6	Creating	Construct a case on any one biotech topics

Course Outline:

To facilitate student learning, a range of source materials will be used throughout the course to direct and stimulate discussion, course will be having five case studies from the contemporary topics of the specializations of management students which is to be discussed in the class room by respective subject faculty. Students are also encouraged to put forward their own ideas for sessions, and to contribute source materials where appropriate to increase engagement in, and relevance of, the course for students. Case analysis and presentations will be an integrate part of learning case studies.

CASES IN MANAGEMENT (BIOTECH & BIOINFORMATICS)

1. Five cases to be discussed analyzed and presented from the following topics.
2. Following are the suggested topics however are not limited and open for contemporary topics.
 1. Plant biotechnology
 2. Recent advances in biotechnology
 3. Stem cell technology
 4. Recombinant DNA techniques
 5. Cancer treatment using nanotechnology
 6. Signalling pathways
 7. Disease detection using robotics
 8. Gene therapy
 9. Environmental biotechnology
 10. Industrial biotechnology

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COURSE CODE	MB402F
COURSE TITLE	BIOTECHNOLOGY SOCIAL, LEGAL & ETHICAL ISSUES
COURSE CREDITS	3

Course Description:

This course examines biotechnology and genetic engineering in social, legal, and ethical contexts.

Course Objectives:

1. To gain familiarity with bioethical approaches and learn to apply them to the issues raised by biotech.
2. To make students learn about the social, Legal & ethical issues raised due to the rapid progress in Biotechnology and development of new products.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
402F.1	Remembering	Describe types of current trends in the treatment areas of various conditions
402F.2	Understanding	Explain social and cultural issues associated with different molecular technologies
402F.3	Applying	Demonstrate legal frameworks of various countries for the use of molecular technologies
402F.4	Analysing	Examine ethical issues associated with molecular technology treatments
402F.5	Evaluating	Determine the need of bioethics and National and international regulations for bioethics
402F.6	Creating	Design a system for ethical practices in Biotechnology

Course Outline:

Unit 1: Molecular technologies – an overview of Genetic screening for any predisposition symptoms, Cancer screening, Cloning, Gene therapy, DNA fingerprinting,(Paternity and Forensics) in vitro fertilization, surrogate motherhood, PGD, transgenic organisms, xenotransplantation, GMOs.

Unit 2: Social issues - public opinions against the molecular technologies.

Unit 3: Legal issues – legal actions taken by countries for use of the molecular technologies.

Unit 4: Ethical issues – ethical issues against the molecular technologies.

Unit 5: Bioethics – Necessity of Bioethics, different paradigms of Bioethics – National & International.

Prescribed Books:

1. Bioethics & Biosafety R Rallapalli & Geetha Bali APH Publication 2007.

2. Biotechnology and Safety Assessment Thomas J.A., Fuch R.L Academic Press 3rd Edition 2002.
3. IPR, Biosafety and Bioethics by Deepa Goel and Shomini Parashar, Pearson publisher.

Suggested Readings:

1. Biological safety Principles and practices Fleming D.A., Hunt D. ASM Press 3rd.ed. 2000.
2. Bioethics Ben Mephram Oxford University Press 2008.

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COURSE CODE	MB403F
COURSE TITLE	BIOTECH INDUSTRY & POST- PANDEMIC RESILIENCE MANAGEMENT
COURSE CREDITS	3

Course Description:

Disasters at work place and surroundings is common. This course enable students to understand how we can manage a disaster whether it is natural or man-made effectively. This course creates the awareness of institutional process in the country and develop basic ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity.

Course Objectives:

1. To provide student an exposure to disasters, their significance and types.
2. To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
403F.1	Remembering	Describe the definition and key concepts in disaster management
403F.2	Understanding	Discuss types of biological disaster management and its impact
403F.3	Applying	Demonstrate steps in disaster management and roles and responsibilities of community
403F.4	Analysing	Examine the impact of different factors on disaster management
403F.5	Evaluating	Evaluate the components of disaster relief and preparedness for potential disasters
403F.6	Creating	Choose the suitable steps in Disaster and Risk Reduction programme.

Course Outline:

Unit 1: Introduction to Disasters

Concepts and definitions Key components of disaster management (Disaster, Hazard, Vulnerability, Resilience, Risks).

Unit 2: Types of Disaster in Biotech Industry

Biological disaster management – disease epidemics, Impacts of disasters including social, Global trends in disasters urban disasters, pandemics, economic, political, complex emergencies, Climate Change environmental, health, psychosocial, etc.

Unit 3: Steps in Disaster Management

Culture of safety, prevention, mitigation and Risk reduction preparedness, community based DRR, Structural – nonstructural measures, roles and responsibilities of community, Resilience on the

front lines & Healthcare sector, Healthcare providers, Life sciences & Biotech- Pharma industry.

Unit 4: Inter-Relationship Factor Affecting

Vulnerabilities: differential impacts, between Disasters and impact of Development projects, Development embankments, changes in Land-use etc. Climate Change Adaptation. Relevance of indigenous knowledge, appropriate technology and local resources.

Unit 5: Disaster Risk in India Hazard and Vulnerability Profile of India

Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional Arrangements, Preparing for potential disasters. Role of biomedical engineering in disaster management, Long term impact of COVID 19.

Prescribed Books:

1. Alexander David, Introduction in “Confronting Catastrophe”, Oxford University Press, 2000.
2. Andharia J. Vulnerability in Disaster Discourse, JTCDM, Tata Institute of Social Science working Paper no. 8, 2008.
3. Blaikie, P, Cannon T, Davis I, Wisner B 1997, At Risk Natural Hazards, Peoples, Vulnerability and Disasters, Rutledge.
4. Disaster Management: - B. Narayan.
5. Disaster Management: - Ram Kumar and S. L. Goel.

Suggested Readings:

1. Coppola P Damon, 2007, Introduction to International Disaster Management.
2. Carter, Nick 1991, Disaster Management: A Disaster Manager’s Handbook, Asian Development Bank, Manila Philippines.
3. Cuny, F.1983, Development and Disasters, Oxford University Press.
4. Document on World Summit on Sustainable Development 2012.
5. Govt. of India: Disasters Management Act 2005. Government of India, New Delhi.
6. Government of India, 2009, National Disasters Management Policy.
7. Gupta Anil K, Sreeja S. Nair, 2011, Environmental Knowledge for Disasters Risk Management, NIDM, New Delhi.
8. Indian Journal of Social Work 2002, Special Issue on Psychosocial Aspects of Disasters, Vol. 63, Issue 2, April.

COURSE CODE	MB404F
COURSE TITLE	FERMENTATION TECHNOLOGY AND INDUSTRIAL BIOTECHNOLOGY
COURSE CREDITS	3

Course Description:

It seeks to provide education and training, empower students with technical skill-set, create capacities and build career opportunities in three key domains of biotechnology namely: Research and development, Science education and Policy, regulations and management.

The course aims to provide fundamental insights to exploit enzymes and microbes for the manufacturing of products which have a huge industrial significance. Strategies to obtain higher yields, design of the reactors and production of biofuels from microbes are thoroughly explained.

Course Objectives:

1. To introduce with the fundamentals of industrial Biotechnology.
2. To study industrial production of fermented products.
3. To study unit operations in food industry.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
404F.1	Remembering	The students will be able to FIND advanced skills in performing literature searches in undertaking an in-depth case study of an environmental issue, and presenting a critical appraisal.
404F.2	Understanding	The students will be able to INTERPRET the applications of various fields including chemistry, biochemistry, molecular biology and/or microbiology, in understanding and addressing the above issues, as well as exploring environmental resources for new technologies.
404F.3	Applying	The students will be able to IDENTIFY the various global and regional environmental concerns due to natural causes and/or human activities, and the impact of these on various forms of life including native biodiversity.
404F.4	Analysing	The students will be able to EXAMINE the various techniques of Sterilization
404F.5	Evaluating	The students will be able to DETERMINE the process of Isolation and preservation of industrially important microbes
404F.6	Creating	The students will be able to CREATE the various strains of microbes, bacterias for fermentation process.

Course Contents:

Unit 1: Introduction to ermentation technology

Historical background, Important industrial biotechnologically derived products.

Unit 2: Fermentation Design

Design of Fermenter and its components (construction, impellers, valves, spargers, other attachments of the system) -Layout of Fermenter unit and laboratory -Operation details of fermentation and troubleshooting -Bioreactor types for products of microbial, plant and animal origin -Role of computers in fermentation processes.

Unit 3: Sterilization

Sterilization of Fermenter (batch and continuous processes) -feed sterilization -sterilization of liquid wastes -Filter sterilization.

Unit 4: Isolation of microbes and Strain improvement

Isolation and preservation of industrially important microbes -Strain improvement by recombinant DNA techniques, isolation of mutants, etc.

Unit 5: Design of media and inoculums development

Nutritional media for microorganisms, their formulation, sterilization, screening and economy for proper growth of industrial microbes - identification of variables important for fermentation - Medium optimization using conventional and statistical designs - Inoculums development for bacterial, fungal and yeast strains -Aseptic inoculation in Fermenter.

Prescribed Books:

1. Fundamentals of Microbiology by Forbisher.
2. Food Biotechnology: Dietrich Knorr, Inc. New York and Basel.
3. Food Science: Potter N.N. CBS publication.
4. Food Science and Technology: B.S.Khattar, Daya Publishing House, Delhi.
5. Textbook of Biotechnology-H.K.Das.
6. Textbook of Biotechnology-Purohit.

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COURSE CODE	MB405F
COURSE TITLE	ADVANCES IN BIOTECHNOLOGY AND BIOINFORMATICS
COURSE CREDITS	3

Course Description:

It seeks to provide education and training, empower students with technical skill-set, create capacities and build career opportunities in three key domains of biotechnology namely: Research and development, Science education and Policy, regulations and management.

Course Objectives:

1. To introduce students with various databases.
2. To study Pairwise and Multiple sequence alignments.
3. To study Phylogenetic analysis.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
405F.1	Remembering	The students will be able to IDENTIFY various databases and bioinformatics tools available.
405F.2	Understanding	The students will be able to ILLUSTRATE the important applications of the growing biotechnology fields of veterinary biotech, dental biotech, nanotechnology, bioterrorism, and biodefense.
405F.3	Applying	The students will be able to CHOOSE various molecular sequences
405F.4	Analysing	The students will be able to CLASSIFY various scoring matrices
405F.5	Evaluating	The students will be able to COMPARE various Methods of construction of Phylogenetic trees
405F.6	Creating	The students will be able to DEVELOP Pairwise and Multiple sequence alignments and Phylogenetic analysis.

Course Contents:

Unit 1: Introduction to Nanobiotechnology and Biosensors

History of Nanobiotechnology, Growth of Nanotechnology and development of Nanobiotechnology, Introduction to biosensors -History of discovery of biosensors -Components of a typical biosensor.

Unit 2: Genomics, Transcriptomics and Proteomics

Introduction to genomics, Transcriptomics and proteomics. Application of genomics, Transcriptomics and proteomics in agriculture, medicine and industry.

Introduction and current status of Biopharmaceuticals in the pharmaceutical industry Nucleic acid therapeutics, Hormones of therapeutical interest, Antibodies, vaccines and adjuvants.

Unit 3: Nucleic acid sequence databases

GenBank, EMBL, DDBJ • Protein sequence databases, SWISS-PROT, TrEMBL, PIR, PDB • Genome Databases at NCBI, EBI, TIGR, SANGER • Other Databases of Patterns/Motifs/System

Biology (Gene and protein network database and resources) Sequence analysis: • Various file formats for bio-molecular sequences: genbank, fasta, gcg, msf, nbrf-pir etc. • Basic concepts of sequence similarity, identity and homology, definitions of homologues, orthologues, paralogues

Unit 4: Scoring matrices: basic concept of a scoring matrix, PAM and BLOSUM series, Sequence-based Database Searches: what are sequence-based database searches, BLAST and FASTA algorithms, various versions of basic BLAST and FASTA, Pairwise and Multiple sequence alignments: basic concepts of sequence alignment, Needleman and Wuncsh, Smith and Waterman algorithms for pairwise alignments, Progressive and hierarchical algorithms for MSA. Use of pairwise alignments and Multiple sequence alignment for analysis of Nucleic acid and protein sequences and interpretation of results.

Unit 5: Phylogeny

Phylogenetic analysis, Definition and description of phylogenetic trees and various types of trees, Method of construction of Phylogenetic trees [distance based method (UPGMA, NJ), Maximum Parsimony and Maximum Likelihood method] Current Advancements in Bioinformatics: Introduction to System Biology, Structural Biology, Structural bioinformatics, Chemo informatics, Immunoinformatics etc.

Prescribed Books:

1. Introduction to Bioinformatics by Aurther Mlesk.
2. Developing Bioinformatics Computer Skills By: Cynthia Gibas, PerJambeck.

GBSRC MBA Syllabus

COURSE CODE	MB406F
COURSE TITLE	AGRICULTURAL BIOTECHNOLOGY
COURSE CREDITS	3

Course Description:

A course designed to incorporate basic elements of science with a variety of technology applications that are used to modify living organisms. Areas of emphasis include basic science laboratory procedures, implementation of the scientific method of discovery, plant science, animal science, environmental science and food science.

Course Objectives:

1. To introduce students with Agricultural Biotechnology.
2. To study the plant and animal Biotechnology advancements.
3. To advance education and research in Biotechnology and explore sustainable solutions for agriculture, environment and energy sectors.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
406F.1	Analyzing	The students will be able to ANALYZE different methods of Crop Improvement.
406F.2	Understanding	The students will be able to INTERPRET the advantages of genetically modified plants and animals.
406F.3	Applying	The students will be able to DEMONSTRATE Gene transformation techniques in Plant Biotechnology.
406F.4	Evaluating	The students will be able to EXAMINE the application of plant and microbial biotechnologies for sustainable agriculture.
406F.5	Understanding	The students will be able to ASSESS how modern agricultural biotechnology and genetic resources can be harnessed to achieve environmental sustainability.
406F.6	Applying	The students will be able to ADAPT knowledge about the range of approaches to manipulate and improve plants, animals and microorganisms.

Course Contents:

Unit 1: Introduction to Agricultural biotechnology, Scope of agro biotechnology, Transgenic Plants-resistance to viral diseases, Biotechnology for commercial crops, Maize, Rice, Cotton, Potato, Tomato, Sugarcane. Techniques used in Plant biotechnology.

Unit 2: Plant Biotechnology- Methods of Crop Improvement, Gene transformation techniques in Plant Biotechnology: Agro-bacterium mediated gene transformation and Gene gun method, Bt genes and its applications.

Unit 3: Disease resistant plants, Resistance to biotic stress, Herbicide resistance in plants The Indian force of Agricultural biotechnology.

Unit 4: Introduction to marine Biotechnology, Biotechnology in Aquaculture, Improvement in grain and tuber quality, Agriculture and genetic engineering, Agricultural diagnosis.

Application of Plant diagnostics.

Unit 5: Transgenic plants as bioreactors, Production of antibodies and primary metabolites by plants, Biotechnology for the production of secondary metabolites.

Animal livestock breeding, Importance of livestock in agriculture, relationship between plant and animal husbandry, animal breeding, breeds of indigenous and exotic cattle, buffaloes, goats, sheep, pigs and poultry and their potential for milk, egg, meat and wool production, classification of feed and fodder, major contagious diseases affecting cattle and drought animals, poultry and pigs, Sericulture and its applications Biotechnology in Agriculture, Ethical Aspects and Public Acceptance.

Prescribed Books:

1. Biotechnology by B. D. Singh, Kalyani Publication.
2. Biotechnology – Fundamentals and applications by S. S. Purohit.
3. Student Edition Agricultural Biotechnology-Arie Altman, CRC Press.
4. Biotechnology- An Introduction by Susan R. Barnum, Vikas Publishing House.
5. Aqua Culture – An Introduction, Lee and Newman, Interstate Publishers.

GBS RC MBA Syllabus

COURSE CODE	MB407F
COURSE TITLE	BIOTECHNOLOGY AND PHARMA PLANT MANAGEMENT
COURSE CREDITS	3

Course Description:

This course is designed to impart knowledge and skills necessary to train the students to be on scale up, biopharma manufacturing process, operational structure of biopharma industry. To update them about Bio suppliers & services market and industrial safety issues. Which increases the knowledge regarding the regulatory aspects in the bio pharmaceutical industries. The topics which are present in the course are very much useful to the students in personality development become perfect biopharma professional.

Course Objectives:

1. To Manage the scale up process in biopharmaceutical industry.
2. To Assist in entire management of biopharma plants (industry).
3. To establish safety guidelines, which prevent industrial hazards.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
407F.1	Remembering	DEFINE various concepts in biotechnology manufacturing
407F.2	Understanding	EXPLAIN various concepts in pharma manufacturing and role of different entities
407F.3	Applying	IDENTIFY different biopharma facilities, CRO facilities etc
407F.4	Analysing	Evaluating different government initiatives and consultancies to set up the facilities
407F.5	Evaluating	DISTINGUISH different types of hazards associated with Pharma and biotech industry
407F.6	Creating	DEVELOP strategy for environmental awareness

Course Outline:

Unit 1: Biotechnology Manufacturing

Automation, process control and information solutions for biotech industry, Modern DCS for Visibility and up time, CM (Continuous Manufacturing), fully integrated control systems. Bio suppliers in biotech & pharma industry, quality measures.

Unit 2: Pharmaceutical Manufacturing

Production and Process- Information and tools need to design, implement, operate and troubleshoot pharma manufacturing. Role of Scientists, Managers and engineers in pharmaceutical/ biotech Plant management.

Unit 3: Study of Biopharma Facilities, CGMP- Concept & definition, Production, R& D requirements in biopharma industry, Pharmaceutical biocontainment labs, levels of BSL, Bio services involved in Contract Research and clinical trials, processes and guidelines followed by CROs.

Unit 4: Current Status of Biotech Pharma Industry, Plant management in India and abroad, List of companies or organizations provide a ready-made facility for biotech & pharma industries, Role

of companies and consultancy about facility/ plant management, Packaging and Labelling facilities, government initiatives to support biotech industry to set up Innovation Parks/Biotech Centres.

Unit 5: Industrial safety

Hazards – fire, mechanical, electrical, chemical and biopharmaceutical, Monitoring & prevention systems, industrial effluent testing & treatment. Control of environmental pollution. Government rules and norms for the maintains and disposal (waste) from the biopharma labs. Emerging trends in the biotech & pharma sector.

Prescribed Books:

1. Managing Biotechnology, from Science to Market in Digital Age, Simon Francoise, Wiley.
2. Subrahmanyam, CVS, Pharmaceutical Production and Management, 2007, Vallabh Prakashan, Delhi.
3. A Biotech Manager's Handbook, Woodhead Publishing Ltd, eBook by O'Neill, M, Hopkins, M M.

Suggested Readings:

1. The theory & Practice of Industrial Pharmacy, L. Lachman, H.A. Lieberman, Varghese Publ. Bombay.
2. Pharmaceutical Production facilities, design and applications, by GC Cole, Taylor and Francis.
3. Pharmaceutical Project management, T. Kennedy, Vol 86, Marcel Dekker, NY.
4. Handbook of Pharmaceutical manufacturing formulations: Sterile product by Sarfaraz K Niazi.
5. Pharma manufacturing handbook production and processes by Shayne Cox Gad, Wiley interscience.

GBSRC MBBS Syllabus

INFORMATION TECHNOLOGY AND SYSTEMS MANAGEMENT SPECIALIZATION

COURSE CODE	MB401G
COURSE TITLE	CASES IN MANAGEMENT (IT & SYSTEMS MANAGEMENT)
COURSE CREDITS	3

Course Description:

The course aims to get the students thinking and discussing issues pertaining to management drawing on what they already know. To increase awareness and knowledge of contemporary management issues and to allow students the opportunity to discuss and critically analyse source materials, in order to both enhance their understanding of the topics and to practice their analytical and debating skills.

Course Objectives:

1. To give students the confidence and experience of debating issues on the managerial command.
2. To give exposure exposure of real life Business situation and decision making with the best possible use of resources.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
401G.1	Remember	DEFINE the major IT Technologies & systems contributing to management field in efficient management of resources.
401G.2	Understand	DISCUSS the impact of new IT Technologies that enhance the functioning of management.
401G.3	Apply	MAKE USE OF the Theories, Models, Principles and Frameworks of Information technology in analysing the cases of IT.
401G.4	Analyze	EXAMINE Cases of IT interms of finding a IT solution to various management problems
401G.5	Evaluate	CRITIQUE various business cases releted to IT solutions to Management.
401G.6	Create	DESIGN a Sample Case on any industry where IT technology and Systems are solving Challenging Management Problems.

Course Outline:

To facilitate student learning, a range of source materials will be used throughout the course to direct and stimulate discussion, course will be having five case studies from the contemporary topics of the specializations of management students which is to be discussed in the class room by respective subject faculty. Students are also encouraged to put forward their own ideas for sessions,

and to contribute source materials where appropriate to increase engagement in, and relevance of, the course for students. Case analysis and presentations will be an integrate part of learning case studies.

CASES IN MANAGEMENT (IT & SYSTEMES MANAGEMENT)

1. Five cases to be discussed analyzed and presented from the following topics.
2. Following are the suggested topics however are not limited and open for contemporary topics.
 1. IOT enabled management
 2. Information Communication Technology
 3. Cloud Computing
 4. Artificial Intelligence
 5. Remote Sensing
 6. Cellular Gateways
 7. Big Data
 8. Global Networking
 9. Online content measurement
 10. Backup and disaster recovery

GBSRC MBA Syllabus

COURSE CODE	MB402G
COURSE TITLE	E-GOVERNANCE AND FRAMEWORK OF ICT
COURSE CREDITS	3

Course Description:

This course will introduce you to the ways in which internet technologies are affecting how people interact with government, and how governments, in turn, are using and managing these technologies to better provide information and services to the public. Course content is divided into three main themes, and begins with an overview of development techniques and assessment methods for public web sites and on-line applications.

Course Objectives:

1. Gain a familiarity with the basic concepts, terminology and technology of e-commerce/e-government.
2. Develop skills to critically evaluate government web sites and eservices against current “best practice” principles and standards.
3. Understand the major federal and state laws and regulations impacting the evolution of e-government.
4. Be able to articulate the policy and social issues facing agencies in implementing e-government initiatives.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom’s Level	Course Outcomes
402G.1	Remember	DEFINE the basic terms, concepts, and frameworks of use of ICT in E-Governance.
402G.2	Understand	EXPLAIN the various models of E-Governance & its use in various sectors.
402G.3	Apply	EXECUTE the policies given by authorities using the tools of ICT.
402G.4	Analyze	EXAMINE the usage of various E-Governance models such as Critical Flow Model, Interactive Service Model etc.
402G.5	Evaluate	APPRAISE the efforts taken by the Government in order to to encourage citizen participation in E-Governance.
402G.6	Create	INVESTIGATE the extent of citizen participation in e-Democracy with the help of ICT tools.

Course Outline:

Unit 1: Overview of E-Government and E-Governance

Stages of E-Governance, National EGovernance Plan(NeGP), Mission Mode Projects and their implementation status, E-Governance Introduction to E-governance, Role of ICT in e-governance, Need, importance of E-governance, Categories of E-governance, Key Issues of E-Governance,

Technology, Policies, Infrastructure, Training, Copyrights , Consulting Funds, E-governance Models, Model of Digital Governance, Wider Dissemination Model.

Unit 2: E governance Models

Critical Flow Model, Interactive-service model/Government to-Citizen-to-Government Model (G2C2G), Major areas of E-governance Services, Public Grievances: Telephone, Ration card, transportation, Rural services Land Records, Police: FIR registration, Lost and found, Social services: Death, domicile, school certificates, Public information: employment, hospitals, railway, Agricultural sector: Fertilizers, Seeds, Utility payments Electricity, water, telephone, Commercial: income tax, custom duty, excise duty-Governance Infrastructure.

Unit 3: Phases of e-government

“Brochure ware”, Interactive, and Transaction, Five Stages of Electronic Government Development, Statutes affecting e-government development, Human Infrastructural preparedness, Challenges for E-governance.

Unit 4: Policies

National Telecom Reforms, National Telecom Policies NTPs, Regulations: Digital Divide and Digital Dividends, Development and rationale of regulation and, deregulation, Role of Telecom Regulatory Agencies - Telecom Regulatory Authority of India (TRAI) & ITU, Information Technology Act (2000), Internet and E-commerce issues: privacy, security, domain names, etc, Wireless: frequency auctions, standards, competition.

Unit 5: Public Access & Government Transparency

e-Democracy and On-line Activism Government efforts to encourage citizen participation Blogging and internet campaigns.

Prescribed Books:

1. Heather E Hudson, (2006). Global Connections - International Telecommunications Infrastructure and Policy, 1st Edition, Wiley Publication.
2. E. Bohlin and S.L. Levin, (2000). Telecommunications Transformation - Technology, Strategy and Policy, 1st Edition, IOS Press.
3. McElroy, (2003). KMCI (Knowledge Management Consortium International) and Butterworth Hienemann, 1st Edition.
4. R. K. Mitra, (2006). E-government: Macro Issues, 1st Edition, GIFT Publishing.

Suggested Readings:

1. Vikram Raghavan, (2007). Communication Law in India-Legal Aspects of Telecom, Broadcasting, and Cable Services, 1st Edition, Lexis Nexis Butterworths.
2. D N Gupta, (2008). E Governance A Comprehensive Framework, 1st Edition, Jain Publications.

COURSE CODE	MB403G
COURSE TITLE	E-LEARNING TOOLS & METHODS
COURSE CREDITS	3

Course Description:

To understand about eLearning is a learning process with the combination of content that is both delivered digitally and through face-to-face learning. ELearning contributes to the shifts from traditional face-to-face learning to the use of web technological tools which enhances collaborative learning and presents an entirely new learning platform for students

Course Objectives:

1. To understand e-learning as an emerging educational technology.
2. To learn use of tools/ technologies used for e-learning based pedagogy.
3. To develop capability to initiate e-learning project(s).

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
403G.1	Remember	STATE various key concepts, models in E-learning & its Implementation.
403G.2	Understand	IDENTIFY various types of e-learning tools and techniques.
403G.3	Apply	MAKE USE OF various Hardware & software tools of effective e-learning.
403G.4	Analyze	EXAMINE the usage of E-learning by using different tools of digital media such as LMS, LCMS etc.
403G.5	Evaluate	APPRAISE the role of various tools and techniques used in the effective implementation of E-learning.
403G.6	Create	DESIGN standardized content for e-learning using various tools of ICT.

Course Outline:

Unit 1: Introduction

e-learning- definition. Why e-learning? Elements of e- learning, eLearning content- dimensions, Risks in e-learning, ROI, e- learning cycles, Implementation.

Unit 2: Types of e-learning and technologies required

Students- led e-learning Facilitated e-learning, Instructor- led e-learning, Embedded e-learning Tele-mentoring and e-coaching, Categories of software tools.

Unit 3: Hardware and Networks for e-learning

Selection of e-learning Hardware, network for e- learning, types of networks, private network, private networks, internet, TCP/IP, wireless internet connection.

Unit 4: Tools for accessing e-learning

Web browsers, media players and viewers Tools for offering e- learning:Web servers, LMS- Learning Management Systems, Learning Content Management Systems, Collaboration tools, Virtual- School systems, media servers Tools for creating e- learning content:Course authoring tools, web site authoring tools, how they work?, an overview of popular web site authoring tools, alternatives to web authoring tools, blogging tools, testing and assessment tools.

Unit 5: Standards For e-learning

Standards for packaging, communication, Metadata, Quality standards , other standards and regulation Trends in e-Learning:Always Online, All information online, All Media digital, Emergence of HDTV video standard, Force or haptic feedback, Telepresence, immersive simulations, embedded system.

Prescribed Books:

1. Delivering E- learning : A complete strategy for design, application and assessment – by Kenneth Fee, Kogan Page London and Philadelphia, 2009.
2. E- Learning Tools and Technologies consumer’s guide for trainers, teachers, educators and instructional designers – William Horton, Katherine Horton, Wiley.

Suggested Readings:

Journal of e-Learning and Knowledge Society.

GBSRC MBA Syllabus

COURSE CODE	MB404G
COURSE TITLE	INNOVATION AND TECHNOLOGY MANAGEMENT
COURSE CREDITS	3

Course Description :

In this modern era of high competition and fast changes, –Innovation and Technology Management is assuming ever increasing importance in shaping the progress and future of the nations and business firms. The technological change is continuously occurring and affecting all aspects of life. It is bringing new opportunities and new threats. This course is designed for management students which signify the importance for the entrepreneurs and managers, both present and future. This course largely meets the requirements of MBA program.

Course Objectives:

1. To study the management of Technology.
2. To understand the use of technology for survival and growth.
3. To study the innovation at all level.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
404G.1	Remember	STATE various concepts and models used in innovation and technology management.
404G.2	Understand	RECOGNIZE various theories of innovation and technology and explain with examples the types of innovation.
404G.3	Apply	MAKE USE OF the processes and various theories of Innovation and Technology Management.
404G.4	Analyze	EXAMINE the business models, level of innovation and technology, success, and failure of today's start-ups.
404G.5	Evaluate	JUSTIFY the ethical and environmental ramifications of technological advancements, and factor them into your proposed solutions.
404G.6	Create	DEVELOP a list of potential innovation needs for India in the local, regional, and national contexts, and assess the likelihood of developing a business model to meet these needs in the present local, regional, and national contexts.

Course Contents:

Unit 1: Technology in Management

Technology for survival and growth, Science and technology, Types of technology, Technology portfolio, Technology lifecycle, Management of technology, Technology forecasting, Technology generation, Technology development.

Unit 2: Innovation

Goals and reasons, Difference between invention and innovation, Sources and advantages, Associated risks, Characteristics and types, Process, Failures, Innovation, Management

of Innovation.

Unit 3: Technology and its Concepts

Technology Transfer, Technology acquisition, Technology Absorption, Technology Diffusion, Technology Maturity, Technology Obsolescence, Technology Discontinuities, Technology Assessment, Technology Audit, Impact of Technological Change/Progress.

Unit 4: Information Technology

IT and the World, IT and the Government, IT and Industry, IT and India, IT and Career Management, Internet, Intranet and Extranet.

Unit 5: Organizational Change Management

Organizational change, Types and reasons, Change Management- Strategies, Process, Role of Leader in Facilitating Change, Technological Change, Change in Product and Process Design, Time Frame of Change, Managing Transformation.

Prescribed Books:

1. Twiss, Brain and Good Ridge, Managing Technology for Competitive Advantage.
2. Hawthorne, Edward, Management of technology.
3. Burgelman Robert A., Strategic Management of Technology and Innovation.
4. Jain Ashok ET. al. Indicators of Indian Science and Technology.

GBSRC MBA Syllabus

COURSE CODE	MB405G
COURSE TITLE	MARKETING OF INFORMATION TECHNOLOGY
COURSE CREDITS	3

Course Description:

The success of a product or service depends as much on its marketing strategies. And successful marketing rests on a scientific approach to the entire technology cycle, innovation, and domain knowledge of the marketing personnel. Since information technology industry changes faster than any other industry, vendors and marketers need to stay abreast of the latest trends in technological development and newer means of delivering IT services.

Course Objectives:

1. To understand the crucial role of IT on each of the components of the marketing mix.
2. To discover the need of new professional profile best adapted to the new IT/Mkt departments needs.
3. To gain strategic criteria and knowledge for comparing, evaluating, selecting, and contracting such technologies and services under different exploitation models.
4. To know real cases using ITM in innovative ways.
5. To be able to develop a practical strategic ITM plan.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
405G.1	Remember	STATE various concepts and models of Marketing of Information Technology.
405G.2	Understand	EXPLAIN the concepts and role of promotion in Marketing of IT products and services.
405G.3	Apply	MAKE USE OF understanding of the Concept of Cloud based advertisement of IT Products.
405G.4	Analyze	EXAMINE various factors considered while setting pricing of software products.
405G.5	Evaluate	APPRAISE the impact of social and digital networks and manage them effectively.
405G.6	Create	DEVELOP a marketing plan for the promotion an IT product.

Course Contents:

Unit 1: Global and Indian Software Industry Environment

Historical Growth of the Industry, Market Size, Nature of Products, Projects and Services, Major Players, Industry Associations and their role in market development, Overview of India's Software Export Industry. Concept of Cloud based advertisement- Product delivery and Maintenance, Mobility and alliances for marketing of IT.

Unit 2: Services Marketing Mix

7 Ps of Services Marketing – Service Life Cycle Strategic Aspects of Software Marketing - Identification of potential markets, Industry/ Business analysis and creating/ sustaining competitive advantage - Segmenting, Targeting and Positioning, IT Consulting.

Unit 3: Promotion

Role of Promotion in Software Marketing; Personnel Selling, Advertising and Sales Promotion; Trade Shows, Role of Relationship Marketing in promoting software. Web based advertisement. Google's content based advertisement.

Unit 4: Distribution

Place – Distribution Strategies for Software Products / Services; Challenges in distribution of Software Products and Services; Role of Internet in distribution of Software Products and Services. Smart phone application. Social media advertisement.

Unit 5: Pricing: Factors involved in pricing software Products, Price estimating for Software Projects.

Customer Satisfaction and Service Quality

Monitoring and measuring customer satisfaction. Applying technology to service settings, e-services. Role of People, Process and Physical Evidence in Software Products and Services. Online feedback and Maintenance. Use of Facebook, Twitter and Call centre for feedback, Managing Digital Platforms.

Suggested Readings :

1. Services Marketing - Zeithaml, Bitner, Gremler and Pandit, TMGH, 4Edition.
2. Service Marketing : Concepts, Applications And Cases – Rampal and Gupta, Galgotia, 2000
3. Saxena Rajan MM, (1997), Services Marketing, Tata McGraw Hill, New Delhi.
4. Edward Hasted; Software That Sells: A Practical Guide to Developing and Marketing your; John Wiley and Sons (2005); ISBN 10: 0764597833 ISBN 13:9780764597831.
5. Influence of Social Media on Social Services: A Study of Youngistan Piyush Kant Pyasi, Nitin Kr. Saxena, PranayKarnik.

COURSE CODE	MB406G
COURSE TITLE	KNOWLEDGE MANAGEMENT SYSTEM
COURSE CREDITS	3

Course Description:

The goal of this course is to give a solid foundation covering the major problems, challenges, concepts, and techniques dealing with the organization and management of knowledge with the help of computers.

Course Objectives:

1. To understand the fundamental concepts in the study of knowledge and its creation, acquisition, representation, dissemination, use and re-use, and management.
2. To appreciate the role and use of knowledge in organizations and institutions, and the typical obstacles that KM aims to overcome.
3. To understand how to apply and integrate appropriate components and functions of various knowledge management systems.
4. To be prepared for further study in knowledge generation, engineering, and transfer, and in the representation, organization, and exchange of knowledge.
5. To critically evaluate current trends in knowledge management and their manifestation in business and industry.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
406G.1	Remember	STATE various concepts, models and theories used in Knowledge Management.
406G.2	Understand	EXPLAIN Categories of Information and Knowledge based Systems for utilizing human expertise.
406G.3	Apply	INTERPRET the impact of KM solutions on People, Processes, products & Organizational Performance.
406G.4	Analyze	ORGANISE the Knowledge Discovery Systems that help organizations create knowledge.
406G.5	Evaluate	APPRAISE Systems that Capture Knowledge in different organizations.
406G.6	Create	INVESTIGATE Systems that share Knowledge in organizations.

Course Contents:

Unit 1: Knowledge Management Overview, Nature of Knowledge, Knowledge Management Solutions, Organizational Impacts of Knowledge Management, Strategic Management of IT.

Unit 2: Knowledge Education, Explicit and Implicit Knowledge, Discovering New Knowledge, Data Mining, Knowledge based Systems for utilizing human expertise.

Unit 3: Knowledge Discovery Systems that Create Knowledge.

Unit 4: Knowledge Capture Systems

Systems that Preserve and Formalize Knowledge; Concept Maps, Process Modeling, RSS, Wikis,

Delphi Method, etc.

Unit 5: Knowledge Sharing Systems

Systems that Organize and Distribute Knowledge; Ontology Development Systems, Categorization and Classification Tools, XML-Based Tools, etc.

Knowledge Application Systems: Systems that Utilize Knowledge.

Suggested Readings :

1. Irma Becerra-Fernandez, Avelino Gonzalez, Rajiv Sabherwal (2004). Knowledge Management Challenges, Solutions, and Technologies (edition with accompanying CD). PrenticeHall.
2. Elias M. Awad, Hassan M. Ghaziri (2004). Knowledge Management. Prentice Hall
Ian Watson (2002). Applying Knowledge Management: Techniques for Building Corporate Memories. Morgan Kaufmann.
Madanmohan Rao (2004). Knowledge Management Tools and Techniques: Practitioners and Experts Evaluate KM Solutions. Butterworth-Heinemann.
3. Amrit Tiwana (2002). The Knowledge Management Toolkit: Orchestrating IT, Strategy, and Knowledge Platforms (2nd Edition). Prentice Hall.

GBSRC MBA Syllabus

COURSE CODE	MB407G
COURSE TITLE	ENTERPRISE RESOURCE PLANNING
COURSE CREDITS	3

Course Description:

Automation and technology is changing the way business operates. Importance of Computer software's and IT support is increasing in every sector of the industry. Organizations like manufacturing, banks, insurance firms, government agencies extensively use computerized analysis in their decision-making. Companies are developing distributed systems that permit uncomplicated accessibility to data saved in several locations. Managers can make better decisions because they have access to more accurate information. The course brings in the essentials of the ERP environment, which is accepted as the crucial platform to recognize the business processes upon which the support systems are built.

Course Objectives:

1. To gain knowledge of the comprehensiveness of ERP Implementation as a strategic initiative of business.
2. To learn and recognize the significance of ERP in today's business context.
3. To know the use of ERP into core business processes and as an enabler for extending its scope to back and forth the supply chain for organizations.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
407G.1	Remember	STATE various terms, concepts and models used in Enterprise Resource Planning.
407G.2	Understand	EXPLAIN ERP tools, softwares, ERP selection methods & criteria.
407G.3	Apply	MAKE USE OF Business Process Reengineering, Management Information System & Decision Support System.
407G.4	Analyze	EXAMINE various ERP related technologies and their effectiveness.
407G.5	Evaluate	APPRAISE the use of various models such as HR model, Finance Model, Materials Management Model etc.
407G.6	Create	DESIGN policies for effective ERP system implementation.

Course Outline:

Unit 1: Introduction to ERP

Information System: Components of an information system; Different types of information systems; Management information system, Enterprise Resource Planning: Business modeling; integrated data model, importance of Information: Characteristics of information; Types of information, Defining ERP, Origin and Need for an ERP System, Benefits of an ERP System, Reasons for the Growth of ERP Market, Reasons for the Failure of ERP Implementation: Roadmap for successful ERP implementation.

Unit 2: ERP Implementation Life Cycle

ERP Tools and Software, ERP Selection Methods and Criteria, ERP Selection Process, ERP Vendor Selection, ERP Implementation Lifecycle, Pros and cons of ERP implementation, Factors for the Success of an ERP Implementation.

Unit 3: ERP and Related Technologies: Business Process Re-engineering, Management Information systems, Decision Support Systems, Executive Information Systems- Advantages of EIS; Disadvantages of EIS, Data Warehousing, Data Mining, On-Line Analytical Processing, Product Life Cycle Management, Supply Chain Management, ERP Security, Role of ERP in Manufacturing, Purchasing, Sales and Distribution, CRM, Inventory, HR, Finance.

Unit 4: ERP OPERATION AND MAINTENANCE: Operation and Maintenance, Performance, Maximizing the ERP System, Business Modules, Finance, Manufacturing, Human Resources, Plant maintenance, Materials Management, Quality management, Marketing – Sales, Distribution and service.

Unit 5: ERP IN ACTION: ERP MARKET: Marketplace, Dynamics, SAP AG – Oracle – PeopleSoft – JD Edwards – QAD Inc – SSA Global – Lawson Software. Enterprise Application Integration – ERP and E-Business – ERP II – Total quality management – Future Directions – Trends in ERP.

Prescribed Books :

1. Alexis Leon, “ERP DEMYSTIFIED”, Tata McGraw Hill, Second Edition, 2008.
2. Mary Sumner, “Enterprise Resource Planning”, Pearson Education, 2007.
3. Textbook of Enterprise Resource Planning by Mahadeo Jaiswal & Ganesh Vanapalli, Macmillan.

Suggested Readings:

1. Enterprise Resource Planning – Concepts and Practices by Vinod Kumar Garg & N K Venkatakrishna, PHI.
2. Enterprise Resource Planning, Ellen F. Monk, Bret J. Wagner, Cengage Learning, First Indian Reprint 2009.
3. Enterprise Resource Planning, Mary Sumner, Pearson Education, Fourth Impression 2009.

INTERNATIONAL BUSINESS MANAGEMENT SPECIALIZATION

COURSE CODE	MB401H
COURSE TITLE	CASES IN MANAGEMENT (INTERNATIONAL BUSINESS MANAGEMENT)
COURSE CREDITS	3

Course Description:

The course aims to get the students thinking and discussing issues pertaining to management drawing on what they already know. To increase awareness and knowledge of contemporary management issues and to allow students the opportunity to discuss and critically analyse source materials, in order to both enhance their understanding of the topics and to practice their analytical and debating skills.

Course Objectives:

1. To give students the confidence and experience of debating issues on the managerial command.
2. To give exposure exposure of real life Business situation and decision making with the best possible use of resources.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
401H.1	Remember	DEFINE the basic concepts and legal terminologies used in International Business.
401H.2	Understand	DESCRIBE the INCO Terms and its Applicability to International Carriage.
401H.3	Apply	INTERPRET various IP laws and Licensing agreements.
401H.4	Analyze	DIFFERENTIATE between the laws of India with the international laws with respect to various aspects of International Business.
401H.5	Evaluate	APPRAISE the legal framework related to Currency, Insurance, Trade laws and IPR in international environment.
401H.6	Create	INVESTIGATE various issues related to International business with the help of facts provided in the case study.

Course Outline:

To facilitate student learning, a range of source materials will be used throughout the course to direct and stimulate discussion, course will be having five case studies from the contemporary topics of the specializations of management students which is to be discussed in the class room by respective subject faculty. Students are also encouraged to put forward their own ideas for sessions, and to contribute source materials where appropriate to increase engagement in, and relevance of, the course for students. Case analysis and presentations will be an integrate part of learning case studies.

CASES IN MANAGEMENT (INTERNATIONAL BUSINESS MANAGEMENT)

1. Five cases to be discussed analyzed and presented from the following topics.
2. Following are the suggested topics however are not limited and open for contemporary topics.
 1. WTO. A global trade regulator.
 2. Anti dumping measures as a tool of Protectionism..... International economic
 3. Pricing exim inco terms
 4. Port based SEZ
 5. Exporting challenge in a small firm
 6. International Marketing
 7. International Business Strategy
 8. Trade secret. IPR
 9. Trademark registration
 10. PESTLE Analysis

GBSARC MBA Syllabus

COURSE CODE	MB402H
COURSE TITLE	LEGAL FRAMEWORK FOR INTERNATIONAL BUSINESS
COURSE CREDITS	3

Course Description:

This course covers an introduction to International Law and comparison of different legal systems; State responsibility, including protection of the environment; International dispute resolution; The Multinational Enterprise, their structures and home State regulation, including regulation of anti-competitive conduct and sharp business practices such as bribery; Intellectual Property including trademarks, invention patents, product designs, copyright and confidential information/trade secrets. Other topics covered are Foreign Investment, International Trade in Goods, Contracts for International Sales of Goods, Transportation of Goods, Financing and Taxation.

Course Objectives:

1. To understand Global Legal Environment.
2. To know characteristics of international business scenario
3. To develop positive attitude towards international business Laws.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
402H.1	Remember	DEFINE the basic concepts and legal terminologies used in International Business
402H.2	Understand	DESCRIBE the INCO Terms and its Applicability to International Carriage
402H.3	Apply	INTERPRET various IP laws and Licensing agreements.
402H.4	Analyze	DIFFERENTIATE between the laws of India with the international laws with respect to various aspects of International Business.
402H.5	Evaluate	APPRAISE the legal framework related to Currency, Insurance, Trade laws and IPR in international environment.
402H.6	Create	INVESTIGATE various issues related to International business with the help of facts provided in the case study.

Course Outline:

Unit 1: Legal Framework of International Business

Nature and Complexities; Code and Common Law and their implications to business; International Business Contracts- Legal Provision, Payment terms; International Sales Agreement; Rights and Duties of Agents and Distributors; The Regulation of Imports and Exports; Comparative Law: Differences in National Laws and Legal Systems; Formation and Performance of Contract, Acceptance and Rejection of Goods. Company Law: Characteristics of Company, Kinds and tages in the formation of a Company; setting up offices and branches abroad.

Unit 2: International Commercial Terms (INCOTERMS)

Carriage Unimodel and Multimodel Transport; The Carriage of Goods and the Liability of International Air Carriers, The Warsaw Convention of 1929, The Montreal Convention of 1999, Applicability to International Carriage, Liability for Air Cargo Losses; Liability of the Goods by Sea, The Harter Act, The Hague Rules, the Carriage of Goods by Sea Act (COGSA), Limitations of Liability under COGSA, Nautical Liability of the Carrier; Shipper's Liability for Hazardous Cargo; Carrier's Liability for Cargo Shortages, The Per Package Limitation; Liability for Material Deviation; Liability of Ocean Transportation Intermediaries.

Unit 3: Licensing Agreements and the Protection of Intellectual Property Rights

Reasons for Intellectual Property Transfer Agreements; Intellectual Protection for Patents, Trademarks and Other Intellectual Property, Trade Related Aspects of Intellectual Property Rights (TRIPS), the DOHA Declaration on TRIPS and Public Health; Non Enforcement of IPR Laws; The Mechanics of IPR Transfer Regulations; The Gray Market; Franchising: Licensing outside the Technological Context.

Unit 4: Host Country Regulations

Corporate Law, Taxation and Currency Risk Host Country Corporate Law affecting Foreign Investment; Minority Ownership Investments; Controlling, Currency Risk: Currency Swaps, Arrangements with Soft Currency Country, Payment and Price Adjustment Approaches, Structuring of Hard Currency Obligations and Revenues, Countertrade, Informal Consortia or Parallel Exchanges, Inconvertibility Insurance.

Unit 5: Indian Laws and Regulations

Governing International Transactions: FEMA; Taxation of foreign income; foreign investments; Setting up offices and branches abroad; Restrictions on trade in endangered species and other commodities.

Prescribed Books:

1. Daniels, John, Ernest W. Ogram and Lee H. Redebungh, international business, environments and operations.
2. Kapoor ND, COMMERCIAL LAW; Sultan Chand & Co., New Delhi.
3. Lew, Julton D.M and Clive Stand brook (eds), International Trade Law And Practice, Euromoney Publications, London.
4. Motiwal OP, Awasthi, International Trade – The Law And Practice, Bhowmik and Company, New Delhi.
5. Schmothoff C.R: Export Trade, The Law And Practice Of International Trade.

Suggested Readings:

1. Schaffer, Agusti & Earle (2009): International Business Law: A Comprehensive Approach, Cengage Learning, New Delhi.
2. Lew, D. M., Julton, C live (2009): International Trade Law and Practice, Euromoney Publications, London.

COURSE CODE	MB403H
COURSE TITLE	GLOBAL MARKET RESEARCH
COURSE CREDITS	3

Course Description:

This course is intended to broaden student appreciation of world markets by concentrating on topics such as global cultures and environments, political and economic institutions, regional characteristics, market assessment/selection and market entry strategies.

Course Objectives:

1. To highlight the significance of International Marketing Research and provide a compressive understanding the research process.
2. To develop an in-depth knowledge of the challenges associated in conducting market research internationally.
3. To understand the simple and advanced data analysis for International Marketing Research.
4. To make sound marketing decisions on the basis of collected and analyzed data.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
403H.1	Remember	STATE the nature, scope, complexities, issues, and organizational framework of international marketing research.
403H.2	Understand	EXPLAIN the marketing research process and data analysis for International Marketing research.
403H.3	Apply	DEMONSTRATE with examples how international market research is carried out and what steps are followed for doing a scientific market research.
403H.4	Analyze	ORGANIZE various facts related to different issues related to international markets for interpretation.
403H.5	Evaluate	APPRAISE various methods of market research used in International context for better interpretation of facts.
403H.6	Create	DEVELOP suitable solution to the issues related to international markets with the use of suitable case studies.

Course Outline:

Unit 1: Foundation of International Marketing Research

Nature and scope of marketing research; marketing research in international context-importance, complexities and issues; Organizational framework for international marketing research; International Marketing Information System (IMIS).

Unit 2: Marketing Research Process

An overview; problem identification and definition; Preparing research proposal; Exploratory, descriptive and experimental research designs; international secondary data sources; Primary data

collection methods and complexities of data collection in international marketing research; Online data sources and research.

Unit 3: Designing Questionnaire

Etic and emit dilemma; Sample design – sampling methods and sample size determination; Fieldwork and data collection; Sampling and non-sampling errors.

Unit 4: Multi – country Data Analysis and Interpretation

Data editing and coding preliminary data analysis, Univariate and multivariate data analysis techniques- Discriminate analysis, factor and conjoint analysis: (including application software). Issues in multi- country data analysis-Data comparability and validity problems; Report preparation and presentation.

Unit 5: Cross-cultural Consumer Research

Attitude measurement and scaling techniques; Product research; Advertising research; International market opportunity analysis; Ethical issues in international marketing research.

Prescribed Books:

1. International Marketing Research by V. Kumar, Pearson Education, 1st edition.
2. Aaker, David A, V. Kumar arki George S Day, Marketing Research, John Wiley and Son, New York, 2001.
3. Boyd, Harper w, et al Marketing Research: Text and Cases, Irwin, Homewood Illinois.
4. International Marketing Research by Craig & Douglas, Wiley, 3rd edition.
5. Green, P.E. et al, Research for marketing Decisions, Prentice Hall of India Ltd., New Delhi.
6. Malhotra, Naresh K., International Marketing Research - An Applied Orientation, 3rd ed. Person Education Asia.

Suggested Reading:

1. Alex Rialp, Josep Rialp (2006), “International Marketing Research: Opportunities and Challenges in the 21st Century”, International Marketing Research (Advances in International Marketing, Volume 17), Emerald Group Publishing Limited, pp.1-13
2. Douglas, S.P. and C.C. Samuel (2000) “Conducting International Marketing Research in the 21st Century”, International Marketing Review
3. Douglas, Susan P; Craig, C. Samuel (2006) “On Improving the Conceptual Foundations of International Marketing Research” Journal of International Marketing. 2006, Vol. 14 Issue 1, p1- 22. 22p
4. Sarstedt, Marko; Schwaiger, Manfred; Taylor, Charles R (2011) “Introduction: Measurement And Research Methods In International Marketing”. Advances in International Marketing. 2011, Vol. 10 Issue 22, p3-7
5. Barnard, P. (1997), “Global developments and future directions in marketing research, " Globalization and the Millennium: Opportunities and Imperatives, Marketing Science Institute, June 16-17, Brussels, Belgium

COURSE CODE	MB404H
COURSE TITLE	INTERNATIONAL MARKETING
COURSE CREDITS	3

Course Description :

International marketing is the export, franchising, joint venture or full direct entry of a marketing organization into another country. This can be achieved by exporting a company's product into another location, entry through a joint venture with another firm in the target country, or foreign direct investment into the target country.

Course Objectives:

1. To bring countries closer for trading purpose and to encourage large scale free trade among the countries of the world.
2. To bring integration of economies of different countries and there by to facilitate the process of globalization of trade.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
404H.1	Remember	STATE various theories and concepts applicable in International marketing.
404H.2	Understand	Explain various international marketing strategies used to succeed in International markets.
404H.3	Apply	Use basic international marketing theories and concepts to understand the environment.
404H.4	Analyze	ORGANIZE AND RELATED the environmental variables that influence international marketing.
404H.5	Evaluate	APPRAISE data, information, and evidence related to international business opportunities and threats relevant in the current world.
404H.6	Create	DEVELOP sustainable competitive advantage and international marketing strategies that are designed to increase the chances for the firm to be successful in a foreign market.

Course Contents:

Unit 1: Introduction to International Marketing

Basic terms like exporting, export marketing, deemed exports, Definitions of international marketing, International marketing concept, Objectives, challenges and opportunities in international marketing.

Unit 2: Multinational Market Regions and Market Groups

Strategic implications for marketing, market barriers, marketing mix implications, The commonwealth of independent states, Key provisions of NAFTA, Region wise trading groups and emerging markets, Global Market Segmentation-Advertising strategy Goals, Product Attribute Benefit segmentation, Regional segmentation.

Unit 3: Products and services for Consumers

Analyzing product components for adoption, product concept model, Packaging component,

support service component, Marketing consumer services globally, barriers in entering global markets for consumer services Top 20 brands.

Unit 4: Developing Global Marketing Strategy

Benefits of global marketing, planning for global markets, the planning process, Obtaining export credit insurance, Golden rules for successful exporting, ECGC – Insurance policies and Financial Guarantees, Rules for successful exporting, EXIM Bank.

Unit 5: Export Promotion

Need for export promotion, Institutional Infrastructure, Incentives, Facilities, assistances provided to exporters.

Prescribed Books:

International Marketing – By Philip R. Cateora; John L. Graham and Prashant Salwan, TATA McGraw-Hill publication, Thirteenth edition

GBS RC MBA Syllabus

COURSE CODE	MB405H
COURSE TITLE	INTERNATIONAL FINANCE AND FOREX MANAGEMENT
COURSE CREDITS	3

Course Description :

The goal of the course is to provide students with a deep understanding of financial management issues in a global setting. The course aims to help students develop analytical tools that incorporate key international considerations into fundamental financial decisions. The cases provide opportunities to build the skills needed to create and capture value across borders.

Course Objectives:

1. To introduce the environment of international finance and its implications on international business.
2. To analyze the nature and functioning of foreign exchange markets, determination of exchange rates and their forecasting.
3. To explore the international sources of long term finance. Integrate the global developments with the changing business environment in India.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
405H.1	Remember	DEFINE the concepts and STATE the facts related to International Finance and Forex management.
405H.2	Understand	DISCUSS and EXPLAIN the concepts of Balance of payments, exchange rates, Methods of Payment, exchange control regulations, etc.
405H.3	Apply	INTERPRET various issues related to international finance and foreign exchange happening on international level by using facts published in various sources.
405H.4	Analyze	Compare and contrast between, BOP and BOT Position of the countries, between various exchange rates and quotation, and methods of trade settlement.
405H.5	Evaluate	APPRAISE various aspects of Forex Markets, Exchange regulations, and overall foreign exchange related environment in India.
405H.6	Create	INVESTIGATE various facts related to foreign exchange transactions and intricacies involved in to the same with the help of case studies.

Course Contents:

Unit 1:

Foreign Exchange Transaction, Transfer of Funds, Nostro and Vostro account.

Unit 2:

Balance of Trade, Balance of Payment, Current account transactions, Capital account transactions, Reserves, Convertibility.

Unit 3:

Rates of Exchange, Factors affecting movement of exchange rates, Management of risk due to fluctuation of rate of exchange, Forward contract.

Unit 4:

Documents used in International trade, Methods of payment, Guarantees, Letter of Credit, Export Finance

Unit 5:

Exchange Control Regulations, Forex Markets, Trade Control Regulations, Agencies in International Trade.

Prescribed Books:

International Financial Management, Text and Cases, V K Bhalla, Anmol Publications.

Suggested Readings:

1. International Financial Management by Thummulur; Siddiah
2. International Financial Management – by Madhu Vij --- excelbooks
3. International Finance and Trade – ICAI publication – 2 volumes

GBSRC MBA Syllabus

COURSE CODE	MB406H
COURSE TITLE	INTERNATIONAL BUSINESS STRATEGY
COURSE CREDITS	3

Course Description :

The primary need and purpose is to become familiar with a number of strategy concepts as well as to see how business strategy fits with broader dynamics in the society. We will start the discussion about business sustainability and the potential limits to economic growth that will be continued through different parts of the course.

Course Objectives:

1. To understand the nature of strategic competitiveness and develop the ability to analyze the competitive environment facing a firm, assess the attractiveness of the industry and isolate potential sources of competitive advantage and disadvantage.
2. To develop business level strategies by defining the type of advantage sought, scope of operations and activities required to deliver the chosen strategy.
3. To consider the actions of competitors and how that impacts your ability to reach your strategic goals.
4. To develop courses of actions that incorporate the actions of multiple players in the marketplace.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
406H.1	Remember	DEFINE various concepts of international business strategy and STATE the importance of same in international business environment.
406H.2	Understand	EXPLAIN the concepts of Business Strategy Formulation, International Business Strategic Planning and implementation
406H.3	Apply	USE and INTERPRET various issues on international to develop a practical understanding about the concepts and its applications.
406H.4	Analyze	EXAMINE various aspects of international markets to design a suitable business strategy.
406H.5	Evaluate	APPRAISE the impact of statutory and regulatory compliance on an organization's integrative trade initiatives.
406H.6	Create	DEVELOP and present an international marketing plan, and evaluate sales strategies that support an organization's integrative trade initiatives.

Course Contents:

Unit 1: Introduction to International Business Strategy

International Business Strategy – Scope and Importance of IBS, Purpose of Business, Difference between Goals and Objectives of Business, Conceptual Evolution of Strategy.

Unit 2: Business Policy and Strategic Management

Type of Business Policy and Strategic, Factors influencing Business Strategies, Objectives of Strategic Management, Causes for Failure of Strategic Management.

Unit 3: Business Strategy Formulation

Types of Strategies, Steps in Strategies Formulation, Factors to be Considered for Environmental Scanning, Core Competencies and Their Importance in Strategy Formulation.

Unit 4: International Business Strategic Planning and implementation

Strategic Planning Process, Types of Strategies –Stability, Expansion or Growth, Mergers and Acquisitions, Issues in Strategy Implementation, Integrating the Functional Plan and Policies.

Strategic Analysis and Choice :

Process of Strategic Analysis, Tools and Techniques for Strategic Analysis, Strategist's Decision Style and Attitude to Risk, Experience Curve Analysis.

Unit 5: Business- Level Strategies

The Foundations of Business – Level Strategies, Business – level Strategies, Integrating Cost Leadership and Differentiation.

Functional and Operational Implementation :

Functional Strategies (Vertical and Horizontal), Financial Plans and Policies (Need and Nature), Marketing Plans and Policies (Product, Pricing, Place, Promotion, Integrative).

Prescribed Books:

1. Strategic Management and Business Policy by AzharKazmi.
2. International Business Strategy - Rethinking the foundations of global corporateSuccess by AlainVerbeke.

Reference Books:

1. Strategic Marketing BY Douglas West.

COURSE CODE	MB407H
COURSE TITLE	EXPORT IMPORT PROCEDURES & DOCUMENTATION
COURSE CREDITS	3

Course Description:

There is not a single country in the world, which can claim itself self-sufficient and produce all the goods and services required by its residents. Globalization has affected all countries of the world and global trade is growing at pace that makes it importance for business to stay attuned to the changing world economy. The emerging economies along with the developed countries have identified the role of international trade.

Course Objectives:

1. To understand Export & Import procedures.
2. To understand the procedures, regulations, stipulations, provisions and opportunities involved in export and import.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
407H.1	Remember	STATE various concepts and theories related to international trade.
407H.2	Understand	DESCRIBE the major theories, concepts & methods in the field of International Trade
407H.3	Apply	USE various provisions of Customs act to suggest a suitable export and import documentation strategy.
407H.4	Analyze	EXAMINE various aspects of trade law to develop a suitable documentation strategy.
407H.5	Evaluate	APPRAISE the legal environment and Export Import Regulatory Framework present in India.
407H.6	Create	Use the knowledge of various procedures of export and import to suggest and to select a suitable export and import strategy.

Course Contents:

Unit 1: International Trade

Theories : Theory of absolute cost advantage, Theory of comparative advantage, H-O theory, Methods of International Trade : Exporting, Licensing, Franchising, Joint Venture.

Unit 2: Export Import Regulatory Framework

Foreign Trade Act 1992, FEMA 1999, Customs Act 1962.

Unit 3: Import Documentation

Bill of Entry, Registrations for Import, Import License, L/C and types of L/C.

Unit 4: Export Documentation

IEC Certificate, Registration of Exporters, EPC Registration, Export Assistance in India, SEZ.

Unit 5: Invoice

Commercial Invoice, Proforma Invoice, Consular Invoice, Customs Invoice.

Prescribed Books

1. Export Import Management By Justin Paul and Rajiv Aserkar, Oxford Publishing.
2. Export Management, BY P. K. Khurana, Galgotia Publishing.

Suggested Readings

1. Export Import Management by Parul Gupta – Mc Graw Hill edition.
2. <http://niryatbandhu.iift.ac.in/exim/>

GBSRC MBA Syllabus

HOSPITAL AND HEALTHCARE MANAGEMENT SPECIALIZATION

COURSE CODE	MB401I
COURSE TITLE	CASES IN MANAGEMENT (HOSPITAL & HEALTHCARE MANAGEMENT)
COURSE CREDITS	3

Course Description:

The course aims to get the students thinking and discussing issues pertaining to management drawing on what they already know. To increase awareness and knowledge of contemporary management issues and to allow students the opportunity to discuss and critically analyse source materials, in order to both enhance their understanding of the topics and to practice their analytical and debating skills.

Course Objectives:

1. To give students the confidence and experience of debating issues on the managerial command.
2. To give exposure exposure of real life Business situation and decision making with the best possible use of resources.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
401I.1	Remember	STATE the cases related to patient satisfaction in hospitals.
401I.2	Understand	DESCRIBE the SOPs related to Quality Improvement in Hospitals.
401I.3	Apply	EXECUTE the Digital Marketing in Healthcare and the opportunities and challenges associated with it.
401I.4	Analyze	DIFFERENTIATE among the different Supportive Services in Hospital.
401I.5	Evaluate	CRITIQUE the functioning of Community Health Management or any given case topic.
401I.6	Create	DEVELOP models of Community Health Management as per the needs of community or any given case topic.

Course Outline:

To facilitate student learning, a range of source materials will be used throughout the course to direct and stimulate discussion, course will be having five case studies from the contemporary topics of the specializations of management students which is to be discussed in the class room by respective subject faculty. Students are also encouraged to put forward their own ideas for sessions, and to contribute source materials where appropriate to increase engagement in, and relevance of, the course for students. Case analysis and presentations will be an integrate part of learning case studies.

CASES IN MANAGEMENT (HOSPITAL & HEALTHCARE MANAGEMENT)

1. Five cases to be discussed analyzed and presented from the following topics.
2. Following are the suggested topics however are not limited and open for contemporary topics.
 1. Patient Satisfaction
 2. Quality Improvement in Hospital
 3. Cashless Hospitalization
 4. Supportive Services in Hospital
 5. Hospital Information System
 6. Biomedical Waste Management
 7. Digital Marketing in Healthcare
 8. Drug Addiction & Drug Abuse
 9. Community Health Management
 10. Telemedicine

GBSRC MBA Syllabus

COURSE CODE	MB402I
COURSE TITLE	FINANCIAL MANAGEMENT OF HOSPITAL & HEALTHCARE ORGANISATIONS
COURSE CREDITS	3

Course Description:

This course is being introduced to provide better understanding of the organisation's financial performance and to manage the finances of the clinicians and healthcare experts that will help to enter the discussion with financial managers to manage different ways of funding health services. Also, to analyse the ways of regulating the private/public mix, both the finances & in provision of financial reforms of public health sector for hospital and healthcare organisations.

Course Objectives:

1. To understand the role of financial management in hospital and healthcare organisations.
2. To know how the primary role of financial management in healthcare organizations manages money and risk in a way that helps to achieve the financial goals of the organization.
3. To assess how the financial management in healthcare organizations include evaluation and planning, long-term investment decisions, financing decisions, working capital management, contract management, and financial risk management.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
402I.1	Remember	STATE the role of financial management in hospital and healthcare organizations.
402I.2	Understand	DESCRIBE Financial Statements for Hospital and Healthcare Management.
402I.3	Apply	SOLVE the Problems using Accounting and Income statements in healthcare.
402I.4	Analyze	EXAMINE the Financial Statements of Hospital and Healthcare Organization.
402I.5	Evaluate	JUDGE the needs of Healthcare Staffing and Forecasting.
402I.6	Create	DESIGN the Healthcare Plan and Budget with Project costs and Evaluation.

Course Outline:

UNIT 1: Healthcare Financial Management & Revenue Cycle

Financial Management in Healthcare Organizations: Roles & Functions, Finance Department in Healthcare Organizations: Role & Structure, Comparing Financial & Managerial Accounting, What Are the Goals of Financial Management? What is Healthcare Revenue Cycle? - Definition & Steps, Cash Management in Healthcare Systems, Impact of Cash Management on Viability, liquidity, Cash management practices, Financial Supply Chain Management in Healthcare, Measurement Tools & Methods Used in Healthcare Finance, Managing Costs & Revenues in

Healthcare Organizations.

Unit 2: Accounting and Income statements in Healthcare

The Differences Between Accrual & Cash-Basis Accounting, What Is an Income Statement? - Purpose, Components & Format, What Is Revenue? - Definition & Concept, Operating Income within a Healthcare Organization, Non-Operating Income within a Healthcare Organization, What Is Net Income? - Definition & Formula.

Unit 3: Balance Sheets and Financial Assessment in Healthcare

The Balance Sheet: Purpose, Components & Format, What Are Assets? - Definition & Examples, Current & Long-Term Liabilities: Definition & Characteristics, The Statement of Cash Flows: Purpose, Format & Examples, Financial Statement Analysis: Definition, Purpose, Elements & Examples, Defining and Applying Financial Ratio Analysis, Profitability Ratio: Definition, Formula, Analysis & Example, Liquidity Ratio: Definition, Calculation & Analysis, Leverage Ratios: Types & Formula, Activity Ratios: Definition, Formula & Analysis.

Unit 4: Healthcare Planning and Budgeting with Project costs and Evaluation

What Are Strategic Plans in Business? - Definition & Examples, What Are Operational Plans for a Business? - Definition, Types & Examples, What Is an Operating Budget? - Definition & Examples, Variances in Budgets: Definition, Calculations & Analysis, What Is Capital Budgeting? - Techniques, Analysis & Examples, Capital Projects in Healthcare: Types & Examples, Financial Risk: Types, Examples & Management Methods.

Unit 5: Healthcare staffing needs and Forecasting

Business Forecasting: Methods & Analysis, Forecasting Staffing Needs in Healthcare Organizations, Finance & Staffing in Healthcare Organizations, What is a Prevailing Wage? - Definition & Calculation.

Assignment 1 - Healthcare Finance & Budgeting - 1: Accountable Care Organizations.

Assignment 2 - Healthcare Finance & Budgeting - 2: Operating Budget.

Prescribed Books:

1. Michael Nowicki, 2007, The Financial Management of Hospitals and Healthcare Organizations.
2. Gapenski 's, Understanding Healthcare Financial Management.

Suggested Readings:

1. Healthcare: financial management and changing face of, 16; future of, 380–84, Health Care and Education Reconciliation Act of 2010, 103, 121, 135, 375.

COURSE CODE	MB403I
COURSE TITLE	INTRODUCTION TO ARTIFICIAL INTELLIGENCE IN HEALTHCARE
COURSE CREDITS	3

Course Description:

This course is being introduced to know how the AI has contributed in delivering major advancements in quality and safety of patient care at reduced cost, with some observers even suggesting it to represent an imminent revolution in clinical practice in Hospital & Healthcare Industry. Clinicians can and must be part of the change that will accompany the development and use of AI. This will require changes in behavior and attitude including rethinking in many aspects of doctors' education and careers as currently there is too much uncertainty about accountability, responsibility and the wider legal implications of the use of this technology.

Course Objectives:

1. To understand the use of Artificial Intelligence in healthcare and the significant opportunities and benefits it offers to patients and clinicians, there are substantial implications for the way health and care systems across the world.
2. To know how the Artificial intelligence describes a range of techniques that allow computers to perform tasks typically thought to require human reasoning and problem-solving skills.
3. To know how the Artificial intelligence could improve access to healthcare, providing advice locally and in real time to patients or clinicians and identifying red flags for medical emergencies.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
403I.1	Remember	STATE the fundamental theories, concepts, terms, models, frameworks of AI. Also digital technology application in healthcare management
403I.2	Understand	EXPLAIN the importance of data and its application for maintaining the healthcare record.
403I.3	Apply	MAKE USE OF Clinical Contribution of AI in Healthcare.
403I.4	Analyze	EXAMINE the usage of Artificial Intelligence tools & its impact
403I.5	Evaluate	APPRAISE the Public Acceptance and Trust for the use of AI in Healthcare.
403I.6	Create	DESIGN the Startup Plan for AI based Healthcare Organization.

Course Outline:

Unit 1: Introduction to Artificial Intelligence

What is AI and how could it improve health care? Advantages and Disadvantages, Benefits & risks of AI, Scope of AI, Myths about AI, Advancements of AI with respect to technology in Healthcare.

Unit 2: The impact of AI on Patients, Clinicians, and Pharma

Patient-facing AI: Improving experiences, costs, and outcomes, AI for clinicians: Tools for more effective diagnoses and treatment, AI for Pharma: Reduced time and cost for drug discovery, AI in preventive healthcare, AI for more informed and effective treatment plan design and delivery, From clinical to operational: How big data and analytics can improve outcomes and efficiency.

Unit 3: Clinical Contribution of AI in Healthcare

Introduction to Robotics, History of Robotics, Types of Robotic surgeries, Robotics in India, Da Vinci Robotic System, Challenges and Barriers, Limitations of Robotic Surgeries.

Unit 4: Public Acceptance and Trust

Accountability for decisions, Bias, inequality and unfairness, Bias, inequality and unfairness, Training and education, Medical research, Intellectual property and the financial impact on the healthcare system, reducing the errors in AI.

Unit 5: The Future of AI in Healthcare

A better patient journey, new ways to deliver care, AI in health Insurance, New risks to address, Leveraging lessons learned, Impact on the wider healthcare system, Role of start-up companies in AI in Healthcare.

Prescribed Books:

1. Dr. Parag Mahajan, Artificial Intelligence in Healthcare: AI, Machine Learning, and Deep and Intelligent Medicine.
2. Adam Bohr Kaveh Memarzadeh, Artificial Intelligence in Healthcare.
3. Arvind Agah, Medical Application of Artificial Intelligence.

Suggested Readings:

1. Max Tegmark, Future of Life Institute, “Benefits & Risks of Artificial Intelligence”, <https://futureoflife.org/background/benefits-risks-of-artificial-intelligence/>, accessed June 24, 2019
2. Laura Craft, Emerging Applications of Ai for Health care Providers, GARTNER, June 30 2017, <https://www.gartner.com/>

COURSE CODE	MB404I
COURSE TITLE	MANAGEMENT OF CORPORATE HOSPITALS
COURSE CREDITS	3

Course Description:

This course is to introduce management concepts and process with a focus on leadership and human behaviour in organizations.

Course Objectives:

1. To introduce principles of hospital management and the functional organization of a hospital.
2. To understand the concept of Health Care Industry and its ever-changing character.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
404I.1	Remember	IDENTIFY the legal and regulatory environment in healthcare and implications for managers within the field.
404I.2	Understand	RELATE to the important functions and management of hospital.
404I.3	Apply	IMPLEMENT healthcare delivery systems along with the associated operational and financial aspects associated with each.
404I.4	Analyze	INSPECT the dynamic nature of healthcare administration and demonstrate the problem solving and leadership skills to manage resources as needed within this environment.
404I.5	Evaluate	PRIORITIZE the issues in hospital management.
404I.6	Create	DEVELOP solutions for the problems and issues in hospital management

Course Content:

Unit 1: Understanding functioning of Corporate multi-specialty hospital, Managerial activities for effective hospital functioning.

Unit 2: Duties and responsibilities of Hospital Managers, Qualities of effective Managers.

Unit 3: Effective inter and intra departmental co-ordination, Rules and regulations of international health policy.

Unit 4: Medico- Legal Problems in relation to health administration, Law of Contracts, Specific Performance.

Unit 5: Law applicable to Hospital employees, Medical jurisprudence and functioning of hospitals, Consumer Protection Act and Hospitals.

Suggested Readings

1. Hospital Administration, Tabish.
2. Hospital Administration, S. L. Goel.
3. Hospital Administration, Sakaharkar.

COURSE CODE	MB405I
COURSE TITLE	HOSPITAL WASTE AND HYGIENE MANAGEMENT
COURSE CREDITS	3

Course Description:

Due to the nature of their work, hospitals produce a variety of waste substances, including biological wastes, needles, and discarded drugs. Because these substances can be hazardous if not disposed of properly, hospitals must create a stringent waste management program to ensure the safe and efficient disposal of dangerous wastes.

Course Objectives:

1. To evaluate technical and sanitary aspects of hospital waste management situation in selected facilities, regarding to handling, storage, treatment, collection and final disposal.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
405I.1	Remember	IDENTIFY appropriate personal protective equipment to handle regulated medical waste.
405I.2	Understand	UNDERSTND AND INTERPRET regulated medical waste into non-infectious and infectious categories and Prepare infectious waste containers for proper disposal.
405I.3	Apply	DISCOVER waste management practices and technologies that are safe, efficient, sustainable, economic and culturally acceptable; to enable the participants to identify the systems suitable for their particular circumstances.
405I.4	Analyze	CORRELATE waste management practices with systems and technologies that are safe, efficient, sustainable, economic and culturally acceptable.
405I.5	Evaluate	PLAN the waste management practices ad SOPs.
405I.6	Create	DESIGN the waste management systems and SOPs

Course Content:

Unit 1: Introduction, Definition of General and Hazardous health care waste, Infectious waste, Genotoxic waste, Waste Sharps, Biomedical waste – categories Categorization and composition of Biomedical waste. Specification of materials. Colour coding. Sources of Health care wastes, Hospitals and health care establishments and other sources.

Unit 2: Health Impacts of Biochemical waste. Direct and Indirect hazards, Potential health hazards. Persons at risk. Basic information about- What infection ? Infection agents on organizations spread of infection Basic information about Hospital acquired infection.

Unit 3: Legislation and policies on Health care waste management. Biomedical waste Management and handling Rules, 1998 and its amendment there after. CPCB guidelines. (Central pollution control board) Some idea on Safe disposal of Radioactive waste Rules, 1995 guideline of BARC.

Unit 4: International Scenario World Health Organization guidelines on

- a) Management of wastes from Hospital waste
- b) Management of hospital wastes in

c) Developing countries

Unit 5: Basic steps in Health Care Waste Management Segregation at the point of generation sharp Decontaminating/ Disinfections unit container for autoclaving Sharp waste containers for storage and transportation autoclaving/shredding /incrimination/ bio hazard symbols. Microwave, Hydropulping, plasma torch.

Hygiene Management: Importance of hygiene and safety, Applied areas of Hygiene Management: Operational hygiene, Kitchen Hygiene, (Drinking) water systems, Air- conditioning systems and Hotel Hygiene.

Prescribed Books:

1. The Book of Hospital Waste Management Hardcover – February 15, 2003 by B.D. Acharya, MeetaSingh.
2. Hygiene For Management 17th Edition- Bertrams-1909749265.

GBSRC MBA Syllabus

COURSE CODE	MB406I
COURSE TITLE	MARKETING OF HOSPITAL AND HEALTHCARE SERVICES
COURSE CREDITS	3

Course Description:

Clinics, hospitals and medical practices must develop marketing plans to attract patients to their facilities in an increasingly competitive field. As with most industries, the marketing of health-care services requires some astute planning and a clear focus on the objectives of the campaign.

Course Objectives:

1. To study how to educate patients about serious health conditions, such as heart disease and diabetes, and how to avoid getting them.
2. To study how hospitals promote their services through free or discounted health screenings for such Chronic Healthcare conditions.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
406I.1	Remember	IDENTIFY the mechanism of how and why prospective patients choose a healthcare provider.
406I.2	Understand	UNDERSTAND the tools and techniques with which healthcare facilities can develop and implement marketing plans capable of transforming their reputation and success.
406I.3	Apply	DISCOVER the needs and wants of tourists with policies.
406I.4	Analyze	CORRELATE to the demands of the market .
406I.5	Evaluate	CRITICIZE the needs of the supply and demand side.
406I.6	Create	DEVELOP plan for marketing, promotion or advertising of healthcare services, including those involved in facilitating medical tourism.

Course Content:

Unit 1: Introduction to Marketing of Health Care services :

Introduction, Meaning and Scope of Marketing in HealthCare, Distinctive Nature of Service Marketing, Service Marketing mix, Service Quality and Marketing, Implication of Epidemiology in the healthcare service marketing, 4S Model of Health care service marketing and its application

Unit 2: Marketing of Hospital Services:

Introduction of marketing needs for hospital services, Types and techniques of hospital service marketing- Telephone Courtesy, Guest Lectures, Organization of Camps, Seminars, Workshops, Continuous Medical Education, Public Participation

Unit 3: Pricing and pricing strategies of Healthcare Services:

Pricing Objectives- Revenue Oriented Pricing Objectives Marketing Skimming Objectives, Market Penetration Objectives, Operations Oriented Pricing Objectives G. Patronage Oriented Pricing Objectives. Different pricing techniques- Cost Based Pricing, Competition Based Pricing, Demand Based Pricing, Pricing when Value to the Customer in low Price, Price Discount, Old Pricing, Place Differentiates, Quality Differentials.

Pricing strategies

Unit 4: Marketing and Value creation process for healthcare services:

Concept of value for healthcare services, value creation mechanism for patients, Value chain development for healthcare services, Holistic marketing framework for value creation, Notion of value, Value creation through problem solving and customer experience aspects

Unit 5: Marketing Communication for healthcare services :

Importance of communication in healthcare marketing, Stakeholders of healthcare communication, Modes and techniques of healthcare communication, Business vs healthcare communication, Importance & Barriers to Effective healthcare Communications, Communication Skills, Influencing Techniques, Internal and external communication in Healthcare organisations

Prescribed Books

1. Marketing – Roger Kerin and Steven W. Hartney – McGrawHill.

GBSRC MBA Syllabus

COURSE CODE	MB407I
COURSE TITLE	PLANNING & MANAGEMENT OF HOSPITAL CLINICAL & SUPPORTIVE SERVICES
COURSE CREDITS	3

Course Description:

Hospital planning and management, at both the facility and health system level. ... Hospitals should also link to and support primary health services and health ... governance, reduce the gap between clinical and managerial cultures, and bring the ... patient is assigned a medical unit summary that includes a primary and tertiary system.

Course Objectives:

1. To understand the structure and functions of clinical and supportive service departments of a hospital and health care organization.
2. To develop skills in planning, building and managing clinical and supportive service departments of a hospital and health care.
3. To make familiarize students with concepts and techniques of Modern Management in different health care units.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
407I.1	Remember	IDENTIFY Hospital planning and management at both the facility and health system level.
407I.2	Understand	INTERPRET the structure and functions of clinical and supportive service departments of hospital and health care organization.
407I.3	Apply	DEMONSTRATE skills in planning, building and managing clinical and supportive service departments of a hospital and health care.
407I.4	Analyze	DIFFERENTIATE clinical and managerial cultures of Hospital's Clinical and Supportive Service and reduce its gap.
407I.5	Evaluate	APPRAISE the concepts and techniques of Modern Management in different health care units.
407I.6	Create	DESIGN steps to Organize and Administer various Clinical and Supportive Service of Hospital.

Course Content:

Unit 1: Introduction of Hospitals and it's departments

Concept of Hospitals - Planning and Design of Hospital (Building & Physical Layout) - space Required for Separate Functions - History of Hospital Development - Departmentation and organization structure of different types of hospitals. Organization - Structure - Vertical & Horizontal - Clinical & Non - clinical - supportive & Ancillary Service Departments.

Unit 2: Management & Organization of Clinical Services

Organization and Administration of various clinical services - Outpatient service - Inpatient Services - Emergency Services - Operation Theater - ICUs - super Specialty Service including

their utilization study - Nursing Care and Ward Management.

Unit 3: Planning & Organization of Support Services

Imaging - CSSD - Laboratory - Blood Bank - diet - Medical Records - Mortuary - Pharmacy - Admission and Discharge Procedure - Billing Procedure - Bio Medical Equipments Planning.

Unit 4: Organization & Management of Utility Services

Organizing and Managing Facility Support Services - Laundry - Housekeeping - Pest control managing the Estate (Hospital Security) - Recent trends in disaster Management - Hospital Engineering Services (Plumbing, electricity, Civil, A/c, Lifts)- Ambulance Service.

Unit 5: Clinical Information Systems

Management decision and Related Information Requirement – Clinical Information Systems – Administration Information systems: Support Service Technical Information Systems – Medical Transcription.

Prescribed Books:

1. Management Information System, James A.O'Brien, Tata Mc-graw Hill.
2. Health Management Information System, Jack Smith, Open University Publication, U.K.
3. Health Policy and Management - The health care Agenda in a British political context - column Paton, 1996, Chapman & Hall Publication (Madras).

Suggested Readings:

1. Health Sector Reform in Developing Countries - Peter Berman, Harvard University Press, 1995.
2. Health Planning For Effective Management - William A. Reinke, 1988, Oxford University Press.
3. Managing a Modern Hospital, A.V.Srinivasan, Response Books.

OPERATIONS AND SUPPLY CHAIN MANAGEMENT SPECIALIZATION

COURSE CODE	MB401J
COURSE TITLE	CASES IN MANAGEMENT (OPERATIONS AND SUPPLY CHAIN MANAGEMENT)
COURSE CREDITS	3

Course Description:

The course aims to get the students thinking and discussing issues pertaining to management drawing on what they already know. To increase awareness and knowledge of contemporary management issues and to allow students the opportunity to discuss and critically analyse source materials, in order to both enhance their understanding of the topics and to practice their analytical and debating skills.

Course Objectives:

1. To give students the confidence and experience of debating issues on the managerial command.
2. To give exposure exposure of real life Business situation and decision making with the best possible use of resources.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
401J.1	Remember	DESCRIBE the major theories, concepts, terms, models, frameworks, and research findings in the field of Operations and Supply Chain Management.
401J.2	Understand	SUMMARIZE the impact of Current OSCM trends on OSCM Functions.
401J.3	Apply	MAKE USE OF the Theories, Models, Principles and Frameworks of OSCM in analyzing the cases of OSCM.
401J.4	Analyze	ATTRIBUTING the OSCM Case with reference to Theories, Models, frameworks of OSCM.
401J.5	Evaluate	APPRAISE a Case on any one of the given OSCM Concepts or Problem or Scenario.
401J.6	Create	CREATE organization structure for R & D.

Course Content:

To facilitate student learning, a range of source materials will be used throughout the course to direct and stimulate discussion, course will be having five case studies from the contemporary topics of the specializations of management students which is to be discussed in the class room by respective subject faculty. Students are also encouraged to put forward their own ideas for sessions, and to contribute source materials where appropriate to increase engagement in, and relevance of, the course for students. Case analysis and presentations will be an integrate part of learning case studies.

CASES IN MANAGEMENT (OPERATION AND SUPPLY CHAIN MANAGEMENT)

1. Five cases to be discussed analyzed and presented from the following topics.
2. Following are the suggested topics however are not limited and open for contemporary topics.
 1. Inventory Control Technique-EoQ and Safety stock.
 2. Just in Time Technique
 3. Total Quality Management
 4. Six Sigma Implementation
 5. Lean Management Techniques
 6. KAIZEN
 7. Warehousing Management System
 8. Material Requirement Planning
 9. Service Enhancement using internet
 10. Project Management

GBSRC MBA Syllabus

COURSE CODE	MB402J
COURSE TITLE	WAREHOUSE MANAGEMENT
COURSE CREDITS	3

Course Description:

The warehouse management course offers a practical introduction to warehouse management principles and techniques. The course is tailored to help the reader implement lean manufacturing in business environment to improve productivity, business resilience, and to reduce waste. The course also deals with warehouse functions and strategies in the modern world.

Course Objectives:

- 1 To understand functions of warehouse.
2. To highlight different techniques of warehousing.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
402J.1	Remember	STATE key concepts, theories & frameworks in the field of Warehouse Management.
402J.2	Understand	EXPLAIN the role, challenges & features of an ideal warehouse.
402J.3	Apply	IMPLEMENT various plans related to Product Assortment Management.
402J.4	Analyze	EXAMINE the various strategic Aspects of Warehouse Management.
402J.5	Evaluate	APPRAISE the various theories of Modern Warehouse Operations.
402J.6	Create	DEVELOP a warehouse management plan in terms of its location, structure & operations.

Course Outline:

Unit 1: Warehousing Introduction

Objectives, Stores and Warehousing, meaning of a Warehouse, Need for warehousing management, Evolution of warehousing, Role of a warehouse manager, Functions of Warehouses, Types of Warehouses, Warehousing Cost, Warehousing Strategies, Significance of Warehousing in Logistics, Warehousing Management Systems (WMS).

Unit 2: Role of Warehousing

Warehousing Function Model, Stock Valuation Retailing and Warehousing, Challenges in retail warehousing, setting up a warehouse, Role of government in warehousing, Characteristics of an ideal warehouse, Storing products in a warehouse.

Unit 3: Strategic Aspects of Warehousing

Different Types of Customers in Warehousing, Importance of Warehouse in a Value Chain,

Warehouse Location, Warehouse Structure, Warehouse Operations, receiving inventory, picking inventory, locating inventory, Organising inventory, Despatching inventory, Equipment Used for a Warehouse.

Unit 4: Strategic Retail Product and its Procurement

Product Assortment Management, Assortment management framework, Assortment objectives, Assortment selection, Assortment Plan, Product Selection, Retail Suppliers, Inventory Cost and Service, Lead Time, Demand Forecasting, Management of Stock Levels, Replenishment Methods.

Unit 5: Modern Warehouse Operations

Concept of Inventory Control, Impact of Stock Inaccuracy, Frequent Stock Checking, Security and Preventing Loss, World-class Warehousing, Warehousing — the way forward, Warehousing and Supply Chain.

Prescribed Books:

1. World-Class Warehousing and Material Handling by Edward Frazelle.
2. Fundamentals of Warehousing - With Worked Examples by Banihan Gunay.

Suggested Readings:

1. Basics of Distribution Management: A Logistical Approach by Kapoor.

GBSRC MBA Syllabus

COURSE CODE	MB403J
COURSE TITLE	LEAN MANAGEMENT
COURSE CREDITS	3

Course Description:

The Lean management course offers a practical introduction to lean management principles and techniques. The course is tailored to help the reader implement lean manufacturing in business environment to improve productivity, business resilience, and to reduce waste.

Course Objectives:

1. To outline the need for Lean Management.
2. To highlight different techniques of Lean implementation.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
403J.1	Remember	STATE principles, concepts and elements of Lean Management.
403J.2	Understand	DESCRIBE the various tools & techniques used in lean management process.
403J.3	Apply	EXECUTE techniques of lean management for business solutions
403J.4	Analyze	EXAMINE the future value stream mapping.
403J.5	Evaluate	APPRAISE the resources for Project Selection.
403J.6	Create	DEVELOP the lean management process at workplace.

Course Outline:

Unit 1: Elements of Lean Management

Lean Philosophy and Principles, Concept of Lean Thinking, Identifying Waste in the Production process, Lean Manufacturing, Value flow and Muda, Muri and Mura, Need for Lean Management.

Unit 2: Lean Tools and Techniques

Various tool of LM, Fundamental blocks of Lean, Impact of 5S, Need for TPM, Pillars of TPM, Implementation of TPM, Value Stream Mapping.

Unit 3: Lean System

Features manufacturing and services, Work flow, Small lot sizes, Pull Method, Kanban, KAIZEN, problem solving Techniques, Just in Time.

Unit 4: Project Selection for Lean

Resource and project selection, Selecting projects, Process mapping, Current and future value stream mapping, project suitable for lean initiatives.

Unit 5: Lean Management and Implementation

Standardized work, Continuous improvement. Push and Pull systems in Lean Manufacturing, Lean concept implementation, review. Productivity Improvement: Process, machinery Operator and equipment, Lean Leadership.

Prescribed Books:

1. The Machine That Changed the World, by Daniel Roos, Daniel T. Jones, and James P. Womack.
2. Production and Operations Management by Shailendra Kale.
3. Toyota Way by Jeffrey Liker.

Suggested Readings:

1. Lean Management: Concepts and Industry Perspectives by E Mrudula.
2. Lean Manufacturing and Tools by Shorya Sharma.

GBSRC MBA Syllabus

COURSE CODE	MB404J
COURSE TITLE	MANAGEMENT OF MANUFACTURING SYSTEM
COURSE CREDITS	3

Course Description :

This course introduces the viewer to the concepts of Manufacturing Systems Management. The course primarily addresses Cellular Manufacturing, JIT systems, Synchronous manufacturing and Flexible manufacturing.

Topics such as cell formation, cell scheduling, JIT systems, TOC principles, Loading and scheduling in Flexible manufacturing are addressed.

Course Objectives:

1. To Understand the concepts of inventory control.
2. To understand the concept of variety reduction and standardization.
3. To understand the concept of JIT and kanban.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
404J.1	Remember	STATE the stockholding policies and general stock control methods.
404J.2	Understand	DESCRIBE Variety reduction and standardization techniques for stock control.
404J.3	Apply	SKETCH the inventory management procurement process.
404J.4	Analyze	DISTINGUISH between the various aspects of physical stock management and its Control.
404J.5	Evaluate	JUDGE the application of BPR in productivity improvement.
404J.6	Create	ASSEMBLE the Materials requirements planning using hypothetical product.

Course Contents:

Unit 1: Determination of Stockholding Policy. Customer expectations – internal/external; supply market conditions; Categories of risks and their evaluation; Requirements of the business and the need for stock; Economics constraints; methods of avoiding carrying stock; General control methods e.g. ABC analysis. Control of Stock Range Coding, classification and categorization methods.

Unit 2: Variety reduction and standardization; Application and approval of new stock items; Control of slow moving; obsolete and redundant stock; Role of and function in determining stock range, Control of Stock Levels Forecasting techniques in relation to demand and lead times; Independent demand situations and the use of fixed order quantity and periodic review systems; Techniques for dealing with dependent demand.

Unit 3: The Kanban approach and Just in Time philosophy; Coping with uncertainty in achieving required service levels; Suppliers contribution to controlling stock. Management of Storage

Facilities. Identifying types of commodities to be stored and their characteristics with regard to storage and handling needs; Materials requirements planning (MRP) and manufacturing resource planning (MRPII) and distribution requirements planning (DRP); Pull systems.

Unit 4: Physical Management of Stock Selection and operation of appropriate storage and materials handling equipment – general Contents ; Methods of stores layout to optimize the use of space and minimize picking costs; Outsourcing the activity and vendor managed inventory; Maintenance of security and prevention of theft; Storage and disposal of redundant, obsolete and scrap items; Environmental issues.

Unit 5: Management Aspects Health and Safety at work – operational issues: Health and Safety at work – management issues interdependence and teamwork; Relationships with other functions. Relevant Techniques Use of operational research techniques of queuing theory, network analysis, simple simulation techniques and decision trees; Identifying methods to distinguish between stores efficiency and effectiveness; Benchmarking and measurement of performance.

Basics of Business Process Re-engineering: Concept of BPR, process of BPR, application of BPR in productivity improvement.

Book References

1. Jessop and Morrison, Storage And Supply Of materials.
2. Duru C. Innocent, Purchasing And Stores Management, Ken Printing Press, Lagos.
3. Terry Lucey, Quantitative Techniques, Letts Educational, 5th Edition.

GBSRC MBA Syllabus

COURSE CODE	MB405J
COURSE TITLE	PROJECT MANAGEMENT
COURSE CREDITS	3

Course Description:

This course is designed to acquaint the students with the planning process in business and familiarize them with the project management. The students will get knowledge of various network techniques used in project management.

Course Objectives:

1. To familiarize students with the function and techniques of project management.
2. To acquaint students with Project co-ordination, Project audit and Project Termination.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
405J.1	Remember	STATE the importance and characteristics of project planning.
405J.2	Understand	DESCRIBE the concept of the Project Life-Cycle.
405J.3	Apply	MAKE USE OF various techniques for Improving the Process of Cost Estimation.
405J.4	Analyze	EXAMINE Project Audit Life Cycle.
405J.5	Evaluate	APPRAISE the network techniques for Project Audit Life Cycle.
405J.6	Create	CREATE a network diagram for any product.

Course Contents:

Unit 1:Project Planning

Introduction, Meaning, Definition, Characteristic and objective period, Nature of Planning, Importance of planning, Advantages of planning, Steps in planning process, Methods of planning.

Unit 2:The Project Life-Cycle

Project Management Maturity, Project Selection and Criteria of Choice, Types of Project Selection Models, Project Portfolio Process, Project Proposals. Project Management and the Project Manager, Problems of Cultural Differences, Impact of Institutional Environments, Project Organization, The Project Team.

Unit 3:Initial Project Coordination

The Nature of Negotiation, Partnering, Chartering and change, Conflict and the project life cycle. Estimating Project Budgets, Improving the Process of Cost Estimation.

Unit 4:Network Techniques

PERT and CPM, Risk Analysis Using Simulation with Crystal Ball 2000. Critical Path Method-Crashing a Project, The Resource Allocation Problem Resource Loading, Resource Leveling, Constrained Resource Allocation The Planning-Monitoring-Controlling Cycle, Information Needs

and the Reporting Process, Earned Value Analysis The Fundamental Purposes of Control, Three Types of Control Processes, Comments on the Design of Control Systems, Control as a Function of Management.

Unit 5: Purposes of Evaluation

Goals of the System, The Project Audit, Construction and Use of the Audit Report, The Project Audit Life Cycle, some Essential of an Audit/Evolution, The Varieties of Project Termination, when to Terminate a Project, The Termination Process.

Prescribed Books:

1. Prasanna Chandra, Project Planning, Analysis, Selection, Implementation and review.
2. Gopalkrishnan P and Ramamoorthy V.E., Textbook of project management.
3. Kemer Harold, Project Management.
4. Dennis Hock, Project Management Handbook.
5. Choudhary S., Project Management.

GBSRC MBA Syllabus

COURSE CODE	MB406J
COURSE TITLE	INNOVATION AND R AND D MANAGEMENT
COURSE CREDITS	3

Course Description :

This course aims to equip students with an understanding of the main issues in the management of technological innovation and an appreciation of the relevant skills needed to manage innovation at both strategic and operational levels. It provides evidence of different approaches based on real-world examples and experiences of leading international firms.

Course Objectives :

1. To understand the managerial aspects of Innovation functions.
2. To appreciate the Research and Development in management.
3. To evaluate the financial aspects of RandD projects.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
406J.1	Remember	DEFINE Introduction and Managerial aspects of Innovation function in management.
406J.2	Understand	DESCRIBE the various methods used in selection of R & D projects.
406J.3	Apply	IMPLEMENT Financial Evaluation of R and D Projects.
406J.4	Analyze	EXAMINE HRM issues in innovation and R and D.
406J.5	Evaluate	APPRAISE Measurement, Evaluation and assessment of R and D.
406J.6	Create	DESIGN organization structure for R & D.

Course Contents:

Unit 1: Introduction and Managerial aspects of Innovation function Introduction, Components of Innovation, Types of Innovations, Models of Innovation Processes, Evolution and characteristics of Innovation Management, Key drivers of Innovation, Factors influencing Innovation, Organizing for Innovation, Factors influencing organizational design, Developing Innovation Strategy, Characteristics of creative of creative organization.

Unit 2: Research and Development Management Introduction, Meaning, Objectives, Significance, Classification of RandD according to RandD type, process phase, measurement level, purpose of measurement and measurement perspective. Technology development approaches, Performance of RandD management in Indian scenario.

Unit 3: Financial Evaluation of RandD Projects Introduction, Cost effectiveness of RandD, RandD financial forecasts, Project selection, Evaluating RandD ventures, Conflicting views of managers. Allocation of resources, RandD programme planning and control. Project management, Project Planning and Control Techniques.

Unit 4: Organization RandD and innovation, HRM issues in innovation and RandD, Leadership and RandD management, Organization Design and structure of RandD, RandD Project Management, Measurement, Evaluation and assessment of RandD.

Unit 5: National RandD infrastructure and Institutional Framework, Fiscal and other incentives and Promotional /Support measures, Industry, Institutions and government cooperations. Other important issues in RandD management, Commercialization of RandD.

Project Quality Management: Concept of project quality, responsibility for quality in projects, quality management at different stages of project, tools and techniques, Quality Management Systems, TQM in projects.

References

1. White, The Management of Technology and Innovation-A Strategic Approach, Cengage Publication S Moikal, Innovation Management, Sage Publication.
2. C.K Prahalad and M.S. Krishnan, The New Age of Innovation, Tata McGraw Hill Education Pvt. Ltd. New Delhi 2008.

GBSRC MBA Syllabus

COURSE CODE	MB407J
COURSE TITLE	WORLD CLASS MANUFACTURING
COURSE CREDITS	3

Course Description:

World Class Manufacturing has focusing on standardization & global competitiveness. World Class Manufacturing is concerned with competitiveness of Indian manufacturing industry, manufacturing performance. The course focuses on the basic concepts related to Time based competition, managing knowledge Problems in manufacturing industry.

Course Objectives:

1. To understand the relevance of World Class Performance in competitive framework.
2. To understand global markets relationship to world class performance.
3. To build the framework for world class manufacturing.
4. To understand the status Indian manufacturing in relation to world class standards.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
407J.1	Remember	DEFINE the basic terms associated with Manufacturing Excellence and World Class Manufacturing.
407J.2	Understand	SUMMARIZE the features of various frameworks used for World Class Manufacturing.
407J.3	Apply	IDENTIFY the challenges to manufacturing industry in the information age.
407J.4	Analyze	EXAMINE the usage of Information management tools, Material processing and handling tools.
407J.5	Evaluate	APPRAISE the country's preparedness for World Class Manufacturing
407J.6	Create	ESTIMATE the performance of manufacturing firms with the measurement system to determine the readiness for World Class Manufacturing.

Course Outline:

Unit 1: World Class Manufacturing Introduction

Evolution of World Class Manufacturing (WCM). WCM and information age. Completing in information age business challenges operating environment of information age Indian global completeness and manufacturing excellent Time-based competition, Attribute of world class status.

Unit 2: Aspects of World Class Manufacturing

Gaining competitive advantage through world class manufacturing. Varies concepts of world class manufacturing Total Productivity through such practices: Kaizen, T.P.M, S.M.E.D., 5-S Principles, Housekeeping, the relevance of World Class Performance in competitive framework.

Unit 3: Tools for World Class manufacturing

Systems & Tools for World Class manufacturing, Overview of systems & tools Information management, MRP I & MRP II, Flexible manufacturing systems rapid prototyping, Problem

solving tools such as: TQC Tools – problem solving.

Unit 4: Competitiveness

Competitiveness of Indian manufacturing. Business strategy & global competitiveness. World Class Strategic planning and Implementation, Need for performance measurement, Importance of Human diversions in world class- morale and team building. International Certifications for standardization, global markets relationship to world class performance.

Unit 5: Leading Towards World Class Manufacturing: The Indian Scenario

Leading India towards world class manufacturing. Strategy for world class status, and information technology. Case studies on Indian manufacturing.

Prescribed Book:

1. Chronicles of a Quality Detective by Shrinivas Gondhalekar and Payal Sheth.
2. World Class Manufacturing by K. Shridhara Bhat, Himalaya Publications.
3. World Class Manufacturing by Richard J. Schonberger, publisher-Simon and Schuster.

Suggested Readings:

1. Operations Management for competitive advantage, Chase, Jacobs, Aquilano and Agarwal, TMGH, 13th Edition.
2. Production & Operations Management, Shailendra Kale, McGraw Hill Publications.

GBSRC MBA Syllabus

BUSINESS ANALYTICS SPECIALIZATION

COURSE CODE	MB401K
COURSE TITLE	CASES IN MANAGEMENT (BUSINESS ANALYTICS)
COURSE CREDITS	3

Course Description:

The course aims to get the students thinking and discussing issues pertaining to management drawing on what they already know. To increase awareness and knowledge of contemporary management issues and to allow students the opportunity to discuss and critically analyse source materials, in order to both enhance their understanding of the topics and to practice their analytical and debating skills.

Course Objectives:

1. To give students the confidence and experience of debating issues on the managerial command.
2. To give exposure exposure of real life Business situation and decision making with the best possible use of resources.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
401K.1	Remembering	DESCRIBE the major theories, concepts, terms, models, frameworks and research findings in the field of Business Analytics.
401K.2	Understanding	SUMMARIZE the impact of Current Business Analytics trends on Business Analytics Functions
401K.3	Applying	MAKE USE OF the Theories, Models, Principles and Frameworks of Business Analytics in analysing the cases of Business Analytics
401K.4	Analysing	ATTRIBUTING the Business Analytics Case with reference to Theories, Models, frameworks of Business Analytics
401K.5	Evaluating	TEST a given Case of Business Analytics with reference to the Current Trends, Best Practices in Business Analytics
401K.6	Creating	CONSTRUCT a Case on any one of the given Business Analytics Concepts or Problem or Scenario

Course Outline:

To facilitate student learning, a range of source materials will be used throughout the course to direct and stimulate discussion, course will be having five case studies from the contemporary topics of the specializations of management students which is to be discussed in the class room by respective subject faculty. Students are also encouraged to put forward their own ideas for sessions, and to contribute source materials where appropriate to increase engagement in, and relevance of, the course for students. Case analysis and presentations will be an integrate part of learning case

studies.

CASES IN MANAGEMENT (BUSINESS ANALYTICS)

1. Five cases to be discussed analyzed and presented from the following topics.
2. Following are the suggested topics however are not limited and open for contemporary topics.
 1. Personalized Marketing
 2. Customer Segmentation
 3. Life Value Prediction
 4. Customer sentiment Analysis
 5. Real Time Analytics
 6. Predictive Analysis
 7. Market Basket Analysis
 8. Transactional Analytics
 9. Price Optimization
 10. Detecting insurance fraud

GBSARC MBA Syllabus

COURSE CODE	MB402K
COURSE TITLE	ARTIFICIAL INTELLIGENCE IN BUSINESS APPLICATIONS
COURSE CREDITS	3

Course Description:

Artificial intelligence is already widely used in business applications, including automation, data analytics, and natural language processing. Across industries, these three fields of AI are streamlining operations and improving efficiencies. Automation alleviates repetitive or even dangerous tasks. Data analytics provides businesses with insights never possible. Natural language processing allows for intelligent search engines, helpful chatbots, and better accessibility for people who are visually impaired.

Course Objectives:

1. To Identify Knowledge associated and represent it by logical sequence and plan a strategy to solve given problem.
2. To understand AI's fundamental concepts and methods.
3. To apply various machine learning algorithms on structured data to develop machine learning models.
4. To acquire advanced Data Analysis Skills through algorithm and search processes.
5. To select logical and functional process to develop the model.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
402K.1	Remembering	IDENTIFY KNOWLEDGE associated and represent it by logical sequence and plan a strategy to solve given problem
402K.2	Understanding	UNDERSTAND AI's fundamental concepts and methods.
402K.3	Applying	APPLY various machine learning algorithms on structured data to develop machine learning models.
402K.4	Analysing	ACQUIRE advanced Data ANALYSIS SKILLS through algorithm and search processes.
402K.5	Evaluating	SELECT logical and functional process to develop the model
402K.6	Creating	CREATE SOLUTIONS for various business problems using AI techniques.

Course Outline:

Unit 1: Introduction to AI and Programming Tools

Analytics Landscape, Complexity of Analytics, What is Artificial Intelligence ? Embedding AI into Business Processes, Basic Concepts of Artificial Intelligence Brain Science and Problem Solving, The History of AI, Benefits of AI Data Pyramid Property of Autonomy, The AI Revolution, Business Innovation with Big Data and Artificial Intelligence. AI and Predictive

Analytics, Overlapping of Artificial Intelligence with Other Fields Ethics and Privacy Issues, Application Areas, AI and Society. Knowledge-Based Systems Knowledge Based Reasoning: Agents, Facets of Knowledge.

Unit 2: Logic and Inferences

Formal Logic, Propositional and First Order Logic, Resolution in Propositional and First Order Logic, Deductive Retrieval, Backward Chaining, Second order Logic. Knowledge Representation: Conceptual Dependency, Frames, Semantic nets. Reasoning Systems for Categories, Reasoning with Default Information. Propositional Logic & Predicate logic - Syntax., Semantics, Computability and Complexity Applications and Limitations, Logic for Problem solving, Logic Programming with PROLOG, PROLOG Systems and Implementations, Execution Control and Procedural Elements, Constraint Logic Programming, Simple Examples.

Unit 3: Problem Solving, Search and Game Techniques

Problem solving with AI, Study and analysis of various searching algorithms, Local Search in Continuous Spaces, Searching with Non-deterministic Actions General Problem Solver, Gelernter's Geometry Theorem, STRIPS, ABSTRIPS, Search - Overview, Problem representation State-space representation. Games with Opponents- Minimax Search, Alpha-Beta-Pruning Non-deterministic Games. Heuristic Evaluation Functions Game trees, optimal search for an optimal solution. Conditions for optimality: Admissibility and consistency, Optimality.

Unit 4: Machine Learning and Data Mining

Introduction - What is machine learning ? Supervised vs. Unsupervised learning, Reinforcement Learning. Machine Learning Workflow, Learning Algorithms, Linear Regression k-Nearest Neighbour , Decision Trees, Feature Construction and Data Reduction ,Random Forest, k-Means Algorithm, Gradient Boosting, Auto encoders, Data Analysis, The Perceptron, a Linear Classifier, The Learning Rule, Optimization and Outlook , The Nearest Neighbour Method, Two Classes, Many Classes, Approximation, Case-Based Reasoning, Decision Tree Learning, Entropy as a Metric for Information Content, Cross-Validation and Over fitting, Learning of Bayesian Networks, Learning the Network Structure, The Naive Bayes Classifier, Clustering ,Hierarchical Clustering, Data Mining in Practice.

Unit 5: Introduction to Natural language processing

Introduction to Natural Language Processing, Stages in NLP, NLP Models, Morphological Processing - Syntax and Semantics, Text Analytics, Sentiment Analysis, Syntactic Analysis (Parsing), Semantic interpretation, Discourse and pragmatic Processing, Text Classification, Implementation aspects of Syntactic Analysis (Parsing), Application of NLP in Machine Translation, Information Retrieval and Big Data Information Retrieval. Learning: Supervised, Unsupervised and Reinforcement learning. Use Cases of NLP, Applications of NLP in Business Customer Service, Reputation Monitoring. Market Intelligence, Sentiment Technology in Business.

Prescribed Books:

1. Introduction to Artificial Intelligence by Wolfgang Ertel, Springer, Translated by Nathanael Black.

2. Artificial Intelligence by Elaine Rich, Kevin Knight and Nair, TMH.
3. A First Course in Artificial Intelligence by Deepak Khemani, McGraw Hill Education (India).

Suggested Reading:

1. Artificial Intelligence: A Modern Approach by Stuart Russell and Peter Norvig, Pearson
2. Artificial Intelligence by Saroj Kausik, Cengage Learning

GBSRC MBA Syllabus

COURSE CODE	MB403K
COURSE TITLE	SUPPLY CHAIN ANALYTICS
COURSE CREDITS	3

Course Description:

Analytics of the supply chain refers to the methods used by companies to obtain knowledge and derive value from the vast quantities of information related to the procurement, manufacturing, and delivery of products. Analysis of the supply chain is an integral part of supply chain management (SCM).

Course Objectives:

1. To describe the importance of the basics of Supply Chain Analytics and Optimization.
2. To explain the role and applications of Descriptive, Predictive & Prescriptive Analytics in a Supply Chain.
3. To illustrate the basics of Modeling through R Language.
4. To examine the level of uncertainty associated with the supply of products and services to targeted customer segments and justify the choice of a supply chain strategy and its fit with competitive strategy.
5. To determine and Design the right tools for addressing various issues in Supply Chain Analytics.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
403K.1	Remembering	DESCRIBE the importance of the basics of Supply Chain Analytics and Optimization.
403K.2	Understanding	EXPLAIN the role and applications of Descriptive, Predictive & Prescriptive Analytics in a Supply Chain
403K.3	Applying	ILLUSTARTE the basics of Modelling through R Language
403K.4	Analysing	EXAMINE the level of uncertainty associated with the supply of products and services to targeted customer segments and justify the choice of a supply chain strategy and it's fit with competitive strategy.
403K.5	Evaluating	DETERMINE the right tools for addressing various issues in Supply Chain Analytics
403K.6	Creating	COMBINE the various approaches to Supply Chain Analytics for improvements in the supply chain system

Course Outline:

Unit 1: Context of Supply Chain Analytics

Context of today's supply chains (SC) analytics Understanding and defining supply chain analytics (SCA). Review of Basics of Supply Chain Management, Significance of Analytics in a supply chain, Relating Operations Management with Supply Chain concepts and SC Analytics.

The importance of supply chain analytics in the flows involving material, money, information, and ownership. Key issues in Supply chain analytics, Case studies of Supply Chains Analytics in India.

Unit 2: Supplier Selection Analytics

Linear Programming, Rating method, Ranking method, Borda Count, Clustering, Goal Programming and related multi-criterion decision making (MCDM) techniques.

Unit 3: Transportation Modelling and Analytics

Transportation models, Route planning, Transshipment, Shipment schedule, Flow path optimization.

Unit 4: Warehousing Modeling and Analytics

Warehouse location problem, MILP formulation, Location with foreign exchange risks, space calculation for warehouse, Non-linear optimization for warehouse space allocation.

Unit 5: Strategic Performance Improvement

Data Envelopment Analysis for competitive comparisons among multiple warehouses and service units and formulation of strategic action plans for improving the efficiencies of non-performing DMUs, Stochastic Frontier Analysis.

Prescribed Books:

1. Unleashing the Potential of Supply Chain Analytics by Melissa R. Bowers, Adam Petrie and Mary C. Holcomb, O'Reilly.
2. Modeling the Supply Chain, Jeremy F. Shapiro, Duxbury Thomson Learning.
3. Supply Chain Management, Sunil Chopra, and Peter Meindl, Pearson.
4. Business Analytics, Rahul Saxena and Anand Srinivasan.

Suggested Reading:

1. Designing and Managing the Supply Chain concepts, Strategies and Case studies, D. Simchi-Levi, P. Kaminsky, E. Simchi-Levi, and Ravi Shankar, Tata McGraw Hill, New.
2. Global Business Analytics Models: Concepts and Applications in Predictive, Healthcare, Supply Chain, and Finance Analytics by Hoey Min.
3. Supply Chain Planning and Analytics by Gerald Feigin.

COURSE CODE	MB404K
COURSE TITLE	DATA VISUALISATION FOR MANAGERS
COURSE CREDITS	3

Course Description :

As big data gets bigger, managing it in the cloud is an increasingly popular IT strategy. The power and flexibility of cloud services allow organizations to harness and analyze their data more efficiently. System administrators, IT managers and other data professionals who understand cloud storage and analytics technologies are becoming valuable assets for businesses of all sizes.

Course Objectives:

1. To study key aspects of data security, synchronization and protection.
2. To compare storage, database and big data solutions provided by the major cloud vendors.
3. To study technical concepts that include data models, cloud architecture, scalable analytics administration, data visualization and relational query processing.
4. To know strategies for working with and analyzing unstructured data.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
404K.1	Remembering	The students will be able to DESCRIBE basic concepts of data visualization.
404K.2	Understanding	The students will be able to DEMONSTRATE understanding by working on various Machine learning tools.
404K.3	Applying	The students will be able to APPLY Hive to query Hadoop files.
404K.4	Analysing	The students will be able to ASCERTAIN Hadoop, SQL Querying.
404K.5	Evaluating	The students will be able to EVALUATE big data.
404K.6	Creating	The students will be able to SETUP the demo environment with Hadoop

Course Contents:

Unit 1: Introduction to Cloud Computing

The Evolution of the Cloud, Definition, various Cloud Services, Attributes, User- System Interface, Characteristics of Cloud Computing, Five Levels of Redundancy, Cloud Categories, Cloud Delivery Models, Emerging Technology, vendor Choices, Infrastructure Limitations, Negligence, Cloud Scenarios and Considerations.

Unit 2: Security in the Cloud

Data Security and Control, Cloud Threats, Threat Mitigation, Cloud Security, Data Confidentiality and Privacy Service Availability, Cloud Risk Summary, Real World Issues with Cloud Computing, Cloud Security Alliance, National Institute of Standards and Technology, Cloud Computing and Business Commerce, Cloud Management Audit/Assurance Program, Cloud Business Continuity Planning, Determining the Cloud Category.

Unit 3: Big Data introduction

Big data: definition and taxonomy - Big data value for the enterprise - Setting up the demo environment - First steps with the Hadoop –ecosystem.

Unit 4: Querying big data with Hive

Introduction to the SQL Language - From SQL to HiveQL, Introduction to HIVE e HIVEQL - Using Hive to query Hadoop files.

Unit 5: Big data and Machine learning

Quick into to Machine learning - Big Data and Machine Learning - Machine learning tools 1) Spark and SparkML 2) H2O 3) Azure ML, Next steps in the big data world.

Prescribed Books:

1. Big data. Architettura, tecnologie e metodi per l'utilizzo di grandi basi di dati, A. Rezzani, Apogeo Education, 2013.
2. Hadoop For Dummies, Dirk deRoos, For Dummies, 2014.

GBSRC MBA Syllabus

COURSE CODE	MB405K
COURSE TITLE	SECURITY AND MASTER DATA MANAGEMENT
COURSE CREDITS	3

Course Description:

High-quality, low-redundancy reference data is essential in business today. Customer relationship management (CRM) without customer data integration is difficult. Effective supply chain management is equally difficult without integrated product, supplier and partner data.

Course Objectives:

1. To understand the concepts and terminology of MDM.
2. To understand the architectural options for MDM-implementation.
3. To understand the elements and activities of building an MDM- business case.
4. To understand the important role of related disciplines such as data governance and data quality.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
405K.1	Remembering	The students will be able to DETERMINE Data Profiling and related techniques.
405K.2	Understanding	The students will be able to UNDERSTAND master data management, its sources and consequences of poor data master data
405K.3	Applying	The students will be able to APPLY parsing and standardization for data.
405K.4	Analysing	The students will be able to ANALYZE data quality.
405K.5	Evaluating	The students will be able to FORMULATE & handle Master Data Management.
405K.6	Creating	The students will be able to DESIGN & implementation of Data Matching tools and Techniques.

Course Contents:

Unit 1: Security Management Practices

Overview of Security Management, Information Classification Process, Security Policy, Risk Management, security Procedures and Guidelines, Business Continuity and Disaster Recovery, Ethics and Best Practices.

Unit 2: Introduction

What is Master Data Management ? What Is Master Data ? Sources of Master Data, Poor Master Data Consequences, Why is Master Data Management So Difficult ? Types of Master Data Managed.

Unit 3: Introduction to Data Profiling

What is Data Profiling ? Myth and Reality of Data Profiling, Profiling Techniques, Profiling Challenges, Role of Profiling, People and Technology.

Unit 4: Implementation Fundamentals

Parsing and Standardization, Introduction to Data Matching, Data Matching Techniques, Data Matching Destinations, Evaluating Data Matching Tools.

Unit 5: MDM Architecture

Architecture Approaches, Conforming Dimensions for the Enterprise, Business Process Workflows, Data Quality, Data Quality Case Example, Syndicated Data o Architecting Syndicated Data.

Prescribed Books:

1. Information Security Management - CISSP. HaroldF.Tipton.
2. Information Security: The Complete Reference – MarkRhodes-Ousley.

GBSARC MBA Syllabus

COURSE CODE	MB406K
COURSE TITLE	INTERNET OF THINGS
COURSE CREDITS	3

Course Description :

The concept of Internet of Things (IoT), has begun to make an impact in industries ranging from industrial systems to home automation to healthcare. Researchers continue to conduct ground-breaking research on topics ranging from RFID to cloud technologies, from sensors to the World Wide Web.

Course Objectives:

1. To learn vision and Introduction to IoT.
2. To understand IoT Market perspective.
3. To learn data and Knowledge Management and use of Devices in IoT Technology.
4. To understand State of the Art – IoT Architecture.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
406K.1	Remembering	The students will be able to DEFINE the impact of the Internet of Things on society and everyday life.
406K.2	Understanding	The students will be able to IDENTIFY important characteristics of IoT platforms and user interfaces.
406K.3	Applying	The students will be able to ILLUSTRATE business processes in IoT
406K.4	Analyzing	The students will be able to ASCERTAIN and ANALYZE IoT security and privacy risks, and concept design secure hardware and software.
406K.5	Evaluating	The students will be able to EVALUATE IoT architecture
406K.6	Creating	The students will be able to DESIGN IoT solutions through gaining a deep appreciation of the IoT concepts.

Course Contents:

Unit 1: M2M to IoT

The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics.

Unit 2: M2M to IoT – A Market Perspective

Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. M2M to IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture Contents, standards considerations.

Unit 3: M2M and IoT Technology Fundamentals

Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management.

Unit 4: IoT Architecture-State of the Art

Introduction, State of the art, Architecture Reference Model- Introduction, Reference Model and architecture, IoT reference Model.

Unit 5: IoT Reference Architecture

Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. Real-World Design Constraints- Introduction, Technical Design constraints-hardware is popular again, Data representation and visualization, Interaction and remote control. Industrial Automation- Service- oriented architecture-based device integration, SOCRADES: realizing the enterprise integrated Web of Things, IMC-AESOP: from the Web of Things to the Cloud of Things, Commercial Building Automation- Introduction, Case study: phase one-commercial building automation today, Case study: phase two- commercial building automation in the future.

Prescribed Books:

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatias Karnouskos, David Boyle, “From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”, 1st Edition, Academic Press, 2014.
2. Vijay Madiseti and Arshdeep Bahga, -Internet of Things (A Hands-on-Approach), 1st Edition, VPT, 2014.
3. Francisda Costa, -Rethinking the Internet of Things: A Scalable Approach to Connecting Everything, 1st Edition, Apress Publications, 2013

GBSRC MBA Syllabus

COURSE CODE	MB407K
COURSE TITLE	SOCIAL MEDIA, WEB & TEXT ANALYTICS
COURSE CREDITS	3

Course Description:

Social media analytics helps to understand contents that drive more user acceptance. In this way, you get to know which post had more positive views and then improve on that line of content. Platforms like twitter and Facebook have built-in analytics that shows you how well your posts perform. Website analytics provide insights and data that can be used to create a better user experience for website visitors. With website analytics, you can also accurately track the effectiveness of your online marketing campaigns to help inform future efforts. Text analytics is the automated process of translating large volumes of unstructured text into quantitative data to uncover insights, trends, and patterns.

Course Objectives:

1. To define the key terms in Social Media Analytics, Web Analytics and Text Analytics.
2. To learn the applications of Social Media Analytics, Web Analytics and Text Analytics in multiple business domains and scenarios and to develop a thought process to harness the power of social media analytics to improve website or business.
3. To analyze & select the right metrics the Social Media Analytics and Web Analytics Tools.
4. To combine various tools and metrics in building high impact dashboard in multiple business domains and scenarios.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
407K.1	Remembering	DEFINE the key terms in Social Media Analytics, Web Analytics and Text Analytics
407K.2	Understanding	EXPLAIN the applications of Social Media Analytics, Web Analytics and Text Analytics in multiple business domains and scenarios
407K.3	Applying	DEVELOP a thought process to harness the power of social media analytics to improve website or business
407K.4	Analysing	ANALYSE Social Media Analytics and Web Analytics Tools
407K.5	Evaluating	SELECT the right metrics for Social Media Analytics and Web Analytics
407K.6	Creating	COMBINE various tools and metrics in building high impact dashboard in multiple business domains and scenarios

Course Outline:

Unit 1: Social Media Overview: Social Media Introduction, definition, evolution, need of social media, Importance of Social Media, Social Media Data Sources, Use of Social Media in Business, Objective and KPIs, Measure, Content flow on Social Network, Challenges, Tools to analyse and measure social data (Facebook, Twitter, Instagram, LinkedIn, YouTube), Social Analytics and

competitors, Strategy planning in Social Media Analytics.

Unit 2: Social Analytics- Measuring Success: Metric categories: Divide and Conquer, Selecting the best metrics for the job, Default and Custom Metrics, Elements of effective metrics, Metrics and Strategy. Estimated Metrics: Use and Common applications, Dashboards: Definition, Purpose, Objectives, default and custom dashboards, Reports: elements of reporting, good quality of reporting, 360 overview report, Data gathering in social Media Analytics, Types of Analytics in Social Media, Charts, Machine learning in Social Media.

Unit 3: Web Analytics Overview: Introduction to Web Analytics, Web Analytics 2.0, Elements of Web Analytics 2.0: Clickstream, Multiple Outcomes, Experimentation and Testing, Voice of Customer, Competitive Intelligence, Choosing the right web analytic tool, Critical Web Metrics- Visits and Visitors, Time on Page and Time on Site, Bounce Rates, Exit Rates, Conversion Rates, and Engagement, Attributes of Great Metrics, Web Metrics Lifecycle Process.

Unit 4: Web Analytics - Measuring Success: Actionable Outcome KPIs-Task completion Rate, Share of Search, Visitor Loyalty and Recency, RSS/Feed Subscribers, % of Valuable Exits, Cart and Checkout Abandonment, Days and Visits to Purchase, Average Order Value, Identify the Convertible, Measuring Macro and Micro Conversions, Building the action Dashboard, Consolidated Dashboard, Rules for High-Impact Dashboard.

Unit 5: Text Analytics: Introduction to text Analytics, Processing and Understanding Text - Tokenization, Tagging Chunking, Stemming, Lemmatization and Applications of Text Analytics.

Prescribed Books:

1. Social Media Marketing Step by Step: The Guides to Instagram and Facebook Marketing- Bryan Bren.
2. Social Media Analytics Strategy: Using data to optimize Business Performance – Alex Goncalves.
3. Effective Advertising and Social Media: Strategy and Analytics – Gerard Tellis.
4. Social Media Metrics: How to Measure and Optimize Your Marketing Investment by Jim Sterne, John Wiley & Sons.

Suggested Reading:

1. Web Analytics 2.0: The Art of Online Accountability and Science of Customer Centricity by Avinash Kuashik.
2. Web Analytics Action Hero: Using Analysis to Gain Insight and Optimize Your Business by Brent Dykes.

COURSE CODE	MB408
COURSE TITLE	BUSINESS ETHICS
COURSE CREDITS	1

Course Description :

The core of a successful management lies in its Clarity of Vision, Plan of Action and more importantly Execution of the Plan of Action – the real gamut of operations as it were, and it is here that the importance of Corporate Governance and Ethics comes into being. The purpose of this course is to strengthen the ability to anticipate, critically analyze, appropriately respond to, and provide leadership regarding, ethical issues students will confront as employees and eventually as managers of people, projects and enterprises.

Course Objectives:

1. To apply general ethical principles to particular cases and practices in business.
2. To think independently and rationally about contemporary moral problems.
3. To recognize the complexity of problems in practical ethics.
4. To demonstrate how general concepts of governance apply in a situation or given circumstance.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom's Level	Course Outcomes
408.1	Understanding	The students will be able to ACQUIRE a basic and clear understanding of philosophical ethics.
408.2	Understanding	The students will be able to UNDERSTAND the principles of moral decision-making in global business.
408.3	Remembering	The students will be able to IDENTIFY the trade-offs that face an ethical Manager faces.
408.4	Analyzing	The students will be able to ANALYSE the concept of corporate social responsibility & how competitive advantage maps on to corporate social responsibility.
408.5	Remembering	The students will be able to IMPROVE presenting and evaluating arguments in both oral and written formats.
408.6	Evaluating	The students will be able to EXAMINE and discuss competing positions on a range of issues facing business and society.

Course Contents:

Unit1: Business Ethics: An Overview

What is Business Ethics? Principles of Personal and Professional Ethics, Entrepreneur Vs Professional Managers, Values and Ethics in Business, Changing Business Environment and Ethical Challenges.

Unit 2: Ethical Dilemmas and Ethical Decision-making

What is Ethical Dilemma ? How to resolve Ethical Dilemmas ? The process of making good ethical decisions.

Unit 3: Gandhian Philosophy of Wealth Management-

Philosophy of Trusteeship, Gandhiji's Seven Greatest Social Sins.

Unit 4: Corporate Social Responsibility-

Social Responsibility of business with respect to different stakeholders, Arguments for and against Social responsibility of business, Social Audit.

Unit 5: Globalization and Business Ethics

International Business issues, Key Global issues for Business, Ethics and Indian Business, WhistleBlowing.

Prescribed Textbook:

1. Business Ethics in India -An Indian Perspective by A.C.Fernando, Pearson Publication 2nd Edition.

Reference Books:

1. Corporate Governance in India-An evaluation by S.C.Das, PHI Eastern Economy Edition.
2. Business Ethics-An Indian Perspective by Ronald Francis and Mukti Mishra, TMGH.

GBSRC MBA Syllabus

COURSE CODE	MB409
COURSE TITLE	DESIGN THINKING
COURSE CREDITS	3

Course Description:

Design thinking refers to the cognitive, strategic and practical processes by which design concepts (proposals for products, buildings, machines, communications, etc.) are developed. Design thinking is also associated with prescriptions for the innovation of products and services within business and social contexts. Design thinking encompasses processes such as context analysis, problem finding and framing, ideation and solution generating, creative-thinking, sketching & drawing, modelling and prototyping, testing and evaluating.

Course Objectives:

1. To understand the fundamentals of Design Thinking for innovation.
2. To learn how to be both analytical and creative in order to generate solutions for challenging problems.
3. To instil the innovative and creative methods to solve ‘wicked problems’.

Course Outcomes: On successful completion of the course the students will be able to

CO No.	Bloom’s Level	Course Outcomes
409.1	Remembering	DEFINE a Key term in Design Thinking
409.2	Understanding	EXPLAIN Design Thinking Approach
409.3	Applying	APPLY the Empathy to Action and Defining the problem
409.4	Analysing	ANALYSE Design Thinking Tools and Methods for solving various problems
409.5	Evaluating	EVALUATE the Solutions and implementation and Measurement of solution

Course Outline:

Unit 1: Introduction to Design Thinking

Definition and nature of Design Thinking Methodology, Objectives and Scope of Design Thinking, Phases of Design Thinking Process.

Unit 2: Design Thinking Approach

Fundamental Concepts, the concept of empathy in the context of design thinking, the concept of ethnography in the context of design thinking, the concept of divergent thinking within the context of design thinking, mind mapping as a means to facilitate design thinking projects, brainstorming as a means to facilitate design thinking projects, concept development as a means to facilitate design thinking projects.

Unit 3: Empathy to Action and Defining the problem

Key rules to empathise, identifying assumptions and bias, empathy and contextual interviews, stakeholder map, shadowing, mind maps, empathy maps, storyboarding customer experience.

Identifying user needs, creating personas, prioritisation grid, creating goals from pain points.

Unit 4: Design Thinking Tools and Methods

Need to use tools and methods, visualization as a means to facilitate design thinking, assumption testing as a means to facilitate design thinking, rapid prototyping as a means to facilitate design thinking, customer co-creation as a means to facilitate design thinking, Design Thinking Application.

Unit 5: Testing Solutions and implementation and Measurement of Solution

Need of Testing, Testing Methods, Cognitive Walkthrough, Getting Best Feedback from Testing, Implementation, System Thinking, Pitching- Storytelling for success, converting minimum viable product to a measurable solution.

Prescribed Books:

1. Marc Stickdorn- This Is Service Design Methods: Expanded Service Design Thinking Methods for Real Projects.
2. The Design of Business: Why Design Thinking is the Next Competitive Advantage, by Roger L. Martin.
3. Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation, by Tim Brown.
4. Creative Workshop: 80 Challenges to Sharpen Your Design Skills, by David Sherwin.

Suggested Readings:

1. Jeanne Liedtka, Tim Ogilvie, and Rachel Brozenske, The Designing for Growth Field Book: A Step-by Step Project Guide (New York: Columbia University Press, 2014).
2. Jeanne Liedtka and Tim Ogilvie, Designing for Growth: A Design Thinking Tool Kit for Managers (New York: Columbia University Press, 2011) (referred to below as Designing for Growth).
3. Pawan Soni- Design your Thinking.

Ref. No. DYPMC/NAAC/354/2023

Date: 25/10/2023

Crosscutting issues relevant to Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging demographic changes and Professional Ethics integrated in the curricula.

Sr. No.	Name of the Program	Name of the Course	Relevance to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values (Choose the appropriate option)	Description of activities related to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values
1	MBBS Undergraduate	Human Anatomy	Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each undergraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Physiology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each undergraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.

Dr. J.S. Bhawalkar

Dean

Dr. D.Y. Patil Medical College,
Hospital & Research Centre,
Pimpri Pune - 411018

		Biochemistry	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each undergraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Pathology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each undergraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Pharmacology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each undergraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Otolaryngorhinology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each undergraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational

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				seminar & competitions, case presentations and cultural activities.
		Obstetrics and Gynaecology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each undergraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Orthopedics	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each undergraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Anesthesiology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each undergraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Radiology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each undergraduate learn about profession ethics, human values, gender equality, health determinants through peer

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				interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Emergency Medicine	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each undergraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
2	MD/MS Postgraduate	Gross Anatomy	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Embryology, Microscopic Anatomy and Genetics	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Neuroanatomy	Gender/ Environment & Sustainability / Health determinants/ Emerging	Each postgraduate learn about profession ethics, human values, gender

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			demographic changes/ Ethics/ Human values	equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Applied Human Anatomy and recent advances in anatomical Sciences	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		General and Cellular Physiology including Genetic Basis and Historical perspectives:	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Systemic Physiology (system providing transport, nutrition and energy) including comparative Physiology.	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.

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		Systemic Physiology (system concerned with procreation, regulation and neural control)	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Applied Physiology including recent advances	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Biomolecules, cell biology, biochemical techniques, biostatistics and research methodology, basics of medical education in teaching and assessment of biochemistry	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Enzymes, bioenergetics, biological oxidation, metabolism of biomolecules, intermediary metabolism and regulation, inborn errors of metabolism and nutrition	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions,

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				case presentations and cultural activities.
		Molecular biology, molecular and genetic aspects of cancer, immunology and effects of environmental pollutants on the Body	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Clinical biochemistry and molecular diagnostics related to different body systems/organs, endocrinology, and recent advances in biochemistry	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Clinical and other Basic Sciences as related to Pharmacology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		General & Systemic Pharmacology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group

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				activates, educational seminar & competitions, case presentations and cultural activities.
		Experimental & Clinical Pharmacology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Recent Advances in Pharmacology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		General Pathology, Pathophysiology, Immunopathology and Cytopathology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Systemic Pathology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/	Each postgraduate learn about profession ethics, human values, gender equality, health

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			Ethics/ Human values	determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Haematology, Transfusion Medicine (Blood Banking) and Laboratory Medicine	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Recent advances and applied aspects	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Basic Sciences & General Bacteriology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.

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		Systemic Bacteriology including Related Recent Advances	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Immunology & Parasitology including Related Recent Advances	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Virology, Mycology including Related Recent Advances	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Basic sciences as applied to Community Medicine	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions,

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				case presentations and cultural activities.
		Public Health Administration & Management Sciences	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Community Medicine & FamilyPractice	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Recent Advances in CommunityMedicine	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Basic Medical Sciences	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group

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				activates, educational seminar & competitions, case presentations and cultural activities.
		Medicine and allied specialties including pediatrics, dermatology & psychiatry	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Tropical Medicine and Infectious Diseases	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Recent Advances in Medicine	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		General pulmonary medicine and basic sciences;	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/	Each postgraduate learn about profession ethics, human values, gender equality, health

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			Ethics/ Human values	determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Clinical pulmonary medicine including medical emergencies;	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Clinical pulmonary medicine including critical care medicine;	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Recent advances in pulmonary medicine, and research methodology.	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.

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		Basic sciences as applied to Paediatrics	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Neonatology and community Paediatrics	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		General Paediatrics including advances in Paediatrics relating to Cluster I Specialties	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Paediatric Medicine including advances in Paediatrics relating to Cluster II specialties	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions,

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				case presentations and cultural activities.
		Basic Sciences as related to Psychiatry	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Clinical Psychiatry	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Psychiatric theory and Psychiatric specialties	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Neurology and General Medicines related to Psychiatry	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group



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				activates, educational seminar & competitions, case presentations and cultural activities.
		Applied basic sciences related to dermatology, venereology and leprosy	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		General dermatology including skin manifestations of systemic and venereal diseases	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Tropical dermatology including social aspects of venereal diseases and leprosy Essays	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Therapeutics, Dermatotomy and Recent advances in dermatology, venereology and leprosy	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/	Each postgraduate learn about profession ethics, human values, gender equality, health

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			Ethics/ Human values	determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Emergency Medicine Basic Sciences	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Medicine & Allied Subjects	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Surgery & Allied Subjects	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Recent Advances in EmeegncyMedicine	Gender/ Environment & Sustainability / Health	Each postgraduate learn about profession ethics,

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			determinants/ Emerging demographic changes/ Ethics/ Human values	human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		General Surgery: Basic Sciences	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Principles and Practice of Surgery	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Principles and practice of Operative Surgery	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.

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		Recent Advances in Surgery	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Basic Sciences related to Ophthalmology, Refraction & Optics	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Clinical Ophthalmology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Systemic Diseases in Relation to Ophthalmology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions,


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				case presentations and cultural activities.
		Recent Advances in Ophthalmology and Community Ophthalmology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Basic Sciences related Otolaryngology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Principles and Practices of Otolaryngology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Recent advances in Otolaryngology and Head Necksurgery.	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group

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				activates, educational seminar & competitions, case presentations and cultural activities.
		General Surgical Principles and Head-Neck Surgery.	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Applied Basic sciences in Obstetrics and Gynecology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Obstetrics including social obstetrics and Diseases of NewBorn	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Gynaecology including fertility regulation	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/	Each postgraduate learn about profession ethics, human values, gender equality, health

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			Ethics/ Human values	determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Recent Advances in Obstetrics & Gynaecology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Basic Sciences as applied to Orthopaedics	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Traumatology and Rehabilitation	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Orthopaedic diseases	Gender/ Environment & Sustainability / Health	Each postgraduate learn about profession ethics,

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			determinants/ Emerging demographic changes/ Ethics/ Human values	human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Recent advances in Orthopaedicsurgery + General Surgery as applied to Orthopaedics	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Basic Sciences as applied to Anaesthesiology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Practice of Anaesthesia: Anaesthesia in relation to associated systemic and medical diseases.	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.

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		Anaesthesia in relation to subspecialties/superspecialties	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Intensive Care Medicine, Pain Medicine and Recent advances.	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Basic sciences related to Radiology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Chest, CVS, CNS including Head& Neck, Eye, ENT, musculo-skeletal, pediatric radiology and Mammography.	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions,

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				case presentations and cultural activities.
		Abdominal Imaging including GI, GU, Hepatobiliary, endocrine and metabolic, Obstetrics and Gynaecology and Interventional radiology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
		Recent advances, nuclear medicine; Radiology related to clinical Specialties	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each postgraduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activates, educational seminar & competitions, case presentations and cultural activities.
3	M.CH/DM Super speciality	Basic Sciences as related to NeuroSurgery	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Clinical Neuro Surgery	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions,

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				group activities, educational seminar & competitions, case presentations.
		Operative Neuro Surgery	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Recent advances in Neuro Surgery	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Basic Sciences as related to Urology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Clinical Urology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/	Each super speciality graduate learn about profession ethics, human values, gender equality,

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			Ethics/ Human values	health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Operative Urology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Recent advances in Urology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Basic Sciences as applicable to Nephrology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Clinical Nephrology Part I	Gender/ Environment & Sustainability / Health	Each super speciality graduate learn about

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			determinants/ Emerging demographic changes/ Ethics/ Human values	profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Clinical Nephrology Part II	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Recent advances in Nephrology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Basic science and general Cardiology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.

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		Coronary artery disease	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Hemodynamics, Therapeutics and intervention	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Other C.V. disease and Recentadvances	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Basic Sciences as related to CVTS	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar &

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				competitions, case presentations.
		Surgical Skills in CVTS	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Investigative CVTS	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Recent advances in CVTS	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Basic Medical Sciences in Neurology	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions,

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				group activities, educational seminar & competitions, case presentations.
		Disorders of the Nervous System	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Tropical neurology, Neuropsychiatry, neurological involvement in systemic illness.	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.
		Recent advances in Neurology and clinical trials	Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Each super speciality graduate learn about profession ethics, human values, gender equality, health determinants through peer interactions, group activities, educational seminar & competitions, case presentations.

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DYPDCH/487/2023

Date- 28/8/23

Crosscutting Issues.

Sr. No.	Name of the Program	Name of the Course	Relevance to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Description of relevance to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values
1.	B.D.S	General Human Anatomy including Embryology and Histology BD-101	Gender	Lectures on male and female reproductive system
			Ethics	Anatomy act
			Human Values	Awareness regarding organ and body donation
2.	BDS	General Human Physiology & Biochemistry BD- 102	Human Value	The students should develop good rapport with the patient and understand the issue in a broader sense.
			Health determinants	The students should learn to identify the past medical history of each patient and correlate with the present health condition of the patient to provide the appropriate treatment.
			Environment & Sustainability	The students should get to understand the proper segregation of hazardous wastes such as blades, syringes, blood-soaked cotton, tissues, masks and used gloves for efficient disposal.
3.	BDS	Dental Anatomy, Histology & Embryology BD-103	Gender	Anatomical and morphological variation in orofacial structures based on gender is taught.
			Environment And Sustainability	Proper segregation and disposal of biomedical hazard and waste management is done with the help of PASSCO.
			Ethics	Lecture on code of conduct and professional ethics is emphasized
			Human Values	Counselling and interaction is done for the students as per allotment of the mentor

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4.	BDS	General & Dental Pharmacology & Therapeutics BD-202	ENVIRONMENT AND SUSTAINABILITY	Proper disposal of biomedical hazard and waste management is done with the help of PASSCO.
			BIOETHICS	The student will have highest regard for professional ethics and strive to deliver best possible treatment to patients.
5.	BDS	General Pathology and Microbiology	Health determinants	Enumerate common definitions and terms used in Pathology.
			Health determinants	Demonstrate knowledge of the causes, mechanisms, types and effects of cell injury and their clinical significance.
			Health determinants, ethics	Demonstrate and apply basic facts, concepts and theories in the field of Pathology to the practice of dentistry.
			Health determinants	Recognize and analyze pathological changes at Microscopic Level and explain their observations in terms of disease processes.
			Emerging demographic changes/ Ethics, gender	Educate patient regarding preventive aspects of dental pathologies.
6.	BDS	Dental Material Sciences	Human values	Counselling for judicious use of dental materials.
			Environment & Sustainability	Lectures on biomedical waste disposal of dental materials lecture and training of the students.
			Health Determinants	Training the students about allergic reactions to certain materials.
			Ethics	Principals of ethics lecture and seminars.
			Environment and sustainability.	Lectures on proper disposal of scrap amalgam and training of students.
			Emerging demographic changes.	Replacement of amalgam as a restorative material with various tooth-colored materials
			Ethics	Lecture on ethical principles
			Human values	Providing patients a choice of restorative materials.
7.	BDS	Preclinical Prosthodontics	Environment and Sustainability	Lectures on laboratory biomedical waste disposal lecture and training of the students.

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			Gender	Selection of shade and size of teeth and arranging the same according to gender esthetic needs.
			Ethics	Principals of ethics lecture and seminars.
8.	BDS	Preclinical Conservative Dentistry	Environment and sustainability	Training on proper disposal of scrap amalgam and waste management.
			Emerging demographic changes	Replacement of amalgam as a restorative material with various tooth-colored materials.
			Human values	Providing patients, a choice of restorative materials.
9.	BDS	General Medicine BD-301	Environment	Proper disposal of biomedical hazard and waste management is done with the help of PASSCO.
			Ethics	Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
			Gender	Topics and Disease related to both the gender reproductive health are covered during clinical teaching.
10.	BDS	General Surgery BD-302	Environment	Proper disposal of biomedical hazard and waste management is done with the help of PASSCO.
			Ethics	Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
			Gender	Topics and Disease related to both the gender reproductive health are covered during clinical teaching.
11.	BDS	Oral Pathology & Microbiology	Gender	Prevalence of diseases based on gender is given emphasis. Gender determination based on forensic evidence, specimens or casts of orofacial structure is taught.
			Environment And Sustainability	Proper disposal of biomedical hazard and waste management is done with the help of PASSCO.
			Ethics	The student will have highest regard for professional ethics and strive to deliver best possible treatment to patients.
			Human Values	Counselling and interaction is done for the students as per allotment of the mentor.
			Emerging Demographic Changes	Recent trends in demographic variation in prevalence of diseases is emphasized.

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			Health Determinants	Oral pathology syllabus includes study of diseases and its clinical correlation, etiopathogenesis and lab investigations for prevention of diseases. In practice, clinical correlation and indications is taught in detail. Health determinants are taught as Problem based learning and Applied physiology.
MDS	Applied Basic Sciences MDS-06-A- 01		Environment And Sustainability	Proper disposal of biomedical hazard and waste management is done with the help of PASSCO.
			Ethics	Developing knowledge, clinical skills and assisting clinicians to acquire competency in communication, ethics and behavioral skills. Doctor-patient relationship is respected and protected.
			Human Values	Counselling and interaction is done for the students as per allotment of the mentor.
			Gender	Anatomical and morphological variation in oro-facial structures based on gender is taught.
	Oral pathology, Oral Microbiology & Immunology and Forensic odontology MDS-06-B- 01		Environment And Sustainability	Proper disposal of biomedical hazard and waste management is done with the help of PASSCO.
			Ethics	Developing knowledge, clinical skills and assisting clinicians to acquire competency in communication, ethics and behavioral skills. Doctor-patient relationship is respected and protected.
			Human Values	Counselling and interaction is done for the students as per allotment of the mentor. Students will develop skills of case taking to comprehend the person as a whole along with disease process and its causes.
			Health Determinants	Oral pathology syllabus includes study of diseases and its clinical correlation, etiopathogenesis and lab investigations for prevention of diseases. In practical, clinical correlation and indications is taught in detail. Health determinants are


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				taught as Problem based learning and Applied physiology. Clinical teaching includes study of patients in IPD and OPD including their case working and case presentations. Students are engaged in various health checkup camps.
			Gender	Prevalence of diseases based on gender is given emphasis. Gender determination based on forensic evidence, specimens or casts of orofacial structure is taught.
			Emerging Demographic Changes	Recent trends in demographic variation in prevalence of diseases is emphasized.
		Laboratory techniques & Diagnosis and Oral Oncology MDS-06-B- 02	Environment And Sustainability.	Proper disposal of biomedical hazard and waste management is done with the help of PASSCO.
			Ethics	The student will have highest regard for professional ethics and strive to deliver best possible treatment to patients. Doctor-patient relationship is respected and protected.
			Human Values	Counselling and interaction is done for the students as per allotment of the mentor. Students will develop skills of case taking to comprehend the person as a whole along with disease process and its causes.
			Gender	Prevalence of diseases based on gender is given emphasis.
			Health Determinants	Clinical teaching includes study of patients in IPD and OPD including their case working and case presentations.
			Emerging Demographic Changes	Recent trends in demographic variation in prevalence of diseases is emphasized.
12.	BDS	Public Health Dentistry	Environment & Sustainability	Lectures on environment and Health Biomedical waste disposal lecture and training of the students.
			Health determinants	Dimension and determinants of health and disease.
			Emerging demographic changes	Levels of prevention according to their demographic details.
			Ethics	Consent for research, vulnerable population and treatments.


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				Principals of ethics lecture and seminars
			Human values	Counselling for the tobacco cessation.
	MDS	Public Health Dentistry	Environment & Sustainability	Biomedical Waste management and environment and health are taught and practiced.
			Ethics	Principals of ethics and consent for research.
			Human values	Doctor patient relation is evaluated during clinical postings.
			Health determinants	Mortality and morbidity rates are calculated for determination of health.
			Emerging demographic changes	Health education and preventive treatment is tailored as per the needs of the population.
13.	BDS	Periodontology	Gender, health determinants	The student now knows the normal anatomy of Oral mucosa, Gingiva and supporting structures of the teeth & differentiation between the normal and diseased structures of periodontium.
			Emerging demographic changes	The student can analyze and understand the epidemiology and statistics related to Periodontal disease.
			Health determinants	The student knows potential predisposing factors of periodontal disease and methods to manage them.
			Health determinants	The student knows the effects of smoking and parafunctional habits in pathogenesis of periodontal disease.
			Ethics, human values	The student knows the dynamics related to interdisciplinary periodontics and management of cases involving periodontal tissues.
			Ethics, human values	The student knows the periodontal conditions that could be manifestations of systemic conditions in the body and knowledge to refer patients to Specialists and Physicians whenever needed.
			Ethics, human values, Emerging demographic changes	The student can now take Case history records of patients with periodontal disease, formulate provisional diagnosis, advise appropriate investigations to come to a final diagnosis.
				The student can now undertake preventive programs in the community.
			Health determinants	The student now diagnoses periodontal conditions based on risk factors and

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				formulate treatment plan to eliminate those risk factors.
			Ethics, human values	The student can perform treatment procedures like Scaling, Root Planing, Prescribe patients antimicrobial and host modulation therapy and Motivate patient for plaque control.
			Environment and sustainability, Emerging demographic changes	The student is able to understand the importance of motivation and education in society to improve the overall periodontal status in general populations.
			Environment and sustainability Emerging demographic changes	The student can identify social, economic, environmental and emotional determinants in periodontal health and disease conditions and take them into account for planned treatment.
			Health determinants	The student is able to understand ill effects of various deleterious habits on periodontium and take adequate methods to prevent them.
MDS	Periodontology		Gender, Health determinants	The normal anatomy of Oral mucosa, Gingiva and supporting structures of the teeth & differentiation between the normal and diseased structures of periodontium.
			Health determinants	The normal anatomy, functions and pathologies of Temporomandibular joint and its role in maintenance of Periodontal health.
			Health determinants	The normal anatomy, functions and pathologies of Maxillary Sinus.
			Health determinants	The normal anatomy, functions and pathologies of Muscles of mastication and their role in maintenance of Periodontal health.
			Health determinants	The knowledge of Respiratory, Cardiovascular, Gastrointestinal system, Nervous and Endocrine systems and their impact on periodontal health.
			Environment & Sustainability	Basic knowledge about bacteriology, Virology and their implications in periodontal disease.
			Ethics, Environment & Sustainability	General idea about Sterilization, Infection control and asepisis.
			Ethics	Basic knowledge about the pharmacodynamics and pharmacokinetics


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				related to drugs used in periodontal therapy.
			Ethics, health determinants	In depth knowledge about the medical emergencies and the treatment and drugs used for the same.
			Environment & Sustainability, Emerging demographic changes	Basic knowledge about Biostatistics and Epidemiology and its application for basic and clinical research.
			Gender, health determinants	Classify Gingival and Periodontal diseases according to Etiology and diagnose complex periodontal diseases.
			Health determinants	Potential predisposing factors of periodontal disease and methods to manage them.
			Environment & Sustainability, Emerging demographic changes	Effect of smoking and parafunctional habits in pathogenesis of periodontal disease.
			health determinants, ethics	Periodontal conditions that could be manifestations of systemic conditions in the body and knowledge to refer patients to Physicians whenever needed.
			health determinants, ethics	Take Case history records of patients with periodontal disease, formulate provisional diagnosis, advise appropriate investigations to come to a final diagnosis using basic and advanced diagnostic aids.
			Environment & Sustainability, Emerging demographic changes	Understand the need to reach the common public regarding the prevention and control of periodontal disease.
			health determinants, ethics	Diagnose gingival diseases based on clinical features of gingivitis and treat using non-surgical periodontal therapy and gingival surgical techniques.
			Ethics, health determinants	Diagnose Periodontal disease using basic and advanced diagnostic aids and treat them using non-surgical and surgical periodontal therapy.
			Environment & Sustainability, Emerging demographic changes, ethics	Diagnose periodontal disease in the society and maintain the privacy regarding patient diagnosis and investigations.
			ethics, health determinants	Perform regenerative surgical periodontal procedures along with advanced surgical

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				procedures like lasers, Microsurgery and Piezosurgery.
			Ethics, health determinants	Perform basic and advanced implant surgical procedures like Guided bone regeneration and Sinus lift procedures.
			Environment & Sustainability, Emerging demographic changes	Identify social, economic, environmental and emotional determinants in periodontal health and disease conditions and take them into account for planned treatment.
14.	BDS	Orthodontics Bd-403	Environment And Sustainability	Proper disposal of biomedical hazard and waste management is done with the help of PASSCO.
			ETHICS	The student will have highest regard for professional ethics and strive to deliver best possible treatment to patients.
	MDS	Orthodontics & Dentofacial Orthopedics	Environment	Proper disposal of biomedical hazard and waste management is done with the help of PASSCO.
			Ethics	Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
15.	BDS	Oral Medicine and Radiology BD- 404	Environment & Sustainability	Lectures regarding biomedical waste disposal along with radiological waste disposal.
			Health determinants	Oral Medicine includes study of the disease related to oral cavity and systemic complications with etiopathogenesis along with lab investigations which helps in clinical co-relation.
			Ethics	Students are trained towards moral duties related to patients and professional colleague and society.
			Human values	Lectures on orofacial and psychosomatic disease management.
16.	BDS	Oral & Maxillofacial Surgery. BD- 405	Gender	The student should learn to handle a woman during her pregnancy and should have a good knowledge about the medications and procedures to do in the right trimester of the pregnancy.
			Ethics	The students should learn to respect patient's rights and privileges in seeking the treatment of their choice, including patient's right to information and right to seek second opinion.
			Health determinants	With good understanding of the patients' health condition, the students are able to


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				analyze the indications, contraindications, advantages and disadvantages of local and general anesthesia and opt for the best.
	1 st MDS & 3 rd MDS	Applied basic science MDS-03-A-01 Minor oral surgery and maxillofacial trauma MDS-03-B-01	Gender	The students should understand the difference in the growth spurts and tooth eruption stages between boys and girls in order to diagnose and formulate the treatment plan for the children. The chromosomal abnormalities and the autoimmune diseases are better understood.
		Oral and maxillofacial surgery MDS-03-B-02	Environment & Sustainability	A thorough knowledge will ensure the ability to provide good quality care for future generations in terms of medical, surgical and palliative therapy for terminal stage cancers.
			Health determinants	The student will become aware of the ability to assess oral health care with respect to genetics, environmental and physical influences, medical and social factors. The student also becomes efficient to manage the patients in case of medical emergencies.
			Emerging demographic changes	The students will have a clear understanding about the treatment variation in old and young aged individuals. The treatment outcome also varies with age and place
			Ethics & Human values	The five key principles of dental health ethics are patient autonomy, non-maleficence, beneficence, justice and veracity. At the end of the program, students should understand these principles which will provide the guidance needed to ensure that

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				<p>the patients' needs are met within the ethical limits of dental license.</p> <p>The students should follow the best practices of honesty, integrity and professionalism.</p> <p>Students should know the human values that lead to 4 levels of consideration: patient, surgeon, surgical research and education, surgical organization.</p> <p>Surgical training should become explicit in preparing the surgeons for patient-centered management of surgical care.</p>
17.	BDS	Conservative Dentistry & Endodontics	Environment and sustainability	Lectures on proper disposal of scrap amalgam and training of students
			Emerging demographic changes	Replacement of amalgam as a restorative material with various tooth-colored materials, indirect tooth colored restorations
			Ethics	Lecture on ethical principles, importance of informed consent.
			Human values	Providing patients, a choice of restorative materials and treatment options
	MDS	Applied basic sciences	Ethics	Understanding concepts of ethical clearance prior to performing in-vivo studies .
	MDS	Conservative Dentistry	Environment and sustainability	Proper disposal of materials.
			Emerging demographic changes	Replacement of amalgam as a restorative material with various tooth-colored materials, indirect tooth-colored restorations
			Human values	Providing patients, a choice of restorative materials and treatment options.
	MDS	Endodontics	Environment and sustainability.	Proper disposal of materials.
			Ethics	Obtaining informed consent prior to treatment.
18.	BDS	Prosthodontics	Environment & Sustainability	Biomedical waste disposal management.
			Health Determinants	Sterilization and disinfection of instruments and clinical area.


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DR. D. Y. PATIL DENTAL COLLEGE & HOSPITAL

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			Health Determinants	Proper prosthetic management in order to increase the rehabilitate the overall health of patients.
			Human values	Doctor and Patient relationship.
			Ethics	Ethical clinical practice. Avoid malpractice and provide patient centered health care.
MDS	Prosthodontics		Environment & Sustainability	Biomedical Waste management and environment and health are taught and practiced
			Ethics	Principals of ethics and to practice ethically.
			Ethics	Consent for research.
			Human values	Confidentiality.
			Human values	Doctor patient relation is evaluated during clinical postings.
			Human values	Counselling about multiple treatment modalities available for the specific case.
			Health determinants	Proper prosthetic management can reinforce the overall the health of patient.
			Health determinants	Geriatric nutrition counseling.
19.	BDS	Pedodontics & Preventive Dentistry BD-408	Environment And Sustainability	Proper disposal of biomedical hazard and waste management is done with the help of PASSCO.
			Bioethics	The student will have highest regard for professional ethics and strive to deliver best possible treatment to patients.
MDS	Pedodontics & Preventive Dentistry MDS -08-A-01		Environment And Sustainability	Proper disposal of biomedical hazard and waste management is done with the help of PASSCO.
			Bioethics	The student will have highest regard for professional ethics and strive to deliver best possible treatment to patients.

Dr. D. Gopalakrishnan

DEAN

(Dr.D.Gopalakrishnan)

Dean

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1.3.1 Description of courses that integrate crosscutting issues relevant to Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging demographic changes and Professional Ethics in the curricula

Sr. No.	Name of the Program	Name of the Course	Relevance to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values (Choose the appropriate option)	Description of activities related to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values
1.	B. Tech. Biotechnology	Communication skills	Human values	Students will be able to communicate better and would be able to develop good human values.
		Environmental science	Environment & Sustainability	Students will gain basic understanding of natural resources, ecosystem and its structural and functional aspects
		Disaster management	Environment & Sustainability Emerging demographic changes	Students will understand about disasters, their types and significance and understanding of approaches of Disaster Risk Reduction
		Microbiology and virology	Health determinants	Students will understand the concepts of microbiology and use the knowledge in the development of vaccines for human health.
		Genetics	Health determinants	Students will understand basics of genetic mapping and sex determination, population and quantitative genetics
		Biosafety, bioethics and intellectual property rights	Ethics	Students will get basic awareness about the concepts and significance of Intellectual Property

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			Rights and take measures to protect their innovative ideas
	Stem cells and animal tissue culture	Health determinants	Students will acquire the knowledge of stem cells in developing stem cell therapies.
	Environmental biotechnology	Environment & Sustainability	Students will understand significance of bioremediation, waste management and biofuels
	Recombinant dna technology	Ethics	Students will be able to assess the risk versus benefits of rDNA technology and practice, safety and other regulations for rDNA work
	Personality and skill development	Human values	Students will be able to communicate better and would be able to develop good human values.
	Biopharmaceuticals	Health determinants	Students will use the knowledge of drug formulations for developing better therapeutics.
	Human disease and pathobiology	Health determinants	Student will understand various human diseases
	Clinical research	Health determinants	Students can have updated information regarding the current situation of the clinical research in India and future for clinical research on topics that are relevant from Indian perspective
	Marine biotechnology	Emerging demographic changes	Students will gain knowledge of various marine resources and their applications.
	Principles of Management & Entrepreneurial Developments	Ethics	Students can have updated information regarding management techniques and ethical issues related to entrepreneurial development.
	Basic pharmacology & toxicology	Health determinants	Students will use the knowledge of drug formulations for developing better therapeutics.



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	Genomics, transcriptomics & proteomics	Health determinants	Students will gain knowledge of the Practical and theoretical skills concerning classical as well as new large-scale and technology driven approaches in molecular biology and know how to use and where to use.
	Agriculture biotechnology	Environment & Sustainability	Students will understand different biotechnological methods to improve the crop production and for sustainable agriculture
	Cancer biology	Health determinants	Students will familiarize with knowledge on current diagnostic and therapeutic avenues for cancer patients.

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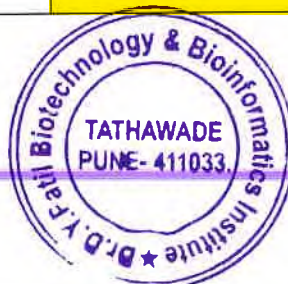


Sr. No.	Name of the Program	Name of the Course	Relevance to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values (Choose the appropriate option)	Description of activities related to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values
1.	B. Tech. Medical Biotechnology	COMMUNICATION SKILLS	Human values	Students will be able to communicate better and would be able to develop good human values.
		ENVIRONMENTAL SCIENCE	Environment & Sustainability	Students will gain basic understanding of natural resources, ecosystem and its structural and functional aspects
		DISASTER MANAGEMENT	Environment & Sustainability Emerging demographic changes	Students will understand about disasters, their types and significance and understanding of approaches of Disaster Risk Reduction
		MICROBIOLOGY AND VIROLOGY	Health determinants	Students will understand the concepts of microbiology and use the knowledge in the development of vaccines for human health.
		HUMAN GENETICS	Health determinants	Students will understand basics of genetic mapping and sex determination, population and quantitative genetics
		BIOSAFETY, BIOETHICS AND INTELLECTUAL PROPERTY RIGHTS	Ethics	Students will get basic awareness about the concepts and significance of Intellectual Property Rights and take measures to protect their innovative ideas

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	ANIMAL TISSUE CULTURE	Health determinants	Students will acquire the knowledge of stem cells in developing stem cell therapies.
	GENETIC ENGINEERING	Ethics	Students will be able to assess the risk versus benefits of rDNA technology and practice, safety and other regulations for rDNA work
	BIOPHARMACEUTICALS	Health determinants	Students will use the knowledge of drug formulations for developing better therapeutics.
	CLINICAL TRIALS	Health determinants	Students can have updated information regarding the current situation of the clinical research in India and future for clinical research on topics that are relevant from Indian perspective
	DISEASE BIOLOGY	Health determinants	Student will understand various human diseases
	Human Anatomy & Physiology	Health determinants	Students will understand the basics of human anatomy and will be able to apply it for various biotechnological applications.
	Pharmacology & Toxicology	Health determinants	Students will use the knowledge of drug formulations for developing better therapeutics.
	Nanomedicine	Health determinants	Students will use the knowledge of nano medicine in drug formulations for developing better therapeutics.
	Biomedical Devices and Instruments	Health determinants	Students will acquire the knowledge of various biomedical devices and learn instrument operating skills and can get employability options in hospitals, national labs as well as industries.



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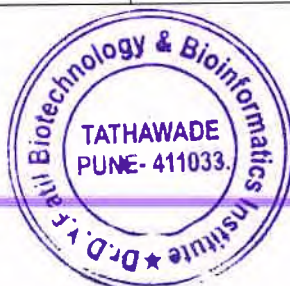
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	Artificial Organs and Biomimetics	Health determinants	Students will have sufficient scientific understanding of different types artificial organs from the more basic types such as prostheses, to more advanced technologies such as operative devices, biohybrid organs, bionics technology. Have awareness of clinical considerations and ethical issues with respect to Artificial Organs
	Health Care Law Management	Health determinants	Student will understand the management aspect of healthcare services and clinical oriented research and be able to develop management skills which focus on healthcare services
	Genomics, Transcriptomics & Proteomics	Health determinants	Students will gain knowledge of the Practical and theoretical skills concerning classical as well as new large-scale and technology driven approaches in molecular biology and know how to use and where to use.
	Molecular Diagnostics	Health determinants	Students will understand the importance of various molecular techniques in clinical diagnosis and understand how molecular markers could be used in predictive and prognostic evaluation of diseases
	Vaccine Technology	Health determinants	Students will understand recent advances in vaccine technology can develop new strategies in vaccine production.
	Personalized Medicine	Health determinants	Student will understand the basic principles governing the rational drug design, RNA-based therapeutics, gene

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				editing systems and artificial intelligence platforms and their applications for tailored diagnosis and treatments
		Biomechatronics	Health determinants	Students will acquire the knowledge of various artificial devices used in the medical fields and learn operating skills
		Epidemiology and Public Health	Health determinants	Students will be able to describe epidemiologic methods and approaches for investigating health and disease in Populations.
		Cancer biology	Health determinants	Students will familiarize with knowledge on current diagnostic and therapeutic avenues for cancer patients.

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Sr. No.	Name of the Program	Name of the Course	Relevance to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values (Choose the appropriate option)	Description of activities related to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values
1.	M. Tech. Integrated Biotechnology	Communication skills	Human values	Students will be able to communicate better and would be able to develop good human values.
		Environmental science	Environment & Sustainability	Students will gain basic understanding of natural resources, ecosystem and its structural and functional aspects
		Disaster management	Environment & Sustainability Emerging demographic changes	Students will understand about disasters, their types and significance and understanding of approaches of Disaster Risk Reduction
		Microbiology and virology	Health determinants	Students will understand the concepts of microbiology and use the knowledge in the development of vaccines for human health.
		Genetics	Health determinants	Students will understand basics of genetic mapping and sex determination, population and quantitative genetics
		Biosafety, bioethics and intellectual property rights	Ethics	Students will get basic awareness about the concepts and significance of Intellectual Property Rights and take measures to protect their innovative ideas

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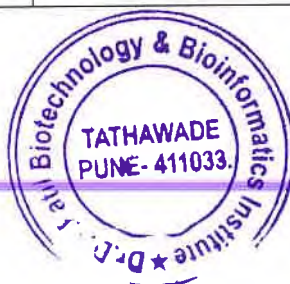
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	Animal tissue culture	Health determinants	Students will acquire the knowledge of stem cells in developing stem cell therapies.
	Environmental biotechnology	Environment & Sustainability	Students will understand significance of bioremediation, waste management and biofuels
	Recombinant dna technology	Ethics	Students will be able to assess the risk versus benefits of rDNA technology and practice, safety and other regulations for rDNA work
	Personality and skill development	Human values	Students will be able to communicate better and would be able to develop good human values.
	Biopharmaceuticals	Health determinants	Students will use the knowledge of drug formulations for developing better therapeutics.
	Clinical research	Health determinants	Students can have updated information regarding the current situation of the clinical research in India and future for clinical research on topics that are relevant from Indian perspective
	Disease biology	Health determinants	Student will understand various human diseases
	Marine biotechnology	Emerging demographic changes	Students will gain knowledge of various marine resources and their applications.
	Principles of Management & Entrepreneurial Developments	Ethics	Students can have updated information regarding management techniques and ethical issues related to entrepreneurial development.
	Molecular Diagnostics	Health determinants	Students will understand the importance of various molecular techniques in clinical diagnosis and understand how molecular


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				markers could be used in predictive and prognostic evaluation of diseases
		Biomedical engineering	Health determinants	Students will acquire the knowledge of various biomedical devices and learn instrument operating skills and can get employability options in hospitals, national labs as well as industries.
		Agriculture biotechnology	Environment & Sustainability	Students will understand different biotechnological methods to improve the crop production and for sustainable agriculture
		Cancer biology	Health determinants	Students will familiarize with knowledge on current diagnostic and therapeutic avenues for cancer patients.

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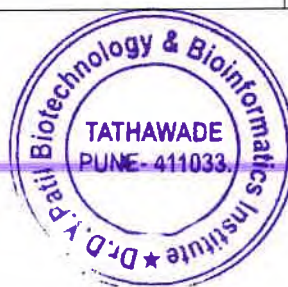
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Sr. No.	Name of the Program	Name of the Course	Relevance to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values (Choose the appropriate option)	Description of activities related to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values
	M. Sc. Biotechnology	Genetics	Health determinants	Students will understand basics of genetic mapping and sex determination, population and quantitative genetics
		Genomics, & proteomics	Health determinants	Students will gain knowledge of the Practical and theoretical skills concerning classical as well as new large-scale and technology driven approaches in molecular biology and know how to use and where to use.
		Microbiology	Health determinants	Students will understand the concepts of microbiology and use the knowledge in the development of vaccines for human health.
		Vaccines	Health determinants	Students will get knowledge of various infectious diseases and development of vaccines against them.
		Plant and animal biotechnology	Health determinants	Students will acquire the knowledge of stem cells in developing stem cell therapies.
		Intellectual property rights, biosafety and bioethics	Ethics	Students will get basic awareness about the concepts and significance of intellectual property rights and take measures to protect their innovative ideas

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		Environmental biotechnology	Environment & sustainability	Students will understand significance of bioremediation, waste management and biofuels
		Bioentrepreneurship	Ethics	Students can have updated information regarding management techniques and ethical issues related to entrepreneurial development.
		Genetic engineering	Ethics	Students will be able to assess the risk versus benefits of rDNA technology and practice, safety and other regulations for rDNA work
		Molecular diagnostics	Health determinants	Students will understand the importance of various molecular techniques in clinical diagnosis and understand how molecular markers could be used in predictive and prognostic evaluation of Diseases
		Nanobiotechnology	Health determinants	Students will use the knowledge of nano medicine in drug formulations for developing better therapeutics.

Prof. Neelu Nawani

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Director

<p>1.3.1</p>	<p>Institution integrates crosscutting issues relevant to Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging demographic changes, and Professional Ethics in the curricula.</p>
<p>QIM</p>	<p>The Institute has incorporated courses such as Disaster Management, Universal Human Values, Ethics, Biosafety and Hazard Management in Biotechnology, and Hospital Hygiene & Waste Management that incorporate aspects relating to Environment and Sustainability.</p> <p>As a step towards integrated crosscutting issues, the Disaster Management course is taught to all the students pursuing their BBA and MBA programme. This course enables students to recognize the increasingly disastrous risk to the planet.</p> <p>The course Universal Human Values is designed to nurture societal values in young minds. This subject explores the importance of Universal Human Values for health, happiness, and harmony and facilitates the development of a holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of human reality and the rest of existence.</p> <p>Ethics, Biosafety, and Hazard Management in Biotechnology are offered to students who opt for Biotechnology and Bio-Informatics Management. Biosafety is the prevention of large-scale loss of biological integrity, focusing both on ecology and human health. Biosafety is used to protect from harmful incidents.</p> <p>For the protection of the environment from research laboratory practices, students are taught in their course how to ensure proper safety and security standards so that the least possible damage is done to the environment.</p> <p>Hospital Waste Management is offered to students who opt for Hospital and Health Care Management as a specialization. This course provides insights on how hospital waste needs to be disposed of to ensure environmental safety and sustainability.</p> <p>In the context of Human Values and Professional Ethics, the course titled Business Ethics &</p>



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1.3.1	Institution integrates crosscutting issues relevant to Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging demographic changes, and Professional Ethics in the curricula.
	Corporate Governance & Social Responsibility is taught to facilitate students' in-depth understanding of Ethics in their professional and personal lives. In addition to this psychometric test, counseling and mentoring sessions are given one on one to students and are encouraged to discuss challenges & seek guidance from mentors.

Dr. Chetan Chaudhari
Director

Dr. Chetan Chaudhari
Director
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1.3.1 Institution integrates crosscutting issues relevant to Gender, Environment, and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging Demographic Changes, and Professional Ethics in the curricula

Integrated Cross-Cutting Issues	Courses Covered in Curriculum
Gender	NA
Environment and Sustainability	1. Disaster Management 2. Ethics, Biosafety, and Hazard Management in Biotechnology 3. Hospital Waste & Hygiene Management
Human Values	1. Universal Human Values 2. Business Ethics & Corporate Governance & Social Responsibility
Health Determinants	Hospital Waste & Hygiene Management
Right to Health Issues	Community Health Management
Emerging demographic changes	NA
Professional Ethics	Business Ethics & Corporate Governance & Social Responsibility

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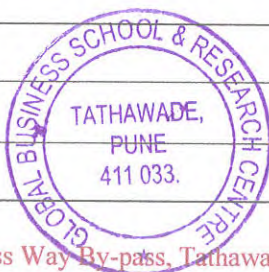
Director

1.3.1 Institution integrates crosscutting issues relevant to Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging Demographic Changes and Professional Ethics in the curricula

MBA PROGRAMME

ACADEMIC YEAR 2022-23

Sr. No.	Name of the Courses	Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging Demographic Changes and Professional Ethics	Description of Activities
1.	Principles and Practices of Management		
2.	Organizational Behavior		
3.	Accounting for Business Decisions		
4.	Managerial Economics		
5.	Basics of Marketing		
6.	Business Law		
7.	Statistics and Quantitative Techniques		
8.	Business Communication		
9.	Introduction to Agribusiness Management		
10.	Introduction to Finance		
11.	Personnel Administration and Documentation		
12.	Introduction to Pharmaceutical Business Environment		
13.	Introduction to Life Sciences, Biotechnology and Bioinformatics		
14.	Introduction to IT		
15.	Introduction to International Business		
16.	Healthcare and Hospital Management		
17.	Introduction to Operations and Supply Chain Management		
18.	Introduction to Business Analytics		




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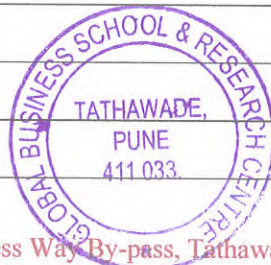
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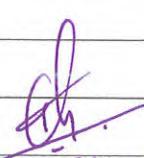
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Sr. No.	Name of the Courses	Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging Demographic Changes and Professional Ethics	Description of Activities
19.	Disaster Management	Environment and Sustainability	The student will be able to develop capacity to describe, analyze and evaluate the environmental, social, cultural, economic, legal, ethical and organizational aspects influencing vulnerabilities and capacities to face disasters.
20.	Marketing Management		
21.	Financial Management		
22.	Human Resource Management		
23.	Operations Management		
24.	Research Methodology for Managers		
25.	Data Analytics		
26.	Emotional and Spiritual Intelligence for Managerial Effectiveness		
27.	Entrepreneurship Development and Project Management		
28.	Entrepreneurship Development in Agri sector (Only for ABM Specialization instead of MB 208)		
29.	Management of Agriculture and Allied sciences		
30.	Financial Markets and Services		
31.	Training and Development		
32.	Pharmaceutical Management		
33.	Application and Methodology of Biotechnology		
34.	IT in Business Management		
35.	Export and Import Management		
36.	Hospital Administrations		
37.	Production and Operations Management		
38.	Applications of Business Analytics		




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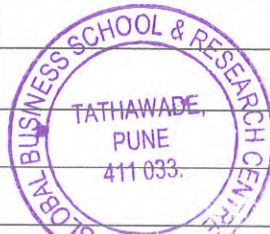
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Sr. No.	Name of the Courses	Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging Demographic Changes and Professional Ethics	Description of Activities
39.	Industry Sectoral Analysis		
40.	Strategic Management		
41.	Start-Up and New Venture Management		
42.	Sales and Distribution Management		
43.	Digital Marketing		
44.	Product and Brand Management		
45.	Consumer Behaviour		
46.	Integrated Marketing Communications		
47.	Marketing Research		
48.	Rural Marketing		
49.	Current Trends in Agri Business Management		
50.	Livestock Management and Fodder Technology		
51.	Management of Agricultural Engineering Business		
52.	Marketing of Agri- Inputs and Outputs		
53.	Post-Harvest Technology and Management		
54.	Agri Import and Export Management		
55.	Emerging Trends in Organic Farming		
56.	Advanced Corporate Finance		
57.	Fixed Income Securities		
58.	Financial Derivatives		
59.	Taxation		
60.	Security Analysis and Portfolio Management		
61.	Analysis of Financial Statements		
62.	Financial Technology		

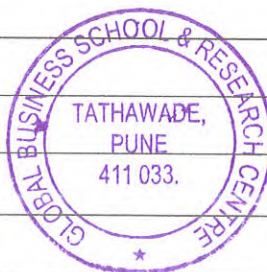


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Sr. No.	Name of the Courses	Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging Demographic Changes and Professional Ethics	Description of Activities
63.	Human Resource Planning		
64.	Talent Acquisition and Staffing		
65.	Human Resource Development		
66.	Performance Compensation Management		
67.	Labour Laws	Human Values	Students will be able to demonstrate an appreciation of the industrial, economic and social contexts in which labour is regulated. Students will be able to analyse welfare and wage Legislations to integrate the knowledge of Labour Law in General HRD Practice.
68.	Strategic HRM		
69.	HR Analytics		
70.	Anatomy, Physiology and Health Education		
71.	Management of Multinational Pharmaceuticals		
72.	Business Leadership in Pharma		
73.	Pharma Product and Brand Management		
74.	Pharma Sales, Distribution and Retail Management		
75.	Pharmaceutical Manufacturing and Regulatory Affairs		
76.	Pharmaceutical Management Information System		
77.	Principles of Immunology		
78.	Computational Biology and Bioinformatics		
79.	Intellectual Property rights and Technology Transfer in Biotechnology		
80.	Food Technology and Fundamentals of Production Planning		
81.	Ethics, Biosafety and Hazard Management In Biotechnology	Environment and Sustainability	Students will be able to elaborate the basic issues of Biosafety, Bioethics and IPR and implement in future policy making

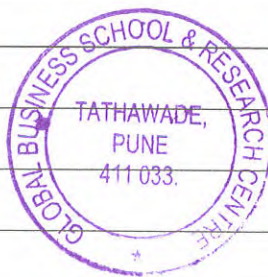


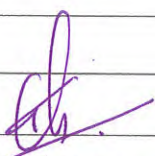
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Sr. No.	Name of the Courses	Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging Demographic Changes and Professional Ethics	Description of Activities
82.	Environmental Biotechnology and Environment Management		
83.	Fundamentals of Nanotechnology		
84.	Cloud Computing		
85.	Software Quality Management		
86.	E-Business and Business Intelligence		
87.	E – Commerce and Social Media Marketing		
88.	Database Management System		
89.	Supply Chain Management Information Systems		
90.	Software Project Management		
91.	International Business Environment and Trade Institutions		
92.	International Business Economics		
93.	Emerging Trends in International Business		
94.	International Trade, WTO and Trade Policy Issues		
95.	Intellectual Property Rights		
96.	International Banking		
97.	International Logistics & Supply Chain Management		
98.	Medical Tourism and Transnational Healthcare		
99.	Management of Mediclaim and TPAs in Hospitals		
100.	Essentials for Training & Development for Healthcare Professionals		
101.	Community Health Management	Health Determinants, Right to Health Issues, Emerging Demographic Changes	Students will be able to define and distinguish the concepts of health, quality of life, impairment, activity limitation, and participation restriction. They will also be able to describe study of health and disease.
102.	Laws Related to Hospital and Medical Services		




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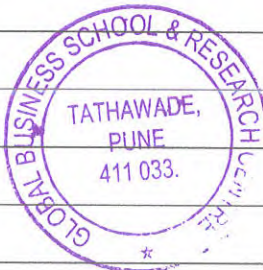
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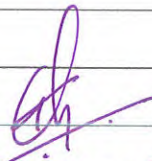
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103.	Management of Hospital Information System		
104.	Quality & Accreditation In Healthcare Sector		
105.	Inventory Management		
106.	Quality Management		
107.	Service Operations Management		
108.	Operations Research and Management		
109.	Logistics Management		
110.	Supply Chain Management		
111.	Operations Strategy		
112.	Workforce Analytics		
113.	Analytics for Marketing		
114.	Retail Analytics		
115.	Analytics for Business Functions		
116.	Performing Analytics with Python		
117.	Machine Learning with R Programming		
118.	Descriptive Analytics (Using Tableau)		
119.	Introduction to Cyber Security		
120.	Summer Internship Project (SIP)		
121.	Cases in Management (Marketing)		
122.	International Marketing		
123.	Strategic Marketing		
124.	Marketing of Financial Services		
125.	Retail Management		
126.	Services Marketing		




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127.	B 2 B Marketing		
128.	Cases in Management (Agribusiness)		
129.	Agricultural Economic		
130.	Framework of ICT in Agribusiness Management		
131.	Rural Credit and Urban Finance for Agriculture		
132.	Procurement and Warehouse Management		
133.	Management of Agri Cooperatives		
134.	Agricultural Risk Management And Crop Insurance		
135.	Cases in Management (Finance)		
136.	Corporate Financial Restructuring		
137.	Equity Research		
138.	Financial Modelling		
139.	Insurance and Risk Management		
140.	Strategic Financial Management		
141.	Behavioural Finance		
142.	Cases in Management (HR)		
143.	Knowledge Management		
144.	HR Perspectives in Mergers & Acquisitions		
145.	Organizational Change and Development		
146.	International HRM		
147.	Talent Retention and Employee Engagement		
148.	Competency Mapping & Career Development		
149.	Cases in Management (Pharma)		
150.	Advertising and Service Management in Pharmaceutical Industry		




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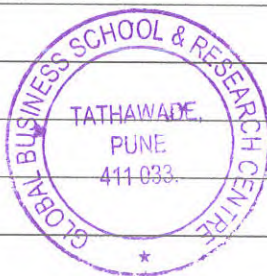
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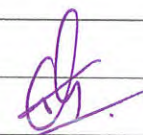
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151.	Pharma and Healthcare Management		
152.	Intellectual Property Rights and Legal Aspects In Pharmaceutical Industry		
153.	Pharmaceutical Export Management		
154.	Marketing Strategy and Product Launch Dynamics		
155.	Pharmaceutical Advance Human Resource Management		
156.	Cases in Management (Biotech & Bioinformatics)		
157.	Biotechnology Social, Legal and Ethical Issues		
158.	Biotech Industry and Post Pandemic Resilience Management		
159.	Fermentation Technology and Industrial Biotechnology		
160.	Advances in Biotechnology and Bioinformatics		
161.	Agricultural Biotechnology	Environment and Sustainability	The students will be able to analyze different methods of Crop Improvement. The students will be able to demonstrate Gene transformation techniques in Plant Biotechnology. The students will be able to assess how modern agricultural biotechnology and genetic resources can be harnessed to achieve environmental sustainability.
162.	Biotechnology and Pharma Plant Management		
163.	Cases in Management (IT & Systems Management)		
164.	E- Governance and Framework of ICT		
165.	E-Learning Tools and Methods		
166.	Innovation And Technology Management		
167.	Marketing of Information Technology		
168.	Knowledge Management System		
169.	Enterprise Resource Planning		

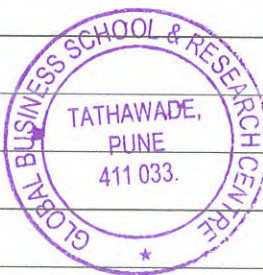


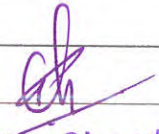

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170.	Cases in Management (International Business Management)		
171.	Legal Framework for International Business		
172.	Global Market Research		
173.	International Marketing		
174.	International Finance and Forex Management		
175.	International Business Strategy		
176.	Export Import Procedures & Documentation		
177.	Cases in Management (Hospital & Health Care Management)		
178.	Financial Management of Hospital and Healthcare Organizations		
179.	Introduction of Artificial Intelligence in Healthcare		
180.	Management of Corporate Hospital		
181.	Hospital Waste and Hygiene Management	Environment and Sustainability	The students will be able to discover waste management practices and technologies that are safe, efficient, sustainable, economic and culturally acceptable; to enable the participants to identify the systems suitable for their particular circumstances.
182.	Marketing of Hospital and Healthcare Services		
183.	Planning & Management of Hospital Clinical & Supportive Services		
184.	Cases in Management (Operations Management & SCM)		
185.	Warehouse Management		
186.	Lean Management		
187.	Management of Manufacturing System		
188.	Project Management		
189.	Innovation and R & D Management		
190.	World Class Manufacturing		




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191.	Cases in Management (Business Analytics)		
192.	Artificial Intelligence in Business Applications		
193.	Supply Chain Analytics		
194.	Data Visualization for Managers		
195.	Security and Master Data Management		
196.	Internet of Things		
197.	Social Media, Web & Text Analytics		
198.	Business Ethics	Human Values & Professional Ethics	The students will be able to acquire a basic and clear understanding of philosophical ethics The students will be able to understand the principles of moral decision-making in global business
199.	Design Thinking		


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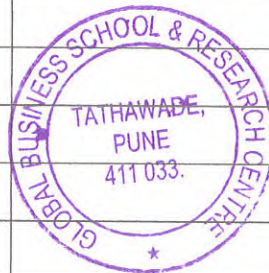
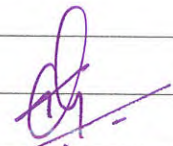
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1.3.1 Institution integrates crosscutting issues relevant to Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging Demographic Changes and Professional Ethics in the curricula

BBA PROGRAMME

ACADEMIC YEAR 2022-23

Sr. No.	Name of the Courses	Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging Demographic Changes and Professional Ethics	Description of Activities
1.	Fundamentals of Management		
2.	Basics of Marketing		
3.	Basics of Accounting		
4.	Introduction to Economics		
5.	Environmental awareness and Disaster Management	Environment and Sustainability	The student will be able to develop the capacity to describe, analyze and evaluate the environmental, social, cultural, economic, legal, ethical and organizational aspects influencing vulnerabilities and capacities to face disasters
6.	Business English		
7.	Universal Human Values	Human Values & Professional Ethics	The students will be able to acquire a basic and clear understanding of philosophical ethics The students will be able to understand the principles of moral decision-making in global business
8.	Organizational Behaviour		
9.	Indian Economy		
10.	Marketing Management		
11.	Business Environment		
12.	Indian Banking System		
13.	Soft Skills - I		

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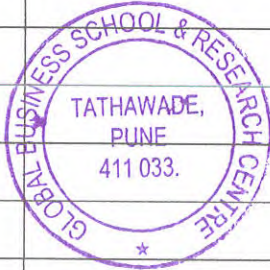
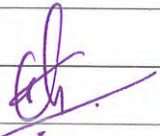
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14.	Human Resource Management		
15.	Banking Operations		
16.	Introduction to Psychology		
17.	Research Methodology		
18.	Business Law		
19.	Soft Skills - II		
20.	Management Information System		
21.	Entrepreneurship Development		
22.	Introduction to International Business		
23.	Quantitative Techniques		
24.	Financial Management		
25.	Introduction to Digital Marketing		
26.	Introduction to Production Management		
27.	Business Ethics and Corporate Governance	Human Values and Professional Ethics	The students will be able to acquire a basic and clear understanding of philosophical ethics The students will be able to understand the principles of moral decision-making in global business
28.	Marketing of Financial Services		
29.	Project Work		
30.	Project Management		
31.	Event Management		
32.	Fundamentals of E- Commerce		 Dr. Chetan Chaudhari Director Global Business School & Research Centre Tathawade, Pune - 411 033.
33.	Introduction to SMEs		
34.	Analysis of Financial Statement		
35.	Long Term Finance		



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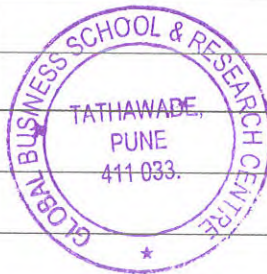
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Sr. No.	Name of the Courses	Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging Demographic Changes and Professional Ethics	Description of Activities
36.	Indian Financial system and Financial Markets		
37.	Direct and Indirect Tax		
38.	Consumer Behaviour		
39.	Sales Management		
40.	Advertising and Sales Promotion		
41.	Retail Management		
42.	Human Resource Planning		
43.	Training and Development		
44.	Industrial Relations and Labour Laws		
45.	Change Management		
46.	Introduction to Agribusiness Management		
47.	Agricultural and Rural Development		
48.	Agri Export Import Management		
49.	Recent Trends in Agricultural Business		
50.	Introduction to Hospital and Healthcare Management		
51.	Hospital Administration		
52.	Community Health Management	Health Determinants, Right to Health Issues, Emerging Demographic Changes	Students will be able to define and distinguish the concepts of health, quality of life, impairment, activity limitation, and participation restriction.
53.	Healthcare Laws		
54.	Introduction to Pharmaceutical Business		
55.	Production Management in Pharmaceuticals		
56.	Pharmaceutical Product and Brand Management		
57.	Pharma Sales, Distribution and Management		
58.	Introduction to Biotechnology		



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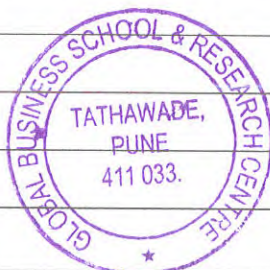
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Sr. No.	Name of the Courses	Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging Demographic Changes and Professional Ethics	Description of Activities
59.	Fundamentals of Bioinformatics		
60.	Application and Methodology of Biotechnology		
61.	Fundamentals of Production Planning in Biotechnology		
62.	Introduction to IT		
63.	Applications of IT		
64.	Database Management System		
65.	Innovation and Technology Management		
66.	Fundamentals of International Business		
67.	International Institutions and Trade Implications		
68.	Export Import Documentation and Logistics		
69.	International Strategic Management		
70.	Aesthetics and Visual Communications		
71.	Creative writing		
72.	Corporate Communication and Strategy		
73.	Advertising and Integrated Marketing Communications		
74.	PR Communication		
75.	Photography Studio Management		
76.	Sound Studio Recording and Production		
77.	Radio Production		
78.	Media Finance and Budgeting		
79.	Film and TV Production Programming		
80.	Film, TV Production Process		
81.	Media Project Management Event Management		
82.	Project Work-Media Production II		



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Sr. No.	Name of the Courses	Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging Demographic Changes and Professional Ethics	Description of Activities
83.	New Media Production and Management		

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1.	BPT	H. Anatomy I	Learn about Male and Female System	Lecture
2.	BPT	H. Physiology I	Physical fitness- Cardiopulmonary efficiency tests Stethography, Spirometry Ergography, Perimetry, ECG	Lecture
3.	BPT	English & Communication Skills	Build good relation ,interacts with others and work Role Play, Health & disease as values and facts, Health & disease as values and facts	Role play
4.	BPT	Electrotherapy I	Learn about Biophysical effects of cryotherapy and high frequency currents	Practical
5.	BPT	H. Anatomy II	Surface anatomy and bony landmarks	Lecture
6.	BPT	H. Physiology II	maturation till functional anatomy of reproductive system, puberty, spermatogenesis, menstrual cycle, pregnancy and pregnancy tests, ageing. Puberty, changes in males and females	Lecture
7.	BPT	Biochemistry	Importance of nutrition dietary recommendations	Lecture
8.	BPT	Exercise Therapy I	Respect , care and Equality in dignity of all human beings, human dignity in different cultural & moral traditions	Practical
9.	BPT	Computer Science	Use Internet services for Research and Documentation	Lecture
10.	BPT	Pathology and Microbiology	Correlate normal & altered morphology of different organ systems in different diseases for understanding disease process & their clinical significance (with special emphasis to Neuro- Musculo-skeletal & cardio-respiratory systems).	Lecture
11.	BPT	Exercise Therapy II	Benefit and harm of patient's right & dignity in Health care settings by physiotherapy	Role Play
12.	BPT	Psychology	Role of learning in human life Psychological Reactions of a Patient	Practical demonstration

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Sr. No.	Name of the Program	Name of the Course	Relevance to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Description of activities related to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values
13.	BPT	Biomechanics	Effect of immobilization, injury & aging on joint	Hands on Practical demonstration
14.	BPT	First Aid and Emergency care	Examination of Vital Signs.	Practical demonstration
15.	BPT	Pharmacology	Get the awareness of other essential & commonly used drugs, need for their use & common as well as serious adverse reactions	Lecture
16.	BPT	Electrotherapy II	Respect for human vulnerability and personal integrity	Role Play
17.	BPT	Gen. Medicine	Aging Process, General Health Care, Wellness Clinic Nutrition Deficiency Disease & Drug Abuse / Intoxication	Lecture
18.	BPT	Community Medicine, Sociology & Environmental Sciences	Concepts, aims and objectives Approaches to health education Models & Contents of health education Principles & Practice of health education, Human Population and the Environment, Social Issues and the Environment	Lecture
19.	BPT	Orthopaedics and Traumatology	Clinical examination in an Orthopaedic patient	Practical Demonstration on patient
20.	BPT	Neurology (Including Paediatrics and Psychiatry)	Understand adult and paediatric conditions with conservative and surgical treatment approaches, Mental status examination	Practical Demonstration on patient
21.	BPT	Physical and Functional Diagnostics Skills	Autonomy and individual responsibility, Consent	Role Play
22.	BPT	Obstetrics and Gynaecology	Describe normal anatomy of female genital system and pelvic floor, menstrual cycle and its disorder	Practical Demonstration on patient
23.	BPT	Gen. Surgery including Plastic Surgery	Understand, classify, clinically assess, evaluate & describe surgical management	Practical Demonstration on patient
24.	BPT	Physiotherapeutics Skills	Describe human development & maturation	Practical Demonstration on patient
25.	BPT	Bioengineering and Professional Ethics	Privacy and confidentiality, Equality & Non-discrimination Performance analysis, local health care organization	Role Play
26.	BPT	PT in Musculoskeletal Sciences	Advice about ergonomics, home exercise programs, functional independence in activities of daily living, to improve quality of life of a patient.	Practical Demonstration on patient

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Pune-18.

Sr. No.	Name of the Program	Name of the Course	Relevance to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Description of activities related to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values
27.	BPT	PT in Community Based Rehabilitation	Women's Health, Geriatrics, Fitness & Health Promotion, Community Health, Solidarity and cooperation, Social responsibility and health, Sharing of benefits	Practical Demonstration on patient and Role Play
28.	BPT	Choice Based(PT in Paediatrics)	Advice and counsel neuro-paediatric care	Practical Demonstration on patient
29.	BPT	Choice Based(Manual Therapy)	Deliver effective manual therapy treatment plan for pathologies that are within the scope of Physiotherapy practice.	Practical Demonstration on patient
30.	BPT	PT in Neurosciences	Protecting future generations & Protection of Environment	Tutorial
31.	BPT	PT in Cardiorespiratory and General Conditions	Select strategies for cure, care & prevention Quality of life questionnaires	Practical Demonstration on patient
32.	BPT	Choice Based (Sports Physiotherapy)	De training effects, Evolution of Physical fitness	Practical Demonstration on athletes
33.	BPT	Choice Based(Hand Rehabilitation)	Design exercise protocols for patients in local language	Practical Demonstration on patient
34.	MPT	Physiotherapy Practice & Education Technology	Concept of morality, Ethics & Legality, confidentiality and responsibility. Introduction to ethics & bioethics, Human dignity and human rights, Benefit and harm of patient's right & dignity in Health care settings by physiotherapy	Case scenario
35.	MPT	Research Methodology and Biostatistics	Autonomy and individual responsibility, Vital health statistics	Case Senario
36.	MPT	Advanced Electrotherapy and Electro Diagnosis	Respect for human vulnerability & personal integrity	Case Scenario
37.	MPT	Advance Functional diagnosis & Manipulative Skills	Solidarity and cooperation	Case Scenario
38.	MPT	Physiotherapeutics-I	appropriate Physiotherapeutic Technique / approaches to treat patient	Case scenario, practical
39.	MPT	Applied Biomechanics and Kinesiology	Privacy and confidentiality, equality & Non-discrimination	Case Scenario

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Sr. No.	Name of the Program	Name of the Course	Relevance to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Description of activities related to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values
40.	MPT	Exercise Physiology, Health and Fitness	Protecting future generations, Protection of the environment	PBL
41.	MPT	Physiotherapeutics-II	Discuss the recent management approaches for common conditions and deliberate on best practice model for patient centered care	Practical
42.	MPT	Orthopaedics-Clinical Sciences I	Orthopaedic patient history taking, clinical features, clinical examination and investigation.	Clinical Discussions
43.	MPT	Orthopaedics-Physiotherapeutics I	Assessment & Evaluation in detail related to orthopaedic patient	Case presentation
44.	MPT	Orthopaedics - Recent Advances I	Evidence-based practice in the field of musculoskeletal physiotherapy in musculoskeletal dysfunction, clinical decision making in orthopaedic patient	PBL
45.	MPT	Orthopaedics-Advanced Physiotherapeutics I	Use Recent Physiotherapeutic Technique/ approaches to treat patients with musculoskeletal disorders in different age groups.	Practical
46.	MPT	Neurosciences - Clinical Sciences I	Recognize the implications of dysfunction of the neurological system and its correlation with students-clinical decision making their epidemiology and etiological factors.	Case- discussions
47.	MPT	Neurosciences - Physiotherapeutics I	Use of Neuro-physiotherapy techniques to treat and train patients with neurological disorders through all age groups.(Paediatrics, Adults and Geriatrics) and execute professional practice through ethical code, Develop good interpersonal relationship, expertise in soft skills with Patient and their care taker	Clinical presentation
48.	MPT	Neurosciences - Recent Advances I	evidence based practice with efficient clinical expertise giving reference to the line of treatment being followed along with patient's informed consent	PBL
49.	MPT	Neurosciences-Advanced Physiotherapeutics I	Correlate Neuromusculoskeletal system with updated clinical decision making	Practical

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50.	MPT	Cardio-Respiratory Sciences - Clinical Sciences I	Anatomy & Physiology of Cardio-Pulmonary system in humans	Practical
51.	MPT	Cardio-Respiratory Sciences-Physiotherapeutics I	Interpret of investigations and to form ICF.	Case discussion
52.	MPT	Cardio-Respiratory Sciences - Recent Advances I	Create a physiotherapy management protocol based on recent advances	Case-scenario discussions
53.	MPT	General and Community Based Rehabilitation-Advanced Physiotherapeutics I	Use Recent Physiotherapeutic Technique/ approaches to treat patients with in Women's Health and Fitness	Practical
54.	MPT	General and Community Based Rehabilitation-Clinical Sciences I	Evaluate various gynaecological conditions like urogenital dysfunctions, pelvic organ prolapse, pelvic inflammatory disease, incontinence etc.	Practical
55.	MPT	General and Community Based Rehabilitation-Physiotherapeutics I	Design and depart exercise prescription in gynecological conditions like UV prolapse ,urinary incontinence in patients.	Case- presentation
56.	MPT	General and Community Based Rehabilitation-Recent Advances I	Design health camps ,awareness programs based on current health statistics for the rural and urban community	Community based practical activites
57.	MPT	General and Community Based Rehabilitation-Advanced Physiotherapeutics I	diagnosis and clinical reasoning based on evidence-based practice in the field of physiotherapy.	Practical
58.	MPT	Paediatrics - Clinical Sciences I	To gain knowledge related to embryology of nervous system, basic and applied neuroanatomy and neurophysiology.	PBL
59.	MPT	Paediatrics-Physiotherapeutics I	To acquire the skill; related to assessment and diagnose of all possible findings in pediatric congenital and acquired neurological conditions.	Clinical practice with case presentations
60.	MPT	Paediatrics- Recent Advances-I	To create awareness about recent researchers and their use in clinical setups with reference to paediatric rehabilitation.	PBL

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61.	MPT	Paediatrics-Advanced Physiotherapeutics I	Use Recent Physiotherapeutic Technique/ approaches to treat patients with disorders in different age groups.	Practical
62.	MPT	Musculoskeletal Sciences and Sports Clinical Sciences I	To identify, discuss & analyse, the Musculoskeletal dysfunction in terms of Biomechanical, Kinesiological and Biophysical basis & co-relate the same with the provisional diagnosis, routine radiological & Electro-physiological investigations with appropriate functional diagnosis and clinical reasoning	Case-discussion
63.	MPT	Musculoskeletal Sciences and Sports Physiotherapeutics I	Use Manual Therapy Technique/ approaches to treat patients with musculoskeletal disorders in different age groups	PBL
64.	MPT	Musculoskeletal Sciences and Sports Recent Advances I	Document patients with current version of scale, outcome measures and asses the progression	Practical
65.	MPT	Musculoskeletal Sciences and Sports Advanced Physiotherapeutics I	Discuss the recent management approaches for different musculoskeletal conditions and deliberate on best practice model for patient cantered care	Practical
66.	MPT	Musculoskeletal Sciences and Manual Therapy Clinical Sciences I	Be able to correlate neuromusculoskeletal system with clinical sign and symptoms along with Medical and Surgical Management	Discussion
67.	MPT	Musculoskeletal Sciences and Manual Therapy Physiotherapeutics I	Be able to provisional diagnose, routine radiological and Electro-physiological investigations with appropriate functional diagnosis & clinical reasoning	PBI
68.	MPT	Musculoskeletal Sciences and Manual Therapy Recent Advances I	Critically analyze different treatment and assessment procedures based on evidence for delivery of best patient care	Practical
69.	MPT	Musculoskeletal Sciences and Manual Therapy Advanced Physiotherapeutics I	Discuss recent management approaches for different musculoskeletal conditions in manual therapy and deliberate on best practice model for patient cantered care	Practical

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70.	MPT	Musculoskeletal Sciences and Hand Conditions Clinical Sciences I	Be able to identify, discuss & analyse, the Hand dysfunctions in terms of Biomechanical, Kinesiological and Biophysical basis & co-relate the same with the provisional diagnosis	Discussion
71.	MPT	Musculoskeletal Sciences and Hand Conditions Physiotherapeutics I	Be able to correlate neuromusculo skeletal system with clinical decision making	Practical
72.	MPT	Musculoskeletal Sciences and Hand Conditions Recent Advances I	Be able to identify, discuss & analyse, the Hand dysfunction based on evidence-based practice in the field of musculoskeletal physiotherapy.	PBL
73.	MPT	Musculoskeletal Sciences and Hand Conditions Advanced Physiotherapeutics I	Use Recent Physiotherapeutic Technique/ approaches to treat patients with hand disorders in different age groups.	Practical
74.	MPT	Orthopaedics - Clinical Sciences II	Be able to correlate neuromusculo skeletal system with clinical sign and symptoms along with Medical and Surgical Management	Case-discussions
75.	MPT	Orthopaedics - Physiotherapeutics II	Document patients with scale, outcome measures and asses the progression	PBL
76.	MPT	Orthopaedics-Recent Advances II	Be able to correlate neuromusculoskeletal system with Updated methods of clinical decision making	Practical
77.	MPT	Orthopaedics - Advanced Physiotherapeutics II	assessment procedures based on strong rationale and evidence for delivery of best patient care	Practical
78.	MPT	Neurosciences - Clinical Sciences II	Familiar with basic instruments used in clinical setups and their effective use in neuro rehabilitation.	Clinical discussion
79.	MPT	Neurosciences - Physiotherapeutics II	Plan a rehabilitation protocol ,implication of it effectively and understand the steps and duration of progression of the neuro rehabilitation protocols.	Practical
80.	MPT	Neurosciences - Recent Advances II	Discussion on Research, critical appraisal and its clinical implication for future excellence in patient care	PBL

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81.	MPT	Neurosciences-Advanced Physiotherapeutics II	Use Physiotherapeutic Technique/ approaches to treat patients with Neurological disorders in different age groups incorporate with Recent advances	Practical
82.	MPT	Cardio-Respiratory Sciences - Clinical Sciences II	Describe the pathophysiology, etiology, clinical features and impairments of cardiovascular conditions.	Discussion
83.	MPT	Cardio-Respiratory Sciences- Physiotherapeutics II	Interpret investigations and document as per ICF	Case-presentation
84.	MPT	Cardio-Respiratory Sciences- Recent Advances II	Critically evaluate recent articles related to the cardiovascular conditions	PBL
85.	MPT	General and Community Based Rehabilitation- Clinical Sciences II	Diagnose and analyze the clinical reasoning for condition like musculoskeletal, cardiovascular and psychological problems in geriatrics fitness	Discussion
86.	MPT	General and Community Based Rehabilitation- Physiotherapeutics II	Analyze the areas to organize awareness/ screening camp for geriatrics and industries.	Community postings and discussions
87.	MPT	General and Community Based Rehabilitation- Recent Advances II	Do competent evidenced based practice in geriatric and industrial health.	Practical
88.	MPT	General and Community Based Rehabilitation- Advanced Physiotherapeutics II	Discuss the recent management approaches for different age-related disorders and betterment of Industrial worker's health and deliberate on best practice model for patient centered care	Practical
89.	MPT	Paediatrics - Clinical Sciences II	Acquire knowledge related to amputation, limb deficiencies ,burns, tumours of bone and muscle in childhood-Classification, pathophysiology and management.	Case- discussions
90.	MPT	Paediatrics - Physiotherapeutics II	Explicit and perform the steps of each Paediatric approaches skilfully	Practical
91.	MPT	Paediatrics- Recent Advances II	Discussion and group studies about the merits and demerits of recent advances..	PBL

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92.	MPT	Paediatrics-Advanced Physiotherapeutics II	Use Recent Physiotherapeutic Technique/ approaches to treat patients with disorders in different Paediatric age groups.	Practical
93.	MPT	Musculoskeletal Sciences and Sports Clinical Sciences II	Apply scientific principles of clinical reasoning to assess, diagnose and manage musculoskeletal and sports injuries	Practical
94.	MPT	Musculoskeletal Sciences and Sports Physiotherapeutics II	Critically analyse the management approaches by referring to scientific literature	PBL
95.	MPT	Musculoskeletal Sciences and Sports Recent Advances II	Appraise the recent advancements in Physiotherapy practice and critically analyse and apply in domains of patient management	Case- presentation
96.	MPT	Musculoskeletal Sciences and Sports Advanced Physiotherapeutics II	Appraise the strength of scientific evidences in the advancements and comment on possible application into clinical practice	Practical
97.	MPT	Musculoskeletal Sciences and Manual Therapy Clinical Sciences II	Apply scientific principles of clinical reasoning to assess, diagnose and manage musculoskeletal and sports injuries manually	Practical
98.	MPT	Musculoskeletal Sciences and Manual Therapy Physiotherapeutics II	Assess the prognostic indicators within the scope of practice of manual Physiotherapy, prepare and implement the management approach	PBL
99.	MPT	Musculoskeletal Sciences and Manual Therapy Recent Advances II	Critically examine clinical decisions in light of new information and knowledge from the scientific literature	Case- presentation
100.	MPT	Musculoskeletal Sciences and Manual Therapy Advanced Physiotherapeutics II	Discuss, disseminate and document the advancements to innovate clinical and research practices	Practical
101.	MPT	Musculoskeletal Sciences and Hand Conditions Clinical Sciences II	Be able to correlate neuromusculoskeletal system with clinical decision making	Case- discussions
102.	MPT	Musculoskeletal Sciences and Hand Conditions Physiotherapeutics II	Document patients with scale, outcome measures and asses the progression	Practical

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103.	MPT	Musculoskeletal Sciences and Hand Conditions Recent Advances II	Be able to, discuss & analyse, the Musculo skeletal dysfunction in terms of updated recent developments in Biomechanical, Kinesiological and Biophysical basis & co-relate the same with the Recent Trends in provisional diagnosis, routine radiological & Electro-physiological investigations.	PBL
104.	MPT	Musculoskeletal Sciences and Hand Conditions Advanced Physiotherapeutics II	critically analyze different treatment and assessment procedures based on strong rationale and evidence for delivery of best patient care	Practical
105.	MPT	Research Dissertation (Viva)	Critically appraise the scientific literature and formulate a research question & Develop innovative ways to promote evidence based clinical practice	PBL

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Ref. No. : DYPV/CON/ 713A

Date : 05/9/2023

Criterion 1

Metric ID. 1.3.1

Sr. No.	Name of the Program	Name of the Course	Relevance to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values	Description of relevance to Gender/ Environment & Sustainability / Health determinants/ Emerging demographic changes/ Ethics/ Human values
1	BSC Nursing	Communicative English	Human value	In syllabus we taught how to communicate effectively with clients & other health team members while providing nursing care.
		Applied Anatomy	Gender	Seminar on male and female Reproductive systems.
			Ethics	Anatomy act
			Human Ethics	Organ donation program.
		Applied Physiology	Gender	Gender related topics such as physiology of reproductive systems are taught.
			Environment and sustainability	Proper disposal of biomedical hazard and waste management is done


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			Human Values	Counselling and interaction is done for the students as per the allotment of mentee.
		Applied Sociology	Gender	In syllabus we taught the relationship of the individual to the society.
			Environment and stability	In syllabus it include the social problems and its influence on social changes and the factors contributing to it.
			Human values	It includes positive attitudes towards individual, family and community
			Health determinant	It includes the structure and the dynamics of the society
		Psychology	Gender	In syllabus we taught the importance of psychology in personal and professional life.
			Environment and sustainability	In syllabus we taught the cognitive and affective processes of human mind
			Human value	Assessment done with psychological assessments and tests.
			Health determinants	It is taught to assist with psychological assessments and tests.

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			Right of Health Issue	To develops an understanding of self and others
		Nursing Foundation-I	Gender	Topic related to patients and families and team members to maintain effective human relation.
			Environment and sustainability	Knowledge on principles and techniques of infection control provided to group.
			Human value	Skill is taught in meeting basic psychosocial needs of the clients.
			Health determinants	Knowledge on concept of health, health -illness continuum and health care delivery system is taught.
			Right of Health Issue	Topics related to attitude to ethics and professional conduct.
		Applied Nutrition & Applied Dietetics, Applied Biochemistry	Gender	To plan diet for individual and group
			Human value	To Plan menu efficiently.

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			Health determinants	To Understand different types of nutrients, their importance, sources, functions and problems due to deficiency
			Right of Health Issue	To Apply the principles of food preparation in the practical field effectively.
		Nursing Foundation-II	Gender	Topic related to patients and families and team members to maintain effective human relation.
			Environment and sustainability	Knowledge on principles and techniques of infection control provided to group.
			Human value	Skill is taught in meeting basic psychosocial needs of the clients.
			Health determinants	Knowledge on concept of health, health -illness continuum and health care delivery system is taught.
			Right of Health Issue	Topics related to attitude to ethics and professional conduct.

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	Health/ Nursing informatics & technology	Professional Ethics	Helps students to update with Digitalization in Nursing
	Applied Microbiology	Environment and sustainability	It deals with interaction of microbes with environment
	Pharmacology,	Human value	In syllabus we taught the understand of drug acting on various systems of human body.
		Right of Health Issue	In syllabus it is taught the pharmacology of common chemotherapeutics.
	Pathology	Gender	In syllabus we taught diseases of male and female genital tract.
		Environment and stability	Biomedical waste is send for proper disposal.
		Human values	Students counselling and interaction done as per allotted mentee.
		Health determinant	Pathology syllabus includes study of disease and its clinical correlation, emphasis is given to etiology and pathogenesis and lab investigation for prevention of diseases.
	Genetics	Gender	In syllabus we taught genetic disorder in various age group.


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			Human values	In syllabus it includes d maternal, prenatal and genetic influences on development of defects and diseases
			Health determinant	Genetics syllabus includes basic concepts of genetics and significance of genetic counselling.
		Adult Health Nursing	Gender	Topic related to patients and families and team members to maintain effective human relation.
			Environment and sustainability	Knowledge on principles and techniques of infection control provided to group.
			Human value	Skill is taught in meeting basic psychosocial needs of the clients.
			Health determinants	Knowledge on concept of health, health -illness continuum and health care delivery system is taught.
			Right of Health Issue	Topics related to attitude to ethics and professional conduct.
		Professionalism professional values & ethics including bioethics	Gender	Topic related to patients and families and team members to maintain effective human relation.

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			Environment and sustainability	Knowledge on principles and techniques of infection control provided to group.
			Human value	Skill is taught in meeting basic psychosocial needs of the clients.
			Health determinants	Knowledge on concept of health, health -illness continuum and health care delivery system is taught.
			Right of Health Issue	Topics related to attitude to ethics and professional conduct.
		Medical Surgical Nursing -I	Gender	In syllabus it include disease Condition of female and male reproductive system.
			Health determinant	Syllabus includes describe the causes, signs and symptoms, treatment and prevention of medical surgical conditions.
			Right of Health Issue	Demonstrate skill in carrying out nursing techniques and procedures in keeping with scientific principles
		Community Health Nursing	Gender	It includes demography and family planning


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			Emerging demographic changes	Demography and family planning
			Human values	Health care of the community and health care services.
		Communication & Education Technology	Right of Health Issue	In syllabus Demonstrate teaching skills using various teaching methods in classroom, clinical and community setup using different methods and media.
			Human values	Establishes effective interpersonal and human relations with patients, families and health team members.
		Mental Health Nursing	Right of Health Issue	In this syllabus it include psychiatric patient as an individual and develop a deeper insight into her own attitudes and emotional reactions.
			Human values	In syllabus it includes Understand the importance of community health nursing in psychiatry.
		Child Health Nursing	Gender	In syllabus includes concept of child care and the principles of child health nursing.



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			Right of Health Issue	In syllabus it include the various preventive, promotive and rehabilitative aspects of child care and apply them in providing nursing care to children in the hospital and in the community.
		Nursing Research & Statistics	Human values	In syllabus it includes sample and sampling technique.
		Midwifery/Obstetrics & gynaecology nursing	Gender	In syllabus it includes study of Female reproductive system
			Right of Health Issue	It include safe management of all stages of labour.
			Human values	In syllabus it include to motivate the mother for care of the baby and adapting the family planning methods to maintain small family norms.
		Management of Nursing Service & Education	Right of Health Issue	It includes problems and issues related to administration of nursing curriculum development.


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		Advance Nursing Practice	Right of Health Issue	It includes holistic and competent nursing care following nursing process.
	NPCC	Theoretical Basis for Advanced Practice Nursing	Human value	Skill is taught in meeting basic psychosocial needs of the clients.
			Health determinants	Knowledge on concept of health, health -illness continuum and health care delivery system is taught.
			Right of Health Issue	Topics related to attitude to ethics and professional conduct.
		Research Application and Evidence Based Practice in critical care	Gender	Topic related to patients and families and team members to maintain effective human relation.
			Human value	Skill is taught in meeting basic psychosocial needs of the clients.
			Right of Health Issue	Topics related to attitude to ethics and professional conduct.

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	Advanced skills in Leadership, Management and teaching skills	Right of Health Issue	It includes problems and issues related to administration of nursing curriculum development.
	Advanced Pathophysiology applied to Critical Care	Human value	In syllabus we taught the understand of drug acting on various systems of human body.
		Right of Health Issue	In syllabus it is taught the pharmacology of common chemotherapeutics.
	Advanced Pharmacology applied to Critical Care	Human value	In syllabus we taught the understand of drug acting on various systems of human body.
		Right of Health Issue	In syllabus it is taught the pharmacology of common chemotherapeutics.
	Advanced Health/physical Assessment	Gender	Topic related to patients and families and team members to maintain effective human relation.
		Environment and sustainability	Knowledge on principles and techniques of infection control provided to group.
		Human value	Skill is taught in meeting basic psychosocial needs of the clients.

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			Health determinants	Knowledge on concept of health, health -illness continuum and health care delivery system is taught.
			Right of Health Issue	Topics related to attitude to ethics and professional conduct.
		Foundations of Critical Care Nursing Practice	Human value	Skill is taught in meeting basic psychosocial needs of the clients.
			Right of Health Issue	Topics related to attitude to ethics and professional conduct.
		Critical Care Nursing I	Human value	Skill is taught in meeting basic psychosocial needs of the clients.
			Health determinants	Knowledge on concept of health, health -illness continuum and health care delivery system is taught.
			Right of Health Issue	Topics related to attitude to ethics and professional conduct.
		Critical Care Nursing II	Human value	Skill is taught in meeting basic psychosocial needs of the clients.
			Health determinants	Knowledge on concept of health, health -illness continuum and health care delivery system is taught.
			Right of Health Issue	Topics related to attitude to ethics and professional conduct.

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Dr. P. D. Patil
Chancellor

Dr. (Mrs.) Smita Jadhav
Trustee

Dr. D. B. Sharma
Principal

Ref:

DYPHMCRC

Outward No. 348C

Date 19/7/23

Date:

19/7/23

Metric ID: 1.3.1 Description of the courses which address crosscutting issues in the curricula.

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1.	BHMS	Anatomy	Gender	Seminars on male and female reproductive systems.
			Ethics	Anatomy Act
			Human values	Awareness regarding Organ and Body Donation
2.	BHMS	Physiology	Gender	Gender — Gender related topics such as physiology of reproductive system are taught.
			Environment and sustainability	Environment and sustainability— Proper disposal of biomedical hazard and waste management is done with the help of PASSCO.
			Human Values	Human Values— Counselling and interaction is done for the students as per the allotments of mentee.
			Health Determinants	Health Determinants— Health education is conducted and is included in curriculum and topics related to health



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				determinants are conducted such as Problem based Learning and Applied Physiology.
			Right To Health Issue	Right To Health Issue— Topics related to food such as nutrition, balanced diet and vitamins are included in curriculum to ensure adequate of health and wellbeing of individual.
3.	BHMS	Homoeopathic Pharmacy	Ethics/ Human Values	Homoeopathic Practitioner's Professional Conduct, Etiquette and Code of Ethics is included in the curriculum and syllabus of Homoeopathic Pharmacy up and above the requirement of NCH. It is taught in integration with Forensic Medicine and Toxicology.
4.	BHMS	Pathology	Gender	- In syllabus we taught diseases of male genital tract and female genital tract.
			Environment and Sustainability	Biomedical waste is sent to PASSCO for proper disposal.
			Human Values	Student counseling and interaction done as per allotment of mentees to departmental staff.
			Health Determinant	Pathology syllabus includes study of diseases and its clinical correlation, emphasis is given to etiopathogenesis and lab investigation for prevention of diseases. In practical's clinical correlation and indication is taught in detail. Participation in extension and outreach activities by departmental staff member.



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5.	BHMS	Forensic Medicine and Toxicology	Gender	A webinar on 'Medicolegal Termination of Pregnancy Act'' was scheduled.
			Ethics	A webinar on 'Medico Legal certificates in Medical Practice' was conducted on the 20 th of April, 2022 to create sensitization amongst medical practitioners regarding writing of medico legal certificates.
6.	BHMS	Homoeopathic Materia Medica	Gender/ Health determinants/ Ethics/ Human values	GENDER-Topics & diseases related to the female reproductive health are covered during the clinical teaching with the homoeopathic approach Health determinants-as per the curriculum. Professional Ethics - Developing knowledge, clinical skills & assisting clinicians to acquire competency in communication, ethics, and behavioral skills. Doctor- patient relationship is respected & protected Human values -Lecture on code of conduct & professional ethics is emphasized during pre- clinics. Counselling & interaction with the patients is taught during the clinical teaching in OPD & IPD



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	M.D. (Hom.)	Homoeopathic Materia Medica	Gender/ Health determinants/ Ethics/ Human values	GENDER-Topics & diseases related to the female reproductive health are covered during the clinical teaching with the homoeopathic approach Health determinants-as per the curriculum. Professional Ethics - Developing knowledge, clinical skills & assisting clinicians to acquire competency in communication, ethics, and behavioral skills. Doctor-patient relationship is respected & protected Human values -Lecture on code of conduct & professional ethics is emphasized during pre-clinics. Counselling & interaction with the patients is taught during the clinical teaching in OPD & IPD
7.	BHMS	Organon of Medicine with Homoeopathic Philosophy- I BHMS BH 105	Health determinants Ethics	Health Determinants: <ul style="list-style-type: none"> ➤ Cardinal Principles Of Homoeopathy ➤ Concepts Of Health Disease And Cure ➤ Aphorism 3: Knowledge Of Physician Ethics: <ul style="list-style-type: none"> ➤ Aphorism 1: The mission of physician ➤ Aphorism 26: Therapeutic law of nature
	BHMS	Organon of Medicine with Homoeopathic Philosophy- II BHMS BH 204	Health determinants Ethics Human values	Health Determinants: <ul style="list-style-type: none"> ➤ Evolution of Disease, with causation ➤ Case taking and case-processing ➤ Aphorism 29: Modus operandi of homoeopathic cure ➤ Aphorism 71: Three points necessary for cure ➤ Principles and Art of cure by Homoeopathy by H. A. Roberts: Role of vital force in health,



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				<p>disease, cure and recovery</p> <ul style="list-style-type: none"> ➤ The Genius of Homoeopathy by Stuart Close: Cure and Recovery <p>Ethics:</p> <ul style="list-style-type: none"> ➤ Lectures on Homoeopathic Philosophy by Dr. J. T. Kent: Record keeping <p>Human values: Case-taking aphorisms:83-104</p>
BHMS	Organon of Medicine with Homoeopathic Philosophy- III BHMS	Health determinants Ethics		<p>Health Determinants:</p> <ul style="list-style-type: none"> ➤ Aphorisms 148: Modus operandi of homoeopathy ➤ Aphorism 264-269: Selection of genuine medicine ➤ Lectures on Homoeopathic Philosophy by Dr. J. T. Kent: Prognosis after observing the action of the remedy ➤ Principles and Art of cure by Homoeopathy by H. A. Roberts: Law of cure <p>Ethics: The Genius of Homoeopathy by Stuart Close: Potentiation & infinitesimal dose, Law of least action</p>
BHMS	Organon of Medicine with Homoeopathic Philosophy- IV BHMS BH 403	Health determinants Ethics Human values		<p>Health Determinants:</p> <ul style="list-style-type: none"> ➤ The Genius of Homoeopathy by Stuart Close: -Life, Health And Disease -The Scope of Homoeopathy ➤ Lectures on Homoeopathic Philosophy by Dr. J. T. Kent: Disease and drug disease in general ➤ Principles and Practice of Homoeopathy by Richard Hughes: The Selection Of The Similar



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				<p>Remedy</p> <p>Ethics:</p> <p>➤ Homoeopathy, the science of Therapeutics by C. Dunham</p> <p>Human values:</p> <p>➤ Principles and Art of cure by Homoeopathy by H. A. Roberts: What Has Homoeopathy to Offer the Young Man?</p>
	M.D. (Homoeopathy)	Homoeopathic Philosophy Part-I MDH 104	Health determinants Ethics Human values	<p>Health Determinants:</p> <p>Concept of Medical Observer and Unprejudiced observer</p> <p>Evolutionary study of Principle of Similia, Vital Principle, Posology and its Scientific application in Homoeopathy</p> <p>Concept of Symptomatology, Susceptibility, Suppression and its importance in Totality formation</p> <p>Evolutionary study importance in Health, Constitution, Diathesis, Disease, Recovery, Cure, Drug-effects, Remedy-effects, Suppression and Palliation, Local Application and Remedy-Reaction</p> <p>Concept of Non remedial, ancillary methods in treatment of diseases</p> <p>Role of Control Systems (Psycho-Neuro-Endocrine axis and the Reticulo-endothelial System) in the maintenance of Health and initiating the process of breakdown and onset of illness</p> <p>Ethics:</p>



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				<p>Procedure to design study for his research</p> <p>Human values: Different components which influence health at individual, family and community level leading to insight into preventive and community medicine through Hahnemannian philosophy of holistic care</p>
	M.D. (Homoeopathy)	Homoeopathic Philosophy Part-II MDH 202	Health determinants Ethics Human values	<p>Health Determinants: Man in Health, Constitution, Diathesis, Disease, Recovery and Cure Study of the Hahnemann's chronic diseases with specific emphasis on applicative aspects of Minimum dose, potency scales, miasms, cure, recovery, suppression, prevention of diseases. Clinical Classification and Identification of the Four Miasmatic Types, Combination of Miasms: Concept, Implications and Identification with emphasis on practical utility and application. In depth study of Remedy Administration: Potency-selection, Repetition, Second Prescription, Susceptibility, Placebo and Remedy Relationship, Palliation, suppression, recovery and cure</p> <p>Ethics: Principles of Bioethics in Homoeopathic Philosophy</p> <p>Human values: Student must develop skills of case taking to comprehend his patient as a person as a whole, his dispositional state of Mind and Body, along with the disease process with its causes.</p>
8.	BHMS	Gynaecology and Obstetrics	Gender/ Environment & Sustainability / Health	Activities for gender equality were conducted on



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			determinants/ Emerging demographic changes/ Ethics/ Human values	the occasion of International Women's Day 2021. Health check-up and homoeopathic medical camp was conducted on 8 March 2021. Total patients seen were 71. Lectures were conducted on the topics related to health determinants, right to health issues. Professional Ethics related topics were conducted in lecture and clinic sessions.
9.	BHMS	Surgery	Ethics/ Human values Environment & Sustainability	Creating Awareness about Medical ethics and Human values, also disposal of waste for safe environment is done routinely in lectures and clinics conducted for II & III BHMS
10.	BHMS	Practice of Medicine	Environment & Sustainability / Health determinants/ Ethics/ Human values	Celebration of National and International days related to Medical subjects for sensitizing the students. Talks/Seminars by the experts of the concerned fields. Various health checkup, screening, treatment camps for the students and society. Case based teaching and training to improvise interaction of students with patients so as to enable them with the art of communication and make them a sensitive & sensible physician who respects ethics and human values.
11.	BHMS	COMMUNITY MEDICINE- BH-307	Environment & Sustainability Health determinants Ethics	1.ENVIRONMENT AND SUSTAINABILITY- Chapter 14- Environment and Health. Topic - Entire Chapter, page no. 765-848. 2.HEALTH DETERMINANTS- Chapter 02- Concept of Health and Disease. Topic - Determinants of Health, page no. 18



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				<p>3.PROFESSIONAL ETHICS Chapter 02 - Concept of Health and Disease. Topic-Functions of Physician, page no. 55</p>
	BHMS	COMMUNITY MEDICINE- BH-405	Gender Emerging demographic changes Human values	<p>1.GENDER - Chapter 09- Demography and family planning. Topic - Sex ratio, page no. 534 Chapter 10-Preventive Medicine in Obstetrics, Paediatrics and Geriatrics Topic- Rights of the Women and Children-page no-603/604 Topic- Girl Child and Gender Bias ,page no. 640</p> <p>2.EMERGING DEMOGRAPHIC CHANGES - Chapter 09 - Demography and Family planning Topic –Demography and Family planning Page No.530</p> <p>3.HUMAN VALUES - Chapter 10- Preventive medicine in Obstetrics, Pediatrics and Geriatrics. Topic - Rights of Mother and Children, page no. 603 Chapter 23- Health Care of the Community. Topic -Health Care Services, page no. 958</p>
12.	BHMS	Repertory	Gender	<p>Gender-related topics are taught in respective courses. Gynecological cases are discussed and repertorize in III BHMS and IV BHMS courses. Participation of departmental staff in Health camps regularly on the International Woman Day.</p> <p>Departmental staff participates in the lectures arranged by Gynecology dept on occasion of international Woman Day</p> <p>Departmental staff participated in Woman</p>



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				Empowerment Programme Organized by DPU. Departmental staff is 1:4 as employee.
			Environment and Sustainability	Environment and Sustainability: Departmental Staff participate in Health checkup and homoeopathic medical camps especially related to the epidemiological diseases and routine checkup of the people of society especially in "Pandharpur wari" Utility of Computer repertorization for IV BHMS, Interns and PG students to have paperless activity. Online assessment method has been used to avoid paper use for examinations.
			Human Values	Students' counseling and interaction as per allotment of Mentees to all departmental staff All departmental staff shall (wherever applicable) be responsible for proper care of O.P.D. / I.P.D. patients including emergency duties as per the respective council norms.
			Health Determinants	In Repertory subject syllabus, Clinical teaching includes study of patients in IPD and OPD including their case working and case presentations. Clinical batches are engaged with health checkup camps organized by college inside and outside the premises. Participation in Extension and outreach



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				activities by departmental staff members.
M.D. (Homoeopathy)	Repertory MD part II	Related to Health determinants, Right to health issues, Human values, Professional ethics, Gender	In Repertory subject syllabus it includes concept of Repertorization and historical evolution of Repertory. Case Receiving its Principle and Techniques in various departments eg. Medicine, Gynecology, pediatrics, skin etc.	
M.D. (Homoeopathy)	Repertory MD Part II	Related to Health determinants, Right to health issues, Human values, Professional ethics, Gender, Environment and sustainability	In Repertory subject syllabus it includes integration teaching of homoeopathic management w.r.t Materia medica and Homoeopathic philosophy. Merits, concept and methods of unprejudiced observation. Introduction to principles of Bioethics. Art science of case recording. Approaches and its Principle and Techniques in various departments eg. Medicine, Gynecology, pediatrics, skin etc. Application of all Repertories in clinical practice.	



Dean/ Director/ Principal

(Sign and Stamp)

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Trustee

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Principal

Ref. No: DYPCARC/IQAC 595 B /2023

Date : 19/07/23


Description of the courses which address Gender issues, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging demographic changes and Professional Ethics in the Curricula

Sr. No	Name of Programme	Name of Course	Description of course which addresses Gender issues/ Environment and Sustainability / Human Values/ Health determinants/ Professional ethics	List of Topics covered under Gender issues/ Environment and Sustainability / Human Values/ Health determinants/ Professional ethics
1.	B.A.M.S.	Samhita Adhyayana - I	Human values, Ethics It includes daily regimen, seasonal regimen, behavioral code & conducts & meal etiquette.	This course helps the students to give advice for Health and lifestyle management through Dinacharya, Rutucharya, Sadvrutta etc and select appropriate Panchakarma procedures in healthy and diseased conditions.
2.	B.A.M.S.	Charak Samhita (Purvardha)	Human values, Ethics	This course helps the students to demonstrate ayurvedic fundamentals of nidana (diagnosis) with the help of complete and thorough knowledge. It also help to students in understanding of diet, hygienic, prevention, medical education, Indian traditional medicine and the team work of physician, nurse and patients necessary for recovery to health.
3.	B.A.M.S.	Dravyaguna Vidnyana	Environment & Sustainability	This course helps the students to understand basic cultivation, propagation & collection practices of herbs and able to identify medicinal plants & drugs along with their properties, doses, side effects, allergic reaction, antidotes and purification of poisonous drugs and also pharmacognosy, pharmacology and therapeutic uses of the plants.
4.	B.A.M.S.	Agad Tantra	Ethics & Gender	This course helps the students to should have comprehensive knowledge about aspects of unnatural deaths, updated knowledge of law and negligence in



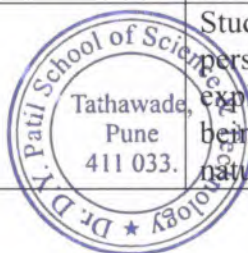
				relation to practice medicine and be able to identify Medico legal cases and gender wise differentiation.
5.	B.A.M.S.	Roga Nidan & Vikruti Vidnyana	Health determinants , Environment & Sustainability	This course helps the students to understand nutritional disorders- disorders of macro and micronutrients.. Environmental disorders and their diagnosis.
6.	B.A.M.S.	Swasthavritta & Yog	Environment & Sustainability, Health determinants , Emerging demographic changes	This course helps the students to apply the knowledge related to non-communicable diseases, pandemics, environmental health care and primary healthcare needs. School health service, biomedical waste management and occupational health.
7.	B.A.M.S.	Charak Samhita (uttarardha)	Human values, Ethics	This course helps the students to Express comprehensive knowledge of rasayan and vajikaramn from preventive and curative aspect. Diagnose (nidan) and manage (chikitsa)of various diseases on the basis of ayurvedic principles. Follow authentic and ethical guidelines of drug formulation and treatment procedure.
8.	B.A.M.S.	Kayachikitsa	Human values, Ethics, Health determinants ,	This course helps the students to carry out quick assessment of patient on the basis of available clinical and investigational information as well as socio-economic and emotional determinants and its efficient management and provides life style interventions and natural therapies to regain a balance between the body, mind, spint and environment
9.	B.A.M.S.	Shalakya Tantra	Environment & Sustainability, Health determinants	This course helps the students to apply basic Concepts of Shalakya Tantra, Ophthalmology, ENT & Dentistry in context to the health needs of the community National Programme for prevention and control Deafness and able to create community awareness regarding prevention of diseases
10	B.A.M.S.	Research & methodology	Ethics	This course helps the students to apply Basic concepts of Research and Medical Statistics. Evidence based medicine and Scientific Writing.
11	B.A.M.S.	Streerog & Prasuti tantra	Gender	This course helps the students to understand assessment of patient on the basis of available clinical and investigational information as well as socio-economic and emotional determinants and its efficient management of infertility through ayurveda therapy Reproductive and child health program. Implementation of garbhasanskar during pregnancy for healthy progeny.




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1.3.1 Description of courses that integrate crosscutting issues relevant to Gender, Environment and Sustainability, Human Values, Health Determinants, Right to Health Issues, Emerging demographic changes and Professional Ethics in the curricula

Sr. No.	Name of the Program	Name of Course	Relevance to Gender/Environment and Sustainability/Human Values/ Health Determinants/ Right to Health Issues/ Emerging demographic changes and Professional Ethics	Description of relevance to Gender/Environment and Sustainability/Human Values/ Health Determinants/ Right to Health Issues/ Emerging demographic changes and Professional Ethics
1	BTAI&DS	Fundamentals of programming Languages ESC 102	Professional Ethics	Students will get knowledge about the concepts and significance of computer programming
2	BTAI&DS	Communication Skills HSMC 101	Human Values	Students will be able to communicate better and will be able to develop good human values
3	BTAI&DS	Problem Solving by Programming ESC 201	Professional Ethics	Students will get knowledge about the concepts and significance of computer programming
4	BTAI&DS	General Biology BSC 202	Right to Health Issues	Students can have updated information about the recent trends in biology
5	BTAI&DS	Project Based Learning –I ESC 204	Professional Ethics	Students will get knowledge about the fundamentals of software development & project management
6	BTAI&DS	Workshop and manufacturing practices-laboratory ESC 205	Professional Ethics	Students will understand the construction and working of machine tools and functions of its parts.
7	BTAI&DS	Project Based Learning-II PCC-AI 304	Professional Ethics	Students will get deep understanding about the software development & project management using current trends in IT.
8	BTAI&DS	Universal Human Values-II HSMC 201	Human Values	Students will develop a holistic perspective based on self-exploration about themselves (human being), family, society and nature/existence.





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9	BTCSD	Fundamentals of programming Languages ESC 102	Professional Ethics	Students will get knowledge about the concepts and significance of computer programming
10	BTCSD	Communication Skills HSMC 101	Human Values	Students will be able to communicate better and will be able to develop good human values
11	BTCSD	Problem Solving by Programming ESC 201	Professional Ethics	Students will get knowledge about the fundamentals of software development & project management
12	BTCSD	General Biology BSC 202	Right to Health Issues	Students can have updated information about the recent trends in biology
13	BTCSD	Project Based Learning –I ESC 204	Professional Ethics	Students will get knowledge about the fundamentals of software development & project management
14	BTCSD	Workshop and manufacturing practices-laboratory ESC 205	Professional Ethics	Students will understand the construction and working of machine tools and functions of its parts.



Mrs Akanksha Goel
IQAC Coordinator