Inter Disciplinary Baskets for 4 year UG Programs (2025-26)

Basket No	Inter Disciplinary Basket	Course Code	Course Name
Basket A	**Natural and Physical Sciences**	GE1B-01	Medical Microbiology
		GE1B-02	Biochemistry & Nutrition
		GE1B-03	Earth Science
		GE1B-04	Fundamentals of Space Science
		GE1B-05	Basics of Human Genetics
		GE1B-06	Fundamentals of marine science
		GE1B-07	Basics of Evolutionary Biology
		GE1B-08	Introduction to Interdisciplinary Health Science
Basket D	**Library, Information and Media Sciences**	GE2B-01	A Hand on Study on Film
		GE2B-02	Digital Photography Basics and Beyond
		GE2B-03	Cinema and Other Arts
		GE2B-04	Understanding Visual Design Aesthetics
		GE2B-05	Study of Performing Arts
		GE2B-06	The Language of Graphic Design: Basics and Beyond
Basket B	**Mathematics, Statistics, and Computer Applications**	GE3B-01	IT Literacy
		GE3B-02	Basic Mathematics & Statistics
		GE3B-03	Business Research Methods: Tool &T echniques
		GE3B-04	Mathematics for Computing
		GE3B-05	Probability & Statistics
		GE3B-06	Bio Statistics
		GE3B-07	Data Analysis with R
		GE3B-08	Learn Programming Fundamental with C
		GE3B-09	Programming with Python
		GE3B-10	Code in with Java
		GE3B-11	Computer Graphics
		GE3B-12	Computer Basics and Multimedia Software
		GE3B-13	Data Analysis with SPSS
Basket E	**Commerce and Management**	GE4B-01	Entrepreneurship Theory & Practice
		GE4B-02	Accounting
		GE4B-03	Principles of Management & Organizational Behaviour
		GE4B-04	Basics of Accounting & Finance in Healthcare Management
		GE4B-05	Marco Economics in Business
		GE4B-06	Business Regulatory Framework
		GE4B-07	Decision Support System
		GE4B-08	Entrepreneurship: Launching an Innovative Business

		GE4B-09	Handling Human Resources In Workplace
		GE4B-10	Social Media Management, Advertising & Marketing
		GE4B-11	E-Commerce & M-Commerce
		GE4B-12	Digital Transformation& Industry4.0
Basket C	**Emerging Tech, Innovation & Others**	GE5B-01	Study of Textiles
		GE5B-02	Introduction to Hospitality Industry and Major Departments
		GE5B-03	Health Education & Communication
		GE5B-04	Hospital Support Services
		GE5B-05	Blockchain Technology
		GE5B-06	Introduction to 3D printing Technology
		GE5B-07	Advances in Medical Technologies
		GE5B-08	Fundamentals of IOT
		GE5B-09	Basics of Prescription reading and Medical Transcription
		GE5B-10	Fundamental of Bioinformatics
Basket F	**Humanities and Social Sciences**	GE6B-01	Indian Constituency
		GE6B-02	Economics
		GE6B-03	Mind and Measurement
		GE6B-04	Sustainability & Fashion
		GE6B-05	Indian History & Culture
		GE6B-06	Values & Ethics
		GE6B-07	Enhancing Linguistic Competence & Developing Literacy Skills
		GE6B-08	Medical Ethics, Law and Etiquette
		GE6B-09	Law and Ethics
		GE6B-10	Surface & Soft Furnishings Design Development Techniques
		GE6B-11	Design and Human Evolution

(GE1B-01): MEDICAL MICROBIOLOGY

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. The objective of this course is that after 50 hours of lectures and demonstrations in addition to clinical practice, the student will be able to understand the causes, findings, investigations, and management in relation to physiotherapy.
2. To understand various pathological conditions due to bacteria.
3. To understand viruses.
4. To understand various pathological conditions due to viruses.

Course Outcomes (CO):

Sl. No.	Course Outcome	Mapped Modules
1	The course will enable students to understand the conditions in Microbiology and its application in relation with physiotherapy.	Module I – Unit 1
2	Students will learn various pathological conditions due to bacteria.	Module I – Unit 2
3	After studying this course, the students will understand various pathological conditions and their causative organisms.	Module II – Unit 3
4	Students will learn various pathological conditions due to viruses.	Module II – Unit 4

Detailed Syllabus:

Module I

Unit 1: Bacteria **[20L]**

- Cell structure, classification of bacteria.
- Staining reactions – gram staining, spore staining, acid-fast staining.
- Bacterial growth – nutritional requirements, physical factors affecting growth.
- Culture media, growth curve.
- Bactericidal agents – phenol, alcohol, etc.
- Sterilization – principles, types, methods.

Unit 2: Outline of the bacteria causing the following diseases **[5L]**

- RTI
- Meningitis
- Enteric infection
- Anaerobic infection
- UTI
- Leprosy
- TB
- STD
- Wound infection
- Hospital-acquired infection

Module II

Unit 3: Virus **[15L]**

- Elementary knowledge of viral morphology.
- Viral genome and classification.
- Viral replication.

Unit 4: Outline of the virus causing the following diseases **[5L]**

- HIV
- Hepatitis
- Polio
- Measles
- Rubella
- Herpes

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	CO Covered	PO Covered	Bloom's Level (If applicable)	Remarks (If any)
Module I Unit 1	Bacteria	20	40	1	4		
Module I Unit 2	Outline the Bacteria Causing the Following Diseases	5	10	2	4		
Module II Unit 3	Virus	15	40	3	4		
Module II Unit 4	Outline the Virus Causing the Following Diseases	5	10	4	4		

Suggested Readings:

1. Essentials of Medical Microbiology – Sastry Apurba S. and Bhat Sandhya
2. The Short Textbook of Medical Microbiology – Satish Gupte
3. Jawetz, Melnick & Adelberg's Medical Microbiology – Stefan Riedel, Stephen Morse, et al.
4. A Textbook of Microbiology – P. Chakraborty

(GE1B-02): BIOCHEMISTRY & NUTRITION

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. Understand the concept of solutions and how pH buffers work.
2. Comprehend aspects of various nutrients and their preventive effects.
3. Study the cell and its structure.
4. Obtain knowledge on nutrition and its functions.
5. Gain a detailed understanding of nucleic acids and enzymes.
6. Develop knowledge of biological oxidation.
7. Understand the process of metabolism of different energy substances.
8. Understand general mechanisms of tissues and metabolism.
9. Differentiate regulation and production of different hormones.

Course Outcomes (CO):

Sl. No.	Course Outcome	Mapped Modules
1	Ability to understand the concept of solutions and how pH buffers work.	Module I – Unit 1
2	Ability to understand the aspects of various nutrients and their preventive effects.	Module I – Unit 2
3	Ability to define cell and its structures.	Module I – Unit 3
4	Ability to gain knowledge on nutrition and its function.	Module I – Unit 4
5	Ability to get an idea on nucleic acids and enzymes.	Module II – Unit 5
6	Ability to define biological oxidation.	Module II – Unit 6
7	Ability to understand the process of metabolism of different energy substances.	Module II – Unit 7
8	Ability to define general mechanism of tissues and metabolism.	Module II – Unit 8
9	Ability to differentiate regulation and production of different hormones.	Module II – Unit 9

Detailed Syllabus:

Module I

Unit 1: Biophysics **[5L]**
Concepts of pH and buffers, Acid-base equilibrium, osmotic pressure and its physiological applications.

Unit 2: Nutrition & Prevention **[5L]**
Nutritional aspects of carbohydrates, fats, and proteins. Balanced diet, metabolism in exercise and injury, Diet for chronically ill and terminally ill patients

Unit 3: Cell Organelle **[5L]**
Morphology, structure and functions of cell: cell membrane, nucleus, chromatin, mitochondria, endoplasmic reticulum, ribosome.

Unit 4: Introduction to Nutrition **[5L]**
Definition, functions, sources, and classification of carbohydrates, lipids, proteins, and vitamins. Importance of essential fatty acids, blood lipids, cholesterol, Physiological functions and deficiency diseases of vitamins (fat-soluble and water-soluble).

Unit 5: Nucleic Acid & Enzymes **[5L]**
Structure and functions of DNA, RNA, nucleosides, nucleotides, biologically important nucleotides (energy-rich compounds). Enzyme definition, classification, mode of action, factors affecting enzyme action.

Module II

Unit 6: Biological Oxidation **[5L]**
Respiratory chain and process of biological oxidation.

Unit 7: Metabolism of Energy Substances **[5L]**
Carbohydrate, lipid, protein, and mineral metabolism, Glycolysis, TCA cycle, glycogenesis, glycogenolysis, gluconeogenesis, blood glucose regulation, cholesterol metabolism, ketone bodies, atherosclerosis, obesity. Amino acid metabolism, urea synthesis, creatinine synthesis, inborn errors of metabolism, Mineral metabolism (iron, calcium, phosphorus, trace elements).

Unit 8: Metabolism & Types of Tissues **[5L]**
Mucopolysaccharides, connective tissue proteins, glycoproteins, bone and teeth metabolism, skin metabolism, nerve mediators, muscle metabolism and contraction.

Unit 9: Regulation & Production of Hormones **[5L]**
Characteristics and mechanism of hormone action, Hormones of pancreas, thyroid, parathyroid, adrenal cortex, and sex hormones.

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	CO Covered	PO Covered	Bloom's Level	Remarks
Module I Unit 1	Biophysics	5	9	1	4		
Module I Unit 2	Nutrition & Prevention	5	8	2	4		
Module I Unit 3	Cell Organelle	5	9	3	4		
Module I Unit 4	Introduction to Nutrition	5	17	4	4		
Module I Unit 5	Nucleic Acids & Enzymes	5	8	5	4		
Module II Unit 6	Biological Oxidation	5	9	6	4		
Module II Unit 7	Metabolism of Energy Substances	5	16	7	4		
Module II Unit 8	Metabolism & Tissues	5	16	8	4		
Module II Unit 9	Regulation & Hormones	5	8	9	4		

Suggested Readings:

1. Chatterjee, M.N. – Textbook of Biochemistry. Jaypee Brothers.
2. Vasudevan, D.M. – Textbook of Biochemistry for Medical Students. Jaypee Brothers.
3. Marshall & Bangert – Clinical Biochemistry: Metabolic & Clinical Aspects. Churchill Livingstone.
4. B. Srilakshmi – Dietetics. New Age International Publishers.
5. B. Srilakshmi – Nutrition Science. New Age International Publishers.

(GE1B-03): EARTH SCIENCE

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To help understand the formation of Earth and its plates.
2. To understand the elements of climate and meteorology.
3. To gather knowledge about hydrology.
4. To provide understanding of natural hazards.

Course Outcomes (CO):

Sl. No.	Course Outcome	Mapped Modules
CO1	Concepts of formation of Earth & tectonic plates	M1
CO2	Brief idea about the elements of climate	M2
CO3	Knowledge about climatology & meteorology	M2
CO4	Concept of Hydrology	M3
CO5	Concept of Natural Hazards	M4

Detailed Syllabus:

Module 1: Earth Processes **[10 L]**

- Origin and formation of the Earth
- Plate tectonics
- Earth surface processes
- Rocks and minerals

Module 2: Climatology & Meteorology **[15 L]**

- Elements of climate
- Weather phenomena
- Meteorology
- Hydrometeorology
- Climate

Module 3: Hydrology **[15 L]**

- Introduction to oceanography
- Ocean currents
- Hydrology
- Hydrogeology

Module 4: Natural Hazards **[5 L]**

- Introduction to natural hazards
- Geological hazards
- Hydrological hazards

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	Bloom's Level	Remarks
M1	Earth Processes	10	20	1, 2, 3	NA
M2	Climatology & Meteorology	15	40	1, 2, 3	NA
M3	Hydrology	15	30	1, 2, 3	NA
M4	Natural Hazards	5	10	1, 2, 3	NA
Total		**45**	**100**		

Suggested Readings:

1. Lutgens, F.K., Tarbuck, E.J., & Tasa, D.G. – Foundations of Earth Science (8th Edition)
2. Lal & Panna – Fundamentals of Earth Science. Anmol Publishers
3. Vikram Singh & Rajesh – Book of Earth Science (1st Edition)
4. K. Siddhartha – Climatology: Atmosphere, Weather, Climate
5. O.P. Gupta – Elements of Environmental Pollution Control
6. M.P. Poonia, S.C. Sharma, & Santosh Kumar – Environmental Studies
7. M.P. Poonia, S.C. Sharma, & Santosh Kumar – Environmental Engineering

(GE1B-04): FUNDEMENTALS OF SPACE SCIENCE

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To help understand the solar system and planets.
2. To provide knowledge about space physiology.
3. To create knowledge about black holes, Milky Way, and other galaxies.
4. To create knowledge about radio telescopes.

Course Outcomes (CO):

Sl. No.	Course Outcome	Mapped Modules
CO1	Explain in detail the solar system and planets.	M1
CO2	Understand the effect of gravitation and Earth's rotation.	M1
CO3	Explain cardiovascular, neuromuscular, and psychological changes in space.	M2
CO4	Understand life support systems in space.	M2
CO5	Impart knowledge about the Milky Way and black holes.	M3
CO6	Understand the use of radio telescopes.	M3

Detailed Syllabus:

Module 1: Solar System Overview **[15 L]**

- Explore the solar system: sun, planets, moon, asteroids, comets, and meteoroids.
- Effects of Earth's rotation and revolution.
- Moon phases: waxing, waning, and lunar cycle.
- How gravity, the sun, and the moon influence tides.

Module 2: Space Life **[20 L]**

- Introduction to space life sciences.
- The neurosensory system in space.
- The cardiovascular system in space.
- The musculoskeletal system in space.
- Psychological issues of spaceflight.
- Life support system.

Module 3: Galaxies and the Large-Scale Structure of the Universe **[10 L]**

- The Milky Way.
- Other galaxies.
- Black holes.
- Planetary nebula.
- Brief idea about radio telescopes.

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	Bloom's Level	Remarks
M1	Solar System Overview	15	30	1, 2, 3	NA
M2	Space Life	20	40	1, 2, 3	NA
M3	Galaxies and the Large-Scale Structure of the Universe	10	30	1, 2, 3	NA
Total		**45**	**100**		

Suggested Readings:

1. A Textbook of Astronomy and Astrophysics – Mohit Kumar Sharma & Suresh Chandra
2. Astronomy – William Waller
3. An Introduction to Astrophysics – Basu (2022)
4. Space Physiology and Medicine: From Evidence to Practice – Nicogossian A.E., Springer
5. The Truth of Origin of Universe (5 Volume Set) – Dr. Sabrie Soloman (2024)

(GE1B-05): BASICS OF HUMAN GENETICS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To help understand the Cell and Cell organelles.
2. To gain knowledge about DNA structure and DNA replication.
3. To help understand DNA sequencing.
4. To help understand cloning.

Course Outcomes (CO):

Sl. No.	Course Outcome	Mapped Modules
CO1	Knowledge about cell and cell organelles.	M1
CO2	Understand cell cycle and apoptosis.	M1
CO3	Understand histoprotein, DNA structure and replication.	M2
CO4	Knowledge about genome organisation.	M2
CO5	Concept of DNA Technology & sequencing.	M3
CO6	Concept of Genetic counselling.	M4

Detailed Syllabus

Module 1: Introduction to Cell **[10 L]**

- From molecules to first cell, from prokaryotes to eukaryotes, from unicellular to multicellular organisms.
- Cell colony, cell cohesion, internal environment or homeostasis of cells.
- Plasma membrane, mitochondria, cytoskeleton.
- Golgi complex, endoplasmic reticulum, ribosomes.
- Lysosomes and related diseases, peroxisomes.
- Nucleus and nucleolus.
- Cell cycle, apoptosis, cell-cell communication.

Module 2: Basics of Genetics **[15 L]**

- Structure of DNA, histone proteins, nucleosome, solenoid structure.
- Molecular organization of DNA in chromosomes.
- Heterochromatin and euchromatin.
- Human mitochondrial DNA.
- DNA replication – nuclear and mitochondrial.
- Transcription, translation, control of gene expression – eukaryotic.
- Penetrance and expressivity, phenocopy, gene interactions and modifying genes.
- Mechanism of sex determination, sex-linked inheritance, linkage and crossing over.
- Concepts of genome organization – split genes, overlapping genes, unique sequences, repetitive sequences, pseudogenes, transposons, conserved genes.
- Population genetics.

Module 3: Concept of Molecular Biology **[15 L]**

- Enzymes used in DNA technology.
- Isolation and purification of DNA (genomic and plasmid) and RNA.
- Electrophoresis: agarose, PAGE, pulse-field electrophoresis, capillary electrophoresis, 2D electrophoresis.
- Polymerase chain reaction and its applications.
- DNA sequencing.
- ELISA.
- Blotting techniques – Southern, Northern, Western.
- Basic concepts of cloning.

Module 4: Genetic Counselling & Management **[5 L]**

- Overview of genetic counselling.
- Components of genetic counselling.
- Information gathering and construction of pedigrees and their interpretation.
- Risk assessment and counselling in common Mendelian and multifactorial syndromes.
- Management of genetic disorders.

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks
M1	Introduction to Cell	10	20	1, 2, 3	NA
M2	Basics of Genetics	15	40	1, 2, 3	NA
M3	Concept of Molecular Biology	15	30	1, 2, 3	NA
M4	Genetic Counselling & Management	5	10	1, 2, 3	NA
Total		**45**	**100**		

Suggested Readings:

1. Genetics and Its Application – Joshua Peter
2. The Basics of Genetics – Betsey Dexter Dyer
3. Fundamentals of Genetics – Dr. B.D. Singh
4. Principles of Genetics – Pranab Paul
5. Genetic Counselling – Usha Dave

(GE1B-06): MARINE SCIENCE

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To help understand the physical properties of sea waves and tides.
2. To familiarise students with the chemical composition of seawater and its elements.
3. To provide understanding of the origin of seawater.
4. To provide understanding of plankton and its characteristics.
5. To gain knowledge about the life cycle of seaweeds.

Course Outcomes (COs):

Sl. No.	Course Outcome	Mapped Modules
CO1	Explain the different kinds of tides and waves.	M1
CO2	Explain wave spectrum and wave forecasting.	M1
CO3	Understand composition of seawater and elements of seawater.	M2
CO4	Understand the concept of planktons and their classification.	M3
CO5	Explain the life cycle of seaweeds.	M3

Detailed Syllabus

Module 1: Introductory Physical Oceanography [15 L]

- Physical laws of ocean; chaos, complexity & bifurcations.
- Types of tides and tide generating forces.
- Tidal theories – equilibrium & dynamic theories.
- Types of ocean waves; wind-generated waves and their characteristics.
- Shallow and deep-water waves.
- Wave spectrum and principles of wave forecasting.
- Wave-induced near shore current, longshore current, rip current and sediment movement.
- Storm waves and sediment transport.

Module 2: Fundamentals of Chemical Oceanography [15 L]

- Constancy of composition for seawater.
- Chlorinity & the concept of salinity and methods of determination.
- Classification of elements in seawater – major, minor and trace elements: their behaviour, distribution and biological interactions.
- Physical properties of seawater; typical distribution of water characteristics in oceans.
- Major water masses of the world's oceans and their characteristics.
- Origin of seawater – composition of rain, river and seawater; sources of dissolved elements.
- Crustal rock weathering and sodium balance concept.

Module 3: Basics of Biological Oceanography [15 L]

- **Plankton**: Definition, importance, classification based on size, mode of life and habitat.
- **Marine Animals**: Classification, distribution and characteristics of zooplankton, nekton and benthos. Salient features of foraminifera, radiolaria, porifera, coelenterates, polychaeta, mollusks, crustaceans, echinoderms, protochordates and chordates of marine inhabitants.
- **Seaweeds**: Life cycles, morphological and anatomical adaptations, ecological role.
- **Mangroves**: Definition, world distribution, osmoregulation and salt balancing mechanisms, Morphological, anatomical and physiological adaptations of mangroves.

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks
M1	Introductory Physical Oceanography	15	30	1, 2	NA
M2	Fundamentals of Chemical Oceanography	15	40	1, 2, 3	NA
M3	Basics of Biological Oceanography	15	30	1, 2, 3	NA
Total		**45**	**100**		

Suggested Readings:

1. Oceanography and Marine Biology: An Introduction to Marine Science – David W. Townsend
2. Oceanography: An Invitation to Marine Science – Tom Garrison
3. Marine Biology *(11th Edition)* – Peter Castro & Michael Huber
4. Introduction to the Biology of Marine Life – John Morrissey
5. General Biology – Uma Devi Koduru

(GE1B-07): BASICS OF EVOLUTIONARY BIOLOGY

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To provide a comprehensive overview of the concept of Evolution.
2. To explain the origin of life, especially Prokaryotes as well as Eukaryotes, in detail.
3. To explore the salient features of various theories of evolution.
4. To develop knowledge regarding various sources of variations and their role in evolution.

Course Outcomes (COs)

Sl. No.	Course Outcome	Mapped Module
CO1	Understand the concept of evolution and its importance.	M1
CO2	Explain the origin of life, especially Prokaryotes as well as Eukaryotes.	M1
CO3	Describe salient features of various theories of evolution, Darwinism and Neo-Darwinism.	M2
CO4	Apply the Hardy–Weinberg Equilibrium to population genetics.	M2 / M3
CO5	Understand evidence of evolution – analogy, homology, embryology, paleontology, molecular phylogeny.	M3
CO6	Explain the origin and evolution of man.	M4
CO7	Understand various sources of variation and their role in evolution.	M4

Detailed Syllabus

Module 1: Life's Beginnings [5L]

- Concept of Evolution
- Origin of Life
- Origin of Prokaryotes and Eukaryotes

Module 2: Theories of Evolution [15L]

- Early Ideas of Evolution
- Darwin's Theory of Natural Selection
- Mutation Theory of Evolution
- Modern Synthetic Theory of Evolution
- Classic Experiment: Lederberg's Experiment
- Hardy–Weinberg Equilibrium

Module 3: Evidences of Evolution [15L]

- Analogy and Homology
- Embryological Evidences of Evolution
- Paleontological Evidences of Evolution
- Molecular Phylogeny

Module 4: Product of Evolution **[10L]**

- Micro-evolutionary Changes
- Concept of Species & Speciation
- Overview of Adaptive Radiation
- Evolution of Man

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks
M1	Life's Beginnings	05	20	1, 2	NA
M2	Theories of Evolution	15	30	1, 2, 3	NA
M3	Evidences of Evolution	15	20	1, 2, 3	NA
M4	Product of Evolution	10	30	1, 2, 3	NA
Total		**45**	**100**		

References

1. Mark Ridley, Evolution, 3rd Edition, Blackwell Publishing (2004).
2. Sabrie Soloman, The Truth of Origin of Universe (5 Volume Set), Khanna Publishing House (2024).
3. Mathur, Tomar & Singh, Evolution and Behaviour, Rastogi Publications, Meerut.
4. Mohan P. Arora, Evolutionary Biology, Himalaya Publishing House, Bombay.
5. P. S. Verma & V. K. Agarwal, Cell Biology, Genetics, Molecular Biology, Evolution and Ecology, Revised Edition, S. Chand Publications (2004).
6. Strickberger, Evolution, Prentice Hall (2002).
7. Theodore H. Eaton Jr., Evolution, 1st Edition, W. W. Norton Publications (1970).

(GE1B-08): INTRODUCTION TO INTERDISCIPLINARY HEALTH SCIENCE

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective:
The course encourages students to examine today's complex health issues from a variety of perspectives. It provides a holistic view of health for a general understanding and appreciation of concepts in and around health and life sciences.

Course Outcomes (COs):

CO No.	Course Outcome Statement
CO1	Understand the basic concept of health.
CO2	Explain the current practices and demographics of health education in India.
CO3	Illustrate effective communication strategies in the healthcare sector.
CO4	Extend the role of IT in the health care sector.
CO5	Demonstrate the application of First Aid and CPR.

Detailed Syllabus

Module 1: Concept of Health **[10L]**

- Definition of physical, mental, social, and spiritual health
- Determinants of health and indicators of health
- Concept of disease, natural history of diseases, and disease agents
- Concept of prevention of diseases
- Vaccinations in India

Module 2: Evaluation & Practice of Health Education in India **[10L]**

- Demography and family planning: Demographic cycle, fertility
- Family planning and contraceptive methods, Behavioural methods, natural family planning, chemical methods, mechanical methods, hormonal contraceptives
- Population problem of India

Module 3: Health Communication **[10L]**

- Concepts and principles of communication in healthcare
- Definition, purpose, and types of communication
- Communication process
- Directions of communication: Upward, Downward, Lateral
- Factors influencing communication
- Barriers to effective communication

Module 4: Role of IT in Health Sector **[10L]**

- Fundamentals of Management Information System (MIS)
- Introduction to Internet applications in healthcare
- Decision Support System (DSS): Definition, evolution, relationship with MIS, characteristics, classification, objectives, applications
- Database Management System (DBMS): Need for DBMS, concepts of tables, records, attributes

Module 5: Basic First Aid Techniques **[5L]**

- Aims of First Aid
- Dealing with an emergency
- Basic CPR and Resuscitation
- Recovery position
- Initial top-to-toe assessment
- Hygiene and hand washing
- First Aid overview flow chart

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	Bloom's Level	Remarks
M1	Concept of Health	10	20	1,2	NA
M2	Evaluation & Practice of Health Education in India	10	20	1,2,3	NA
M3	Health Communication	10	20	2,3	NA
M4	Role of IT in Health Sector	10	20	2,3,4	NA
M5	Basic First Aid Techniques	5	20	3,4,5	Practical relevance
Total		**45**	**100**		

Suggested References

1. Kevin B. Wright, Lisa Sparks, H. Dan O'Hair – Health Communication in the 21st Century, Blackwell Publishing Ltd, 2013.
2. R.D. Karma – Health Communication, Mohit Publications, 2008.
3. Rajinikanth A.M. – Counseling Skills for Health Care Professionals, Jaypee Brothers, 1st Edition.
4. James A.O. Brien – Management Information Systems, McGraw-Hill/Irwin.
5. Indian First Aid Manual, 7th Edition (2016), Indian Red Cross Society.

(GE2B-01): A HAND ON STUDY ON FILM

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives

The course is designed for students who are passionate about cinema and acting. Many young people in our nation are deeply in love with cinema and entertainment but often face a dilemma between passion and career. This course aims to:

- Provide an idea about how films are made.
- Teach the tricks of making a review.
- Explain the proper way of acting.
- Familiarize students with how a camera works.

Course Outcomes (CO):

CO No.	Course Outcome
CO1	Build an understanding of various aspects of film-making.
CO2	Gain knowledge about proper planning and work management in film production.
CO3	Develop skills in story development, screenplay writing, and dialogue writing.
CO4	Demonstrate acting techniques through role-playing, stage/set understanding, and workshops.
CO5	Understand the grammar of film-making, including camera shots and movements.
CO6	Critically analyze films by watching iconic works and maintaining a film diary.

Detailed Syllabus

Module 1: How to Read a Film (Fiction & Non-fiction)

- Learning meaning by watching selected documentaries and feature films.
- Basics of film criticism and review writing.

Module 2: Film Production Process

- Pre-production, production, and post-production stages.
- Planning, scheduling, and team management in filmmaking.

Module 3: Screenplay Development

- Concept formation.
- Writing a film script from a story.
- Dialogue writing and adaptation techniques.

Module 4: Acting

- Role-playing exercises.
- Understanding stage/set dynamics.
- Practical workshops for performance training.

Module 5: Camera Grammar

- Basics of camera shots and movements.
- Framing, angles, and composition.
- Technical awareness of shooting methods.

Module 6: Film Viewing & Analysis

- Watching iconic films from around the globe.
- Maintaining a film diary and writing reviews.
- Comparative study of styles across genres.

List of Experiments / Practicals

1. Watching and analyzing different genres of films from around the world.
2. Practicing different acting techniques.
3. Understanding the stage of theatre production.
4. Exploring the set of a film.
5. Studying camera movements and different types of shots.

Module Wise Marks Distribution

Module No.	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks (if any)
1	How to read a film	10	10	1, 2	–
2	Pre-production, production and post-production	5	20	1, 2, 3	–
3	How to make a screenplay	10	20	3, 4	–
4	Acting	10	10	2, 3, 4	–
5	Understanding basic shots and camera movement	5	20	1, 2, 3	–
6	Watching iconic films from around the globe and maintaining a film diary	5	20	1, 2, 3, 4	–
Total		**45**	**100**	–	–

Suggested Reading

1. James Monaco – How to Read a Film
2. Bali & Bali – Audio Video Systems
3. Michael Rabiger & Mick Hubris-Cherrier – Directing: Film Techniques and Aesthetics
4. Michael Rabiger – Directing the Documentary
5. Judith Weston – Directing Actors
6. Satyajit Ray – Our Films, Their Films

(GE2B-02): DIGITAL PHOTOGRAPHY BASICS AND BEYOND

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives

If you love cameras and producing beautiful images, and have an eye for good angles and light, consider a flexible and creative career in Photography. This course is an ever-blooming field with numerous job and business opportunities. Various media agencies and news agencies hire photographers for newspapers, magazines, websites, and news channels. Apart from that, there is a constant demand for aesthetic photographers who can capture landscapes, wildlife, portraits, and other creative themes.

Course Objectives (CO):

CO Number	Course Outcome
CO1	Understand the introduction to photography (Analogue to Digital).
CO2	Demonstrate knowledge of photographic composition.
CO3	Explain digital basics and digital platforms.
CO4	Understand the techniques of digital capture.
CO5	Apply skills in scanning and image editing.
CO6	Demonstrate digital retouching and image enhancement.
CO7	Understand and apply digital output processes.

Detailed Syllabus:

Module 1: Introduction to Photography (Analogue to Digital)

- History of photography
- Digital revolution and its impact
- Exposure triangle
- Advantages and disadvantages of digital photography over film photography
- Introduction to cameras (Analogue to Digital)
- Elements of photography

Module 2: Photographic Composition

- Principles of composition
- Rules of photographic composition
- Visual perspectives
- Basics of color in photography

Module 3: Digital Basics & Digital Platform

- Hardware and system software (Windows OS)
- Representation of digital images: resolution, pixel depth, pixel aspect ratio, dynamic color range, file size
- Color models, image compression, file formats, calculating resolution for outputs
- Raster vs. vector methods
- Image transportation through floppy, CD, zip, and Internet

Module 4: Digital Capture

- Digital image formation: image sensors and capturing methods
- Digital cameras: types (floppy disk, flash card, hard disk type)
- Overview of current digital cameras
- Use of scanners and frame grabbers

Module 5: Scanning and Image Editing

- Scanners as input devices: working and procedure
- Scanning resolution
- Image editing using Photoshop:

  i. Adjusting brightness, contrast, tonal and color values
  ii. Levels and curves

Module 6: Digital Retouching & Image Enhancement

- Image size, resolution
- Selection tools and techniques
- Retouching tools, layers, photo mounting
- Incorporating text into images
- Digital manipulation with masks, filters, and darkroom effects

Module 7: Digital Output

- Placing photos in documents
- Using photos on the web
- Printers as output devices: types of prints, proofing, and photo-quality printing
- Methods of printing digital images

Module Wise Marks Distribution:

Module	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks (if any)
1	Introduction to Photography (Analogue to Digital)	3	10	1, 2	–
2	Photographic Composition	10	25	2, 3	–
3	Digital Basics & Digital Platform	5	10	2	–
4	Digital Capture	5	10	2, 3	–
5	Scanning and Image Editing	7	10	2	–
6	Digital Retouching & Image Enhancement	10	25	1, 2, 3	–
7	Digital Output	5	10	2, 3	–
Total		**45**	**100**	–	–

Suggested Readings

1. Photography Life – Photography Basics
2. Complete Digital Photography – Tom Ang
3. Photography Masterclass – Phil Ebiner
4. The Ultimate Photography Beginner's Guide – Maverick Williams
5. Mastering Photoshop – Khanna Publishing House

(GE2B-03): CINEMA AND OTHER ARTS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective:

The course is designed to provide a general understanding and appreciation of the history of world cinema, acclaimed international films, artists, and movements. Students will gain multiple cultural perspectives based on the underlying theories and principles of cinema and media.

Course Outcomes (COs):

Sl. No.	Course Outcome
CO1	Understand the fundamental components of cinema and other arts.
CO2	Remember the readings and understand the perspective.
CO3	Understand the nuances of modern painting.
CO4	Understand the nuances of Indian painting.
CO5	Understand and examine Indian and Western music.
CO6	Analyze the music of parallel and commercial Indian cinema.

Detailed Syllabus:

Module 1: Pre-Renaissance:

- Visual representations in cave paintings, folk cultures, and early civilizations like Egypt.
- Visual representations in Greece: A breakaway from earlier practices.
- Visual representations in ancient and medieval India: Ajanta cave paintings, Mughal miniature, Kangra, Ragmala, etc.

Module 2: Renaissance and Perspective:

- The Renaissance at a glance – European Renaissance art.
- Development of the idea of perspective; use of camera obscura and camera lucida.
- Selected readings from John Berger's *Ways of Seeing*.
- Dutch painting; Baroque, Rococo, and Mannerism.

Module 3: Modern Painting:

- Impressionism, Expressionism, Surrealism, Cubism.

Module4: Indian Painting:

- Raja Ravi Verma, Bengal School, Contemporary Masters.

Module 5: Fundamentals of Music:

- Tone, note, key, octave, musical scales (diatonic and tempered scales), chords, melody, harmony, swar and shruti.

- Folk music, forms and structures of Indian classical music and Western classical music.
- Evolution of musical forms; music industry and popular music; urban folk music, Blues, Jazz, Rock.

Module 6: Music and Cinema:

- Music for cinema: comparison of music and cinema; Ray and Ghatak's ideas on structural similarities.
- Analysis of film structures in comparison with musical forms.
- Musical accompaniment of films – from live accompaniment of silent era to present day.
- Diegetic and extra-diegetic music; analysis of music tracks of selected films.
- Electronic vs. acoustic musical accompaniment (workshop by a music composer).
- Item numbers of Bollywood films.

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	Bloom's Level	Remarks (if any)
M1	Pre-Renaissance	8	15	L1, L2	
M2	Renaissance and Perspective	8	15	L1, L2	
M3	Modern Painting	6	15	L1, L2	Workshop
M4	Indian Painting	6	15	L1, L2	Workshop
M5	Fundamentals of Music	8	15	L2, L3	Workshop
M6	Music and Cinema	9	25	L2, L3	Workshop
Total		**45**	**100**		

Suggested Readings:

1. Andrei Tarkovsky, Sculpting in Time
2. Satyajit Ray, Our Films Their Films
3. Ritwik Ghatak, Rows and Rows of Fences
4. Penguin Dictionary of Music
5. S.C. Deva, Music of India
6. E.H. Gombrich, The Story of Art, Phaidon Publications
7. Hendrik Willem Van Loon, The Arts of Mankind
8. Hugh Honour and John F. Fleming, The Visual Arts: A History, Prentice Hall, 2005
9. Sylvan Barnet, A Short Guide to Writing About Art, Prentice Hall, 2007
10. The Enquiring Eye – European Renaissance Art (National Gallery of Art, Washington)
11. Herbert Read, The Meaning of Art
12. Walter Pater, The Renaissance
13. John Berger, Ways of Seeing
14. Helen Gardner, Art Through the Ages
15. Wendy Beckett, The Story of Painting
16. Vernon Hyde Minor, Art History's History
17. Stephen Little, Isms: Understanding Art
18. Hugh Honour, The Visual Arts: A History
19. Will Gompertz, What Are You Looking At: 150 Years of Modern Art in a Nutshell
20. E.H. Gombrich, Art and Illusion: A Study in the Psychology of Pictorial Representation

(GE2B-04): VISUAL DESIGN AESTHETICS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective:

- To familiarize students with the basic principles and fundamentals of visual art and design.
- To develop foundational skills using tools and theories applied in the design process.
- To understand the creative process and cultivate techniques and methods for creative problem-solving.

Course Outcomes (CO):

Sl. No.	CourseOutcome(CO)
CO1	TobeabletorelateandexplaintheHistoryofgraphicdesignandunderstandingofaroleof graphic designer
CO2	Todemonstrategraphicdesignhelptothinktohowtocratemovieposter
CO3	Understandofcolourasperthetoneoffilmandchoosingappropriatecolour
CO4	Evaluateconceptsandapplytypographytodofilmtitlingandcreateposter

Detailed Syllabus:

Module 1: **[10L]**

- Role of a graphic designer
- Qualities of a graphic designer
- Creativity, Consistency, Problem solving, always learning, able to take criticism, Patience

Module 2: **[15L]**

- The distinction between art and design.
- Introduction of fundamental elements and principles of visual design and it's application.
- Geometrical and organic shapes, Texture, value, tone, negative space etc.
- The principles of good design: balance, movement, repetition, emphasis, simplicity, contrast, proportion, space, and unity.
- The Elements of Design and the language of the visual arts
- The 7 elements of design consider space, line, form, light, color, texture and pattern.
- Understanding the application and practice of elements of design and principal of design in graphic design.

Module 3: **[10L]**

- Role of colour in design. Colour theory. Colour psychology. Colour strategy.
- Understanding the color cycle and their uses.
- What is color circle in art?
- What do you mean by Colour circle?
- There are three different types of colors: primary, secondary, and tertiary colors.
- How color creates mood for film.

Module 4: **[10L]**

- Typography and Logo.
- The role of typography in design. Typeface anatomy, classification of typography – serif, san serif, script, decorative.
- Definition and practice of Sanserif and serif font.
- Difference of Sanserif and serif font.
- How to choose font.

Module Wise Marks Distribution:

CO	Blooms Level (if applicable)	Modules	% of questions
CO1	1,2	M1,M2,M3	30
CO2	1,2	M1,M2	20
CO3	2,3	M2,M3,M4	30
CO4	2,3	M3,M4	20
Total			**100**

Suggested Readings:

1. Thinking with Type by Ellen Lupton
2. Logo Modernism by Jens Muller and R. Roger Remington
3. Graphic Design School: A Foundation Course for Graphic… by David Dabner and Sandra Stewart

(GE2B-05): STUDY OF PERFORMING ARTS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective:

- To provide students with a foundational understanding of the performing arts as an applied discipline.
- To offer hands-on training and experiential learning in dance, music, and acting.
- To nurture artistic expression, creativity, and aesthetic appreciation through practical engagement.
- To familiarize students with the essence of *Arts and Aesthetics* in a simplified, practice-oriented manner.

Course Outcomes (CO):

Sl. No.	Course Outcome	Mapped Module
1	Building up a complete idea about various forms of performing arts.	M1
2	Generating an idea about the history of the practice of the three forms of art in our nation and worldwide.	M2
3	Gaining knowledge about vocal and instrumental music practice and forms in India and worldwide.	M3
4	Gathering knowledge about different forms of dance in India and worldwide.	M4
5	Developing an idea about theatre practice in the nation and in other countries worldwide.	M5
6	Hands-on training in all types of performing arts.	M6

Detailed Syllabus:

Module 1: Introduction to Performing Arts

- What is the meaning of performing arts?

Module 2: Origins of Performing Arts

- Idea about the origins of the practice of different medium of performing arts:
  i. Dance
  ii. Music
  iii. Theatre

Module 3: Intense Study of Music

- Indian and Western music
- Different genres of Indian music
- Different genres of Western music
- Icons of Music:

  i. International: Beethoven, Bach, Mozart, Ravi Shankar, Elvis Presley, The Beatles, John Denver, Michael Jackson, Pink Floyd

ii. Indian: Pandit Yashraj, Amzad Ali Khan, A.R. Rahman, R.D. Burman, Sachindev Burman, Begum Akhtar

Module 4 (M4): Intense Study of Dance

- Indian and Western forms of dance
- Icons in the field of dancing:

  i. International: Anna Pavlova, Michael Jackson, Fred Astaire, Martha Graham, Patrick Swayze, Carmen Amaya, Willi Ninja

  ii. Indian: Uday Shankar, Rukmini Devi Arundale, Pandit Birju Maharaj, Kelucharan Mahapatra, Guru Vipin Singh, Shovna Narayan, Sonal Mansingh, Balasaraswati, Mrinalini Sarabhai

Module 5 (M5): Intense Study of Theatre

- Different types of theatre
- Iconic figures in Indian theatre: Badal Sarkar, Rudraprasad Sengupta, Utpal Dutta, Ratan Thiyam, Girish Karnad, Nasiruddin Shah, Shabana Azmi, Kaushik Sen, Bratya Basu
- Iconic figures in theatre worldwide: Lee Strasberg, Constantine Stanislavski, Laurence Olivier, Bertolt Brecht, Shakespeare, Ibsen

Module 6 (M6): Practical Performance

- One project on Music
- One project on Dance
- One project on Theatre

(All of these projects will be based on practical performance of different small groups.)

List of Experiments:

1. Intense practice of different genres of music
2. Intense practice of different genres of dance
3. Acting workshops

Module Wise Marks Distribution:

Module No.	Context	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks (if any)
1	Introduction to performing arts.	5	10	1, 2	
2	Idea about the origins of the practice of different medium of performing arts.	10	10	1, 2	
3	Intense study of Music	5	20	2, 3, 4	
4	Intense study of Dance	10	20	2, 3, 4	
5	Intense study of Theatre	10	20	2, 3, 4	

Suggested Readings

1. Indian Performing Arts – Utpal K. Banerjee
2. Universal Dance and Drama – P. Medini Hombal, Luminous Books, Varanasi
3. Sangeet Natak Academy Journal – Sangeet Natak Academy, New Delhi
4. Dance Theatre of India: Crossing New Aesthetics and Culture – Neyogi Books
5. The Viewpoints Book: A Practical Guide to Viewpoints and Composition – Anne Bogart and Tina Landau
6. The Empty Space – Peter Brook
7. History of the Theatre (10th Edition) – Oscar G. Brockett and Franklin J. Hildy
8. An Actor Prepares – Konstantin Stanislavski
9. Changed for Good: A Feminist History of the Broadway Musical – Stacy Wolf
10. The Cambridge Companion to African-American Theatre – Harvey Young (ed.)

(GE2B-06): THE LANGUAGE OF GRAPHIC DESIGN: BASICS AND BEYOND

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

- To familiarize students with the expanding scope of Graphic Design and the opportunities created by advances in communication technology.
- To develop analytical skills and critical judgment, enabling students to engage in technological and/or aesthetic innovations in the field of Communication Design.
- To introduce students to design history, theory, and traditional design skills as a foundation for understanding current graphic design practices and technologies.
- To prepare graduates for a wide range of careers in the design industry by equipping them with strong aesthetic and analytical skills.
- To enable students to solve real-world communication design problems by integrating a command of visual language with imagination, theory, and technology.

Course Outcomes (CO):

Sl. No.	Course Outcome	Mapped Module
1	Understanding Introduction to Multimedia	M1
2	Understanding Study of Multimedia Computer	M1, M2
3	Understanding Study of Operating System	M2, M3
4	Understanding Basics of Internet	M4
5	Understand Text Component in Multimedia	M5
6	Understanding Image & Graphics component in Multimedia	M6
7	Understanding Animation	M6, M7

Detailed Syllabus:

Module 1: Introduction to Multimedia

- What is Multimedia
- Components of Multimedia
- Multimedia product ideas
- Product formats
- Multimedia content
- Multimedia Applications
- Advantages of Multimedia

Module 2: Study of Multimedia Computer

- Multimedia Platform & Accessories
- Hardware and system software
- Different configurations of Multimedia Personal Computer

Module 3: Study of Operating System

- Introduction to Windows OS: Different features
- Functions and use
- Management of files and folders

Module 4: Basics of Internet

- Internet and its different features
- Hardware and software used for Internet and their purposes
- Concept of E-mail
- Surfing the Website

Module 5: Text Component in Multimedia

- Importance of text in Multimedia
- Free Text – Field Text – Considerations for designing Text
- Text Formats – Font and Point Sizes
- Character Formats – Scrolling Text
- Special Effects for Text
- Text File Formats
- Hypertext
- Importing & Exporting of documents

Module 6: Image & Graphics Component in Multimedia

- Introduction to Image & Graphics – Types of Graphics – Making still images in multimedia applications
- Digital Image: Methods of storing & processing (Raster, Vector) – Factors influencing quality (Resolution, Pixel depth, Pixel aspect ratio) – Colour models
- Methods of Capturing: Scanner, Digital Camera, Frame Grabber
- Image Compression: Lossy & Non-lossy – Image file formats
- Concept of Digital Darkroom: Working with image editing software like Adobe Photoshop – Acquiring, Importing & Exporting of images – Reduction & Enlargement of Images

Module 7: Animation

- Animation & Special Effects
- Animation Techniques: Traditional and Computer-based Animation
- Image Manipulation Techniques: Tweening, Warping, Morphing
- Two-Dimensional Animation – Concept of 2D animation software (Macromedia Flash etc.)
- Three-Dimensional Animation – Concept of 3D Animation software (3D Studio Max etc.)

List of Experiments

1. Windows: Functions & Use
2. File Handling
3. Understanding different features of Internet
4. Experimentation of different typographic features
5. Experiment with Visual balance & Colors
6. Experiment with various Animation Techniques
7. Understanding 2D and 3D Animation
8. Understanding User Interface of different Multimedia Software

Module Wise Marks Distribution:

Module	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks (if any)
1	Introduction to Multimedia	3	10	1, 2	–
2	Study of Multimedia Computer	5	25	1, 2, 3	–
3	Study of Operating System	5	10	2	–
4	Basics of Internet	7	10	2, 3	–
5	Text Component in Multimedia	5	10	2, 3	–
6	Image & Graphics component in Multimedia	10	15	1, 2	–
7	Animation	10	20	1, 2, 3	–
Total		**45**	**100**	–	–

Suggested Readings

1. Multimedia & Animation – V.K. Jain, Khanna Publishing House
2. Graphic Design: The New Basics (Second Edition) – Ellen Lupton
3. Universal Principles of Design (Revised and Updated): 125 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions, and Teach through Design – William Lidwell
4. The Animator's Survival Kit – Richard E. Williams

(GE3B-01): IT LITERACY

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

- Impart a foundational-level appreciation for the implementation of IT in business and management.
- Enable students to utilize digital tools for communication.
- Develop the ability to research and interpret digital information.
- Provide training in advanced spreadsheet development.
- Familiarize students with operating systems and word processing functions.
- Support the evaluation, selection, and application of office productivity software.
- Apply IT knowledge specifically in a sports management context.

Course Outcomes (CO):

Sl. No.	Course Outcome	Mapped Modules
1	Identify the principal components of a relevant computer system and describe computer technology for communication in management.	M1, M3
2	Interpret fundamental hardware components that make up a computer's hardware and the role of each of these components relevant to management.	M1, M2
3	Relate the usage of digital innovations in sports, threats and opportunities of digital application in sports, and perform SWOT analysis.	M2, M4
4	Explain the role of information technology in presentations supporting the functions of large sport events and their stakeholders, as well as the needs of sports federations.	M1, M2, M3
5	Understand the emerging technological trends, as well as solutions and applications that will impact broadcasting, media industries, and spectators' experience.	M1, M4, M5, M6
6	Demonstrate developing technology solutions and understand the limits of data capture (what, how, and why) in sport.	M4, M6

DetailedSyllabus:

Module 1: Data and Information Storage & Operating Systems [10]

- **Data and Information** – Definition and meaning.
- **Data Storage Devices**:

  i. Primary Storage*:* RAM, ROM, EEPROM, PROM, EPROM.
  ii. Secondary Storage*:* Direct access devices, serial access devices – hard disks, CD-ROM, DVD.

- **Central Processing Unit (CPU)** – Control Unit.
- **Computer Languages** – Machine language, assembly language, and high-level language, Role of assembler and compiler.
- **Storage Devices** – Floppy disk, hard disk, CD-ROM, and DVD.
- **Importance of Computer as Data Storage** – Application in Business and Management.
- **Fundamental Hardware Applications in Sports Management** – RFID chips, sensors, timing systems, and their applications in sports management.

Operating System and Application Software

- **Meaning of Software** – Broad classification of software.
- **System Software and Application Software** – Utilities.
- **Operating Systems** – Brief introduction to DOS, Windows, Unix, Linux etc.
- **Emerging Technologies** – Importance and application of Cloud, Mobile, Artificial Intelligence in Sports Management.

Module 2: Digital Transformations and Innovations [6L]

- **Digital Transformation and Future Changes** – Emerging trends and challenges in management.
- **Factors of Success** – Key drivers for effective digital transformation.
- **Impact of Digital Media on Business** – Opportunities and risks.
- **New Digitized Innovations in Modern Management** – Applications and relevance.
- **Impact of Digital Media** – SWOT analysis.
- **Role of Databases** – Roles, types, functions, current practices, and future potentials.
- **Importance of Digital Technology in Management** – Applications in decision-making and efficiency.

Module 3: Presentation, Word Processing, and Spreadsheet Software [10L]

- **Presentation Software (PowerPoint)**

i. Creating new presentations – AutoContent Wizard, using templates, blank presentation.
ii. Opening existing presentations.
iii. Adding, editing, deleting, copying, hiding slides.
iv. Applying new design, adding graphics, using headers and footers.
v. Animating text and adding special effects for transition slides.
vi. Controlling transition speed and adding sounds to slides.
vii. Using action buttons.

- **Word Processing Software (MS Word)**

i. Creating a new document with templates and Wizard, creating own document.
ii. Opening and modifying a saved document, converting files to and from other document formats.
iii. Using keyboard shortcuts and mouse functions.
iv. Adding symbols and pictures, using headers and footers.
v. Finding and replacing text, spell check and grammar check.
vi. Formatting text: paragraph formats, adjusting margins, line spacing, character spacing.
vii. Changing font type and size.
viii. Using bullets and numbering.
ix. Working with tables: adding, editing, deleting tables, modifying rows and columns, merging and splitting cells.

- **Spreadsheet Software (MS Excel)**

i. Working with worksheets and cells: entering, editing, moving, copying, cutting, pasting, transforming data.
ii. Inserting and deleting cells, rows, and columns.
iii. Working with multiple worksheets: switching, moving, copying, inserting, deleting worksheets.
iv. Using formulas for quick calculations, working with and entering formulas.
v. Formatting worksheets.
vi. Creating and editing charts: chart elements, selecting data, types of charts, using Chart Wizard.
vii. Formatting chart elements, editing a chart, and printing charts.

Module 4: Management Information Systems (MIS) & ERP **[6L]**

- **Management Information Systems (MIS):**

  i. Database management.
  ii. Data communications.
  iii. Transaction processing information systems.
  iv. Decision support systems.
  v. Information reporting systems.
  vi. Office automation.
  vii. Networks.
  viii. Expert systems.
  ix. Systems analysis and design.

- **Enterprise Resource Planning (ERP):**

  i. Introduction and need for ERP.
  ii. Advantages of ERP.
  iii. Major ERP packages.
  iv. Applications of ERP.

Module 5: Operating Systems in Management Applications **[6L]**

- **DOS System** – Commands and editors (Preliminaries) used in Sports Management.
- **UNIX System** – Commands and *vi* editor (Preliminaries), applications in Management.
- **Programming Concepts:**

  i. Programs to demonstrate control structures (text processing, use of *break* and *continue*).
  ii. Programs involving functions and recursion.
  iii. Use and application of programming in Business and Management.

Module 6: Programming Applications and Office Tools **[7L]**

- **Programming Applications:**

  i. Programs involving the use of arrays with subscripts and pointers.
  ii. Programs using structures and files.
  iii. Applications of C Language.

- **Microsoft Office Applications:**

  i. Word.
  ii. Excel.
  iii. PowerPoint.
- **Internet – Use and Applications.**
  i. Mail Merge.

Module Wise Marks Distribution:

Module	Content	Total Hours	% of Questions	Bloom's Level	Remarks (If any)
M1	Data and Information Storage	10	20%	1, 2	
M2	Digital Transformation and Innovation in Sports Management	06	15%	1, 2	
M3	Presentation Software	10	15%	1, 2	
M4	Management Information System	06	15%	1, 2	
M5	DOS System Commands and Editors	06	15%	2, 3	
M6	Programs involving the use of arrays with subscripts and pointers	07	20%	2, 3	
	Total	**45**	**100%**		

Suggested Readings:

1. Mano – Computer System Architecture; Pearson Education
2. Tanenbaum – Structured Computer Organization; Pearson Education
3. Martin & Powell – Information Systems: A Management Perspective; McGraw-Hill
4. Laudon & Laudon – Management Information Systems; Pearson Education
5. Comer – Computer Networks and the Internet; Pearson Education
6. Graham Curtis – Business Information Systems; Addison Wesley
7. Leon – Introduction to Computers with MS-Office; TMH
8. C.J. Date – An Introduction to Database Systems; Pearson Education
9. Jane Calabria and Dorothy Burke – Windows 98: 6 in One; PHI
10. Ed Bott – Using Microsoft Office 2000; PHI
11. Murthy, C.S.V. – Enterprise Resource Planning (ERP): Text and Case Studies; HPH
12. George Anderson & Danielle Larocca – Teach Yourself SAP in 24 Hours; Pearson Education
13. Van Wolverton – Running MS-DOS, 20th Anniversary Edition
14. Brian W. Kernighan – C Programming Language; Prentice Hall Software
15. Yashavant Kanetkar – Let Us C
16. Yashavant Kanetkar – Data Structure Through C
17. Deepali Srivastava and S.K. Srivastava – C in Depth
18. R.B. Patel – Expert Data Structures with C
19. Venkatesh, Nagaraju Y. – Practical C: Programming for Problem Solving
20. Computers Today; Khanna Publishing House

(GE3B-02): BASIC MATHEMATICS AND STATISTICS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To apply the concepts of number systems and basic algebra in solving simple business and management problems.
2. To understand and use set theory, determinants, and matrices for decision-making and problem-solving in business applications.
3. To develop the ability to evaluate limits, continuity, differentiation, and integration in solving mathematical and applied business problems.
4. To analyze data frequency and distribution for interpretation in statistical and business contexts.
5. To calculate and interpret measures of central tendency (mean, median, mode) for business data analysis.
6. To calculate and analyze measures of dispersion (range, variance, standard deviation) to understand data variability in business decision-making.
7. To integrate mathematical and statistical tools to formulate, analyze, and solve business and statistical problems effectively.

Course Outcomes (CO):

Sl	Course Outcome	Mapped Modules
1	Remembering fundamental concepts in mathematics and statistics	M1, M2, M3, M4, M5, M6,M7
2	Understanding the course content and its applications in business/statistics	M1, M2, M3, M4, M5, M6, M7
3	Applying mathematical and statistical techniques to solve general problems	M1, M2, M3, M4, M5, M6, M7
4	Analyzing problems using appropriate mathematical/statistical tools	M1, M2, M3, M4, M5, M6, M7
5	Evaluating problems after detailed analysis to derive logical conclusions	M1, M2, M3, M4, M5, M6, M7
6	Creating solutions and strategies using the evaluation process	M1, M2, M3, M4, M5, M6, M7

Detailed Syllabus:

Module 1: The Number System & Basic Algebra [6L]

- **The Number System**: Positive and negative integers, fractions, rational and irrational numbers, real numbers.
- **Applications**: Problems involving the concept of real numbers.
- **Basic Algebra**: Algebraic identities, simple factorizations.
- **Equations**: Linear and quadratic (in single variable and simultaneous equations).
- **Surds and Indices**.
- **Logarithms**: Properties (including change of base), problems based on logarithms.

Module 2: Set Theory, Permutations & Combinations **[7L]**

- **Set Theory**: Introduction; representation of sets; subsets and supersets; universal and null sets; basic operations on sets; laws of set algebra; cardinal number of a set; Venn diagrams; applications of set theory to problem-solving.
- **Permutations & Combinations**:

  i. Fundamental principle of counting, factorial notation.
  ii. Permutations: n different things, things not all different, restricted permutations, circular permutations.
  iii. Combinations: different formulas, complementary combination, restricted combination, division into groups.
  iv. **Mixed problems** on permutation and combination.

Module 3: Determinants & Matrices **[6L]**

- **Determinants**: Determinants of order 2 and 3, minors and cofactors, expansion of determinants, properties of determinants.
- **Cramer's Rule**: Solving simultaneous equations in two or three variables.
- **Matrices**: Types of matrices, matrix algebra (addition, subtraction, multiplication), singular and non-singular matrices, adjoint and inverse, elementary row/column operations.
- **Applications**: Solving systems of linear equations using matrix algebra.
- **Eigen Concepts**: Eigenvalue, Eigenvector.

Module 4: Differentiation & Integration **[4L]**

- **Differentiation**: Meaning & geometrical interpretation, standard derivatives (excluding trigonometric functions), rules of differentiation, logarithmic differentiation.
- **Integration**: Meaning, standard formulas, substitution, integration by parts (excluding trigonometric functions).

Module 5: Data Collection & Frequency Distribution **[10L]**

1. **Data Collection, Editing & Presentation**:

   i. Primary & secondary data, methods of collection, scrutiny of data.
   ii. Presentation: textual & tabular, construction & components of a table.
   iii. Diagrammatic presentation: line diagrams, bar diagrams, pie charts, divided-bar diagrams.

2. **Frequency Distributions**:

   i. Attribute & variable; discrete & continuous variables.
   ii. Frequency distribution of discrete and continuous variables, bivariate and multivariate frequency distributions.
   iii. Graphical representation:

      a. Attribute: case representation.
      b. Discrete variable: column diagram, frequency polygon, step diagram.
      c. Continuous variable: histogram, ogive.

Module 6: Measures of Central Tendency **[5L]**

- Definition & utility, characteristics of a good average.
- Arithmetic Mean, Median, Mode.
- Positional measures: quartiles, deciles, percentiles.
- Relationship between Mean, Median & Mode.
- Geometric Mean, Harmonic Mean.
- Choice of suitable measure of central tendency.

Module 7: Measures of Dispersion **[7L]**

- Meaning & objectives of dispersion, characteristics of a good measure.
- Range, Quartile Deviation, Mean Deviation, Mean Absolute Deviation, Standard Deviation.
- Measures of relative dispersion – Coefficient of Variation.
- Combined Mean & Standard Deviation.
- **Advanced Concepts**: Introduction to Skewness, Kurtosis, Moments.

Suggested Readings

1. H.S. Hall & S.R. Knight – Higher Algebra*;* Radha Publishing House.
2. Reena Garg – Engineering Mathematics; Khanna Publishing House.
3. Reena Garg – Advanced Engineering Mathematics; Khanna Publishing House.
4. Sancheti & Kapoor – Business Mathematics*;* Sultan Chand & Company.
5. R.S. Soni – Business Mathematics; Pitambar Publishing House.
6. N.G. Das – Statistical Methods (Combined Edition Vol. 1 & 2)*;* McGraw Hill Education.
7. J.K. Sharma **–** Business Statistics (5th Edition); Vikas Publishing House.
8. Manish Sharma & Amit Gupta – The Practice of Business Statistics*;* Khanna Publishing House.

(GE3B-02): BUSINESS RESEARCH METHODS TOOLS & TECHNIQUES

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To understand the basic concept, meaning, and types of research**,** along with its applications in various domains of business.
2. To learn how to formulate research problems and hypotheses, understand different types of hypotheses, and prepare a research proposal while identifying the overall research process from inception to report writing.
3. To develop an in-depth understanding of research design as the blueprint of the research process, exploring various types of research designs and their implications.
4. To understand the concept and types of data used in research and to learn about different data collection processes.
5. To become familiar with scaling techniques, including the ability to distinguish between categorical and continuous measures.
6. To understand questionnaire designing, including types of questions, advantages, disadvantages, and applications of the instrument.
7. To gain knowledge about population, sampling, sampling frame, sampling design, and determination of sample size, as well as to differentiate between sampling and non-sampling errors.
8. To learn how to formulate research hypotheses and conduct appropriate statistical tests of hypotheses, selecting the right test to answer a research question.
9. To develop skills for writing a research report, understanding its types, structure, and guidelines for effective visual representation.
10. To gain awareness of ethical issues in research**,** including ethical concerns in both quantitative and qualitative research.

Course Outcomes (CO):

Sl. No.	Course Outcome	Mapped Modules
1	Apply research & development to solve managerial problems.	Module 1
2	Formulate research problems and hypotheses, and prepare a research proposal.	Module 2
3	Demonstrate understanding of research design and its implications.	Module 3
4	Classify types of data and apply appropriate data collection methods.	Module 4
5	Distinguish between different scaling techniques and their applications.	Module 5
6	Design effective questionnaires with appropriate question types and structure.	Module 6
7	Apply sampling techniques and determine suitable sample size.	Module 7
8	Conduct hypothesis testing using appropriate statistical tools.	Module 8
9	Prepare structured research reports with proper visual representation.	Module 9
10	Analyze and apply ethical considerations in conducting research.	Module 10

Detailes Syllabus:

Module 1:

- **Unit 1**: Introduction to Research – Meaning of research; Types of research (Exploratory, Conclusive); Process of research; Research applications in social and business sciences; Features of a good research study. [4L]
- **Unit 2**: Research Problem & Formulation of Hypotheses – Defining research problem; Management Decision Problem vs Management Research Problem; Problem identification process; Components of research problem; Formulating hypotheses; Types of hypotheses; Writing a research proposal – contents and types. [6L]
- **Unit 3**: Research Design – Meaning; Nature and classification; Exploratory research (Secondary resource analysis, Case study, Expert survey, Focus groups); Descriptive research (Cross-sectional, Longitudinal); Experimental designs; Errors affecting research design. [8L]
- **Unit 4**: Data – Classification of data; Secondary data (uses, advantages, disadvantages, sources); Primary data (Observation, Focus Groups, Interviews). [4L]
- **Unit 5**: Attitude Measurement & Scaling – Types of measurement scales; Attitude scales; Classification (Single vs Multiple, Comparative vs Non-comparative); Measurement error; Criteria for good measurement. [4L]

Module 2:

- **Unit 6**: Questionnaire Design – Types, process of designing, advantages and disadvantages. [6L]
- **Unit 7**: Sampling – Concepts (Sample vs Census); Sampling vs Non-sampling error; Probability and Non-probability sampling design; Determination of sample size (for mean and proportion). [5L]
- **Unit 8**: Hypothesis Testing – Steps in hypothesis testing; Test statistics; Tests for single population mean and proportion; Tests for difference between two means and proportions. [5L]
- **Unit 9**: Research Report Writing – Types of reports (Brief, Detailed); Structure (Preliminary section, Main report, Interpretation & Recommendations); Guidelines for tabular and visual presentation. [5L]
- **Unit 10**: Ethics in Research – Meaning; Ethical codes for clients, researchers, respondents; Responsibilities of ethics in research. [4L]

Suggested Readings

1. Donald R. Cooper & Pamela S. Schindler – Business Research Methods, Tata McGraw-Hill.
2. Alan Bryman & Emma Bell – Business Research Methods, Oxford University Press.
3. C. R. Kothari – Research Methodology: Methods and Techniques, New Age International Publishers.
4. Ranjit Kumar – Research Methodology: A Step-by-Step Guide for Beginners, Sage Publications

(GE3B-04): MATHEMATICS FOR COMPUTING

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. Develop formal reasoning abilities among students.
2. Create the habit of raising and exploring questions logically.
3. Provide knowledge regarding the application of Mathematics in Computer Science.
4. Build the ability to communicate knowledge, capabilities, and skills related to the computer engineering profession.

Course Outcomes (COs):

CO1: Understand and solve mathematical problems effectively.
CO2: Apply the knowledge of relevant mathematical topics in problem-solving.
CO3: Demonstrate familiarity with linear algebra, differential and integral calculus, numerical methods, and statistics.

Detailed Syllabus:

Chapter 1: Modern Algebra **[3L]**

Set, Relation, Mapping, Binary Operation, Addition, Multiplication, semigroup, properties of groups, subgroup.

Chapter 2: Trigonometry **[4L]**

Radian or circular Measure, Trigonometric Functions, Trigonometric ratios of angle θ when θ is acute, trigonometric ratios of standard angles, allied angles, compound angles, multiple and sub-multiple angles.

Chapter 3: Limits and Continuity **[4L]**

The real number system, Concept of limit, Concept of continuity.

Chapter 4: Differentiation **[5L]**

Differentiation of powers of x, ex, log x; trigonometric functions; rules for finding derivatives; types of differentiation; logarithmic differentiation; substitution; implicit functions; parametric equations; differentiation from first principles.

Chapter 5: Integration **[4L]**

Integration of standard functions, Rules of integration, More formulas in integration, Definite integrals.

Chapter 6: Differential Equations **[4L]**

First order differential equations, Practical approach, First order & degree, Homogeneous equations, Linear equations, Bernoulli's equation, Exact differential equations.

Chapter 7: Complex Numbers **[4L]**

Complex numbers, Conjugate, Modulus, Geometrical representation, De Moivre's theorem, nth roots of complex numbers.

Chapter 8: Matrices and Determinants **[5L]**

Definition, Operations, Square matrix & inverse, Determinants & properties, Solution of equations using matrices & determinants.

Chapter 9: Infinite Series **[4L]**

Convergence and divergence, Series of positive terms, Binomial series, Exponential series, Logarithmic series.

Chapter 10: Probability **[5L]**

Concept, Sample space & events, Three approaches, Kolmogorov's axioms, Conditional probability & independence, Bayes' theorem.

Chapter 11: Introduction to Statistics **[3L]**

Measures of central tendency, Standard deviation (discrete & continuous series, deviation from assumed mean), Combined standard deviation, Coefficient of variation, Variance.

Chapter Wise Marks Distribution:

Sl. No.	Module / Chapter	% Weightage of Questions
01	Modern Algebra	7%
02	Trigonometry	5%
03	Limits and Continuity	5%
04	Differentiation	7%
05	Integration	7%
06	Differential Equations	6%
07	Complex Numbers	5%
08	Matrices and Determinants	8%
09	Infinite Series	7%
10	Probability	5%
11	Introduction to Statistics	8%

Text Books

1. S.K. Mapa – Higher Algebra, Levant Books.
2. O'Regan, Gerard – Mathematics in Computing.
3. Chakravorty and Ghosh – Advanced Higher Algebra, U.N. Dhar Pvt. Ltd.
4. Reena Garg – Advanced Engineering Mathematics, Khanna Publishing House.

Reference Books

1. Das and Mukherjee – Integral Calculus, U.N. Dhar Pvt. Ltd.
2. Das and Mukherjee – Differential Calculus, U.N. Dhar Pvt. Ltd.
3. Reena Garg – Engineering Mathematics, Khanna Publishing House.

(GE3B-05): MATHEMATICS FOR COMPUTING

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To equip students with standard mathematical concepts and tools at an intermediate to advanced level for solving problems in the discipline.
2. To familiarize students with essential statistical techniques and their applications.

Course Objectives (COs):

- **CO1:** To provide understanding of the concepts of probability, random variables, and various discrete and continuous probability distributions along with their properties.
- **CO2:** To introduce the basic ideas of statistics, including measures of central tendency, correlation, and regression.
- **CO3:** To develop knowledge of statistical methods for studying and analyzing data samples.

Detailed Syllabus:

Module I: Partial Differential Equations (PDEs) [15L]

- Definition of Partial Differential Equations.
- First-order partial differential equations, solutions of first-order linear PDEs.
- Solutions to homogeneous and non-homogeneous linear PDEs of second order using complementary function and particular integral methods.
- Classification of second-order linear equations, initial and boundary conditions.
- D'Alembert's solution of the wave equation.
- Duhamel's principle for one-dimensional wave equation.
- Heat diffusion and vibration problems.
- Separation of variables method to simple problems in Cartesian coordinates.
- The Laplacian in plane, cylindrical, and spherical polar coordinates.
- Solutions with Bessel functions and Legendre functions.
- One-dimensional diffusion equation and its solution by separation of variables.

Module II: Probability Theory [15L]

- Probability spaces, conditional probability, independence.
- Discrete random variables; independent random variables.
- The multinomial distribution, Poisson approximation to the binomial distribution.
- Infinite sequences of Bernoulli trials, sums of independent random variables.
- Expectation of discrete random variables, moments, variance of a sum.
- Correlation coefficient, Chebyshev's Inequality.
- Continuous random variables and their properties.
- Distribution functions and densities: normal, exponential, and gamma densities.
- Bivariate distributions and their properties.
- Distribution of sums and quotients, conditional densities.
- Bayes' rule.

Module III: Statistics **[15L]**

- Basic Statistics.
- Measures of Central Tendency.
- Moments, skewness, and kurtosis.
- Probability distributions: Binomial, Poisson, and Normal.
- Evaluation of statistical parameters for Binomial, Poisson, and Normal distributions.
- Correlation and regression – Rank correlation.
- Curve fitting by the method of least squares: fitting of straight lines, second-degree parabolas, and more general curves.
- Test of significance:

i. Large sample test for single proportion and difference of proportions.
ii. Tests for single mean, difference of means, and difference of standard deviations.
iii. Test for ratio of variances.
iv. Chi-square test for goodness of fit and independence of attributes.

Module Wise Marks Distribution:

Sl. No.	Module / Chapter	Marks
01	Partial Differential Equations (PDEs)	20
02	Probability Theory	25
03	Statistics	25

Text Books:

1. Erwin Kreyszig – Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons.
2. Reena Garg – Advanced Engineering Mathematics, Revised Edition, Khanna Publishing House.
3. Manish Sharma & Amit Gupta – The Practice of Business Statistics, First Edition, Khanna Publishing House.
4. N.G. Das – Statistical Methods, Tata McGraw Hill

Reference Books:

1. P.G. Hoel, S.C. Port and C.J. Stone – Introduction to Probability Theory, Universal Book Stall.
2. W. Feller – An Introduction to Probability Theory and Its Applications, 3rd Edition, Wiley.

(GE3B-06): BIOSTATISTICS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective:

- Develop an understanding of fundamental statistical concepts, probability, and data analysis techniques.
- Enable students to apply statistical tools in organizing, interpreting, and presenting health-related and research data.
- Familiarize students with statistical methods for hypothesis testing, correlation, regression, and health information systems.

Course Outcomes (CO):

CO1: Demonstrate knowledge of statistical data, frequency distribution, and graphical representation methods.

CO2: Apply measures of central tendency, dispersion, and probability laws in solving statistical and health-related problems.

CO3: Analyze and interpret health data using statistical distributions, hypothesis testing, correlation, and regression.

CO4: Utilize health information systems and statistical techniques in decision-making for public health and research applications.

Detailed Syllabus:

Module 1: Statistics & Samples
Handling & Presenting Numerical Information – Pie Diagram, Bar Diagram, Histogram, Frequency Polygon, Scatter Diagram.

Module 2: Measures of Central Tendency & Dispersion
Mean, Median & Mode; Measures of Dispersion; Variability – Range, Standard Deviation.

Module 3: Probability Distributions & Vital Statistics
Normal Distribution – Characteristics, Best Fitting Normal Distribution; Student's *t*-distribution.
Data Collection for Vital Statistics – Birth, Deaths, Foetal Deaths.

Module 4: Health Information
Data & Information, Health Information System – Components, Uses, Sources.
Basic Descriptive Methods, Distribution Tables.

Module 5: Frequency Distribution & Statistical Data Presentation
Frequency distribution, Presentation of Statistical Data, Measures of Central Tendency and Location, Measures of Dispersion.

Module 6: Probability & Inferential Statistics
Introduction to Probability, Measurement of Probability, Frequency Probability, Laws of Probability for Independent Events, Conditional Events.
Bayes' Theorem and its application in community screening programmes.

Decision Analysis, Sampling Variation and Bias, Methods of Sampling, Sampling & Non-sampling Errors. Test of Significance, Standard Errors, Chi-square Test, Correlation & Regression.

Suggested Readings

1. Hill A.B. – A Short Textbook of Medical Statistics, 10th Edition, ELBS.
2. Indervir Singh – Elementary Statistics for Medical Workers, Jaypee Brothers.
3. Rao N.S.N. – Elements of Health Statistics.
4. J. Susan Milton – Statistical Methods in the Biological & Health Sciences, McGraw-Hill.
5. P.S.S. Sunder Rao & J. Richard – An Introduction to Biostatistics: A Manual for Students in Health Sciences.
6. N.G. Das – An Introduction to Probability & Statistics, Vol. I & II.

(GE3B-07): DATA ANALYSIS WITH R

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

- Explore the R programming language and its different constructs.
- Understand the concept of data and data analysis**.**
- Use R programming to perform basic statistical data analysis.
- Learn how **to** install and configure software necessary for a statistical programming environment.
- Describe generic programming language concepts as they are implemented in a high-level statistical language.

Course Outcomes (CO):

Sl. No.	Course Outcome	Mapped Modules
CO1	Understand the background and history of R	M1
CO2	Understand the nuts and bolts of R	M2
CO3	Understand the concept of basic programming in R	M3, M4
CO4	Understand loops in R	M4
CO5	Understand functions and debugging in R	M5, M6
CO6	Understand simulation and profiling in R	M6

Detailed Syllabus:

Module 1: Introduction to R

- Getting started with R
- Installing R on Windows
- Writing Code / Setting Your Working Directory (Windows)
- Overview and History of R
- R Console Input and Evaluation

Module 2: Data Types and Data Handling

- R Objects and Attributes
- Vectors and Lists
- Matrices
- Factors
- Missing Values
- Data Frames
- Names Attribute
- Reading Tabular Data
- Reading Large Tables
- Textual Data Formats
- Interfaces to the Outside World

Module 3: Subsetting and Operations

- Subsetting – Basic

- Subsetting Lists and Matrices
- Partial Matching
- Removing Missing Values
- Vectorized Operations
- Working with swirl

Module 4: Control Structures and Functions

- Control Structures: If-else, For loops, While loops, Repeat, Next, Break
- Functions: User-defined functions, Anonymous functions

Module 5: Scoping and Coding Standards

- Scoping Rules – Symbol Binding
- R Scoping Rules
- Optimization Example
- Coding Standards
- Dates and Times

Module 6: Advanced Functions, Debugging and Simulation

- Loop Functions: lapply, apply, mapply, tapply, split
- Debugging Tools: Diagnosing the Problem, Basic Tools, Using the Tools
- The *str()* Function
- Simulation: Generating Random Numbers, Simulating a Linear Model, Random Sampling
- R Profiler

Module Wise Marks Distribution:

Module	Content	Total Hours	% of Questions	Blooms Level (if applicable)	Remarks (If any)
M1	Background, Getting Started	5	5	1	
M2	Basics of R programming	8	30	1,2,3	
M3	Subsetting	7	15	1,2,3	
M4	Control structures and Functions	12	30	1,2,3	
M5	Scoping rules and Loop functions	8	15	1,2,3	
M6	Debugging tools, simulation and profiler	5	5	1,2	
Total		**45**	**100**		

Suggested Readings:

1. R for Data Science – Hadley Wickham, Garrett Grolemund, O'REILLY
2. R Programming for Beginners – Sandip Rakshit, McGraw Hill
3. R Programming for Data Science – Roger D. Peng,
4. Beginner's Guide for Data Analysis using R Programming – Jeeva Jose

(GE3B-08): LEARN PROGRAMMING FUNDEMENTAL WITH C

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective:

- To build programming skills those are essential not only for software development but also for various other fields.
- To provide a strong foundation in problem-solving through the *Seven Steps Process*, enabling students to solve a class of programming problems effectively.
- To introduce students to algorithm development and help them progress towards reading and understanding code.
- To connect programming concepts with algorithmic thinking for better clarity and application.
- To use **C programming language** as a starting point for coding, as it is a tried-and-tested language that helps in understanding computing processes at a deeper level.

Course Outcome (CO):

Sl. No.	Course Outcome	Mapped Modules
CO1	Understanding program, programming and its requirements	M1
CO2	Understanding Algorithm	M2
CO3	Understanding Basic Data Types and Type Conversion	M3
CO4	Understanding C programming fundamentals, compiling, debugging, running program	M4
CO5	Understanding Data Types and Flow of Control	M5
CO6	Understanding Advanced Functions, Recursion, Arrays, and Pointers	M6

Detailed Syllabus

Module 1

- Powerful process for solving programming problems – *The Seven Steps*.
- Methodical approach to programming problems to formulate specific and correct algorithms.
- Executing code by hand – tracing and illustrating what each statement does.
- Understanding the state of the program during execution.

Module 2

- Types beyond integers – conceptual and hardware (binary) representations.
- Discussion of basic data types, "non-number" types, complex, and custom types.

Module 3

- History of C.
- Compiling, debugging, and running a program.
- Code examples: Circle code, Marathon code.
- Simple input/output examples: Fahrenheit conversion, Miles conversion.

- Character sets and tokens.
- Comments, Keywords, Identifiers.
- Operators, Expressions, and Precedence.
- Expression evaluation.
- Declarations and Fundamental types.
- Size of types and the char type.

Module 4

- Logical operators, expressions, and short-circuit evaluation.
- Conditional statements: if, if-else.
- Iterative statements: while, for, examples and explanations.
- Oddball operators – conditional (? :) and comma operator with examples.
- Break and Continue statements.
- Switch statement.
- Function definition, prototype, and scope rules.
- Return statement and function variables (call-by-value).
- Simple recursion: factorial and Fibonacci examples.
- Arrays and Pointers – initialization and usage.
- Concept of pointers, call-by-reference simulation.
- Arrays as parameters, bubble sort example, merge sort overview.

Module 5

- Enums as Abstract Data Types (ADT).
- C preprocessor and its usage.
- Use of assert for program correctness with examples.
- Introduction to struct (advanced ADTs).
- Accessing struct members.
- Introduction to ADT stack and its implementation.
- Using a stack to reverse a string.

Module 6

- Introduction to ADT list.
- Single element list code, full list code, and list processing details.
- Honors: Introduction to Binary Trees and detailed binary tree code.
- Introduction to File I/O – basic operations, example codes.
- File manipulation: double spacing a file.
- Use of main (argc, argv).
- Honors: List code with deletion.

Module Wise Marks Distribution:

Module	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks (If any)
Module 1	Will learn how to approach a programming problem methodically. This module discusses how to execute a piece of code by hand.	8	10%	2	–
Module 2	Discussion about the basic data types, "non-number" types, and complex/custom types.	8	10%	2	–
Module 3	History of C, compiling, debugging, and running a program with different examples.	8	20%	2, 3	–
Module 4	Logical operators, expressions, and short-circuit evaluation. Conditional statement (`if`, `if-else`). Iterative statements.	8	10%	2	–
Module 5	Enums as an ADT, Enums code, The C preprocessor, Use of `assert` for program correctness, Introduction to `struct`.	6	25%	2, 3	–
Module 6	Introduction to the ADT list, List of one element code, Full list code, Details of list processing, Introduction to binary trees (Honors).	7	25%	1, 2, 3	–
Total		**45**	**100%**	–	–

Suggested Reading:

1. AICTE Prescribed Textbook**:** Programming for Problem Solving (with Lab Manual) – Khanna Publishing House
2. Let Us C – Yashavant Kanetkar
3. The C Programming Language – Brian W. Kernighan & Dennis M. Ritchie
4. Practical C: Programming for Problem Solving – Venkatesh, Nagaraju Y

(GE3B-09): PROGRAMMING WITH PYTHON

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

- To introduce students to the fundamentals of programming using Python, focusing on constructing programs from simple instructions.
- To provide a beginner-friendly learning path with no prerequisites and minimal mathematics, accessible to anyone with moderate computer experience.
- To enable students to develop procedural programming skills and progress to advanced programming concepts after course completion.
- To explore Python's built-in data structures (lists, dictionaries, tuples) for performing data analysis.
- To teach students how to work with Internet-based data sources by scraping, parsing, and reading web data.
- To introduce handling of web APIs and different data formats (HTML, XML, JSON) in Python.

Course Objectives (CO):

Sl	Course Outcome (CO)	Mapped Modules
CO1	Understanding program, programming and its requirements	M1
CO2	Understanding decision statements and branching	M2
CO3	Understanding string and file manipulation	M3
CO4	Understanding list and dictionaries with examples	M4
CO5	Understanding tuples and regular expressions	M5
CO6	Understanding HTTP related to Python, JSON	M6

Detailed Syllabus:

Module 1:

- Definition of program, computer languages, Python as a language
- Installation of Python
- Writing simple Python code
- Data types (Basic)
- Expressions

Module 2:

- Conditional statements
- Using functions, working within functions
- Loops and iterators
- Definition of loop
- Different types of loops
- Functions and passing values to functions

Module 3:

- Strings
- Manipulating strings

- Writing programs using strings
- Files and processing files

Module 4:

- Lists
- Manipulating lists
- Lists and strings
- Dictionaries
- Counting with dictionaries
- Dictionaries and files

Module 5:

- Tuples
- Comparing tuples
- Dictionaries and tuples
- Using tuples as keys in dictionaries
- Sequences
- Character matching in regular expressions

Module 6:

- HTTP
- Retrieving images over HTTP
- Retrieving webpages with urllib
- Parsing HTML and scraping the web
- XML: parsing XML
- JSON: parsing JSON
- Security and API usage

Module Wise Marks Distribution:

Module	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks (If any)
Module 1	Introduction to Python, installation	3	10	1,2	–
Module 2	Decision statements, functions, looping	8	10	1,2	–
Module 3	String, Files	8	20	1,2	–
Module 4	List and Dictionaries	8	20	1,2	–
Module 5	Tuples and Regular Expressions	8	20	1,2	–
Module 6	Networking, HTTP, Web services, JSON	10	20	1,2,3	–
Total		**45**	**100**		

Suggested Readings:

1. Automate the Boring Stuff with Python – Al Sweigart, No Starch Press
2. Python: The Complete Reference – Martin C. Brown, McGraw Hill Education
3. Introduction to Python Programming – Venkatesh, Nagaraju Y
4. Taming Python by Programming – Jeeva Jose, Khanna Book Publishing
5. Python Official Documentation – Tutorial

(GE3B-10): CODE IN WITH JAVA

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To learn coding in Java and strengthen programming as well as problem-solving skills.
2. To design algorithms and develop/debug Java programs effectively.
3. To write programs using custom open-source classes for accessing and transforming images, websites, and other types of data.
4. To empower students to create advanced, personally meaningful Java programs.
5. To understand and apply the fundamentals of Object-Oriented Programming (OOP).
6. To learn how to leverage existing libraries for efficient program development.
7. To build graphical user interfaces (GUIs) in Java.
8. To implement and apply core algorithms for searching and sorting data.
9. To gain hands-on experience through a project-based approach, starting with practical projects immediately.

Course Objectives (CO):

Sl.	Course Outcome	Mapped Modules
CO1	Understanding programming, Java technology, and architecture	M1
CO2	Understanding Java class, data types, decision statements, and loops	M2
CO3	Understanding string handling, CSV libraries, and basic statistical operations	M3
CO4	Understanding objects, overloading, scope, and memory models	M4
CO5	Understanding GUI programming, inheritance, and polymorphism	M5
CO6	Understanding event-driven programming and implementing algorithms (searching & sorting)	M6

Detailed Syllabus

Module 1:

- Definition of program and different programming languages
- Discussion on Java Technology
- Using BlueJ to program in Java
- Variables, operators, functions, and conditions

Module 2:

- Classes, methods, and types
- Looping and different types of loops
- Packages in Java
- Writing basic programs

Module 3:

- Strings and string operations (positions in string)
- Java Math class
- Using CSV libraries (Apache Commons CSV)

- Devising algorithms using CSV data
- Analyzing CSV data across multiple CSV files
- Applying basic statistical operations

Module 4:

- Classes and objects
- Creating objects and method overloading
- Private, public, and access modifiers
- Memory models with primitive data and objects
- Introduction to scope

Module 5:

- GUI in Java, using PApplet
- Resizing images, color, canvas, loading/displaying images
- Setting up map visualization (image processing)
- Inheritance, reference vs. object types
- Visibility modifiers and class hierarchy
- Method overriding, polymorphism
- Abstract classes and interfaces

Module 6:

- Event-driven programming in Java
- Events in Unfolding Maps
- Buttons in Unfolding Maps
- Listener hierarchy
- Implementation of searching and sorting algorithms in Java

Module Wise Marks Distribution:

Module	Content	Total Hours	% of Questions	Blooms Level (if applicable)	Remarks (If any)
Module 1	Java technology and Architecture	3	10%	2	
Module 2	Java class, data types, decision statements, loops	8	10%	2	
Module 3	String, CSV libraries, basic statistical operations	8	20%	2,3	
Module 4	Objects, overloading, scope, memory models	3	10%	2	
Module 5	GUI Programming, inheritance, polymorphism	8	25%	2,3	
Module 6	Event-driven programming, implementing algorithm (searching & sorting)	15	25%	1,2,3	
Total		**45**	**100%**		

Suggested Readings

1. Java: The Complete Reference – Herbert Schildt, McGraw Hill Education
2. Image Processing in Java – Douglas A. Lynon, Prentice Hall
3. Data Structures, Algorithms and Applications in Java – Sartaj Sahni, Universities Press
4. Interview Questions with JAVA/J2EE – Arunesh Goyal, Khanna Publishing House
5. C, C++, JAVA & J2EE Interview Questions (with Ready Answers) – R.N. Satpathy, Bimal Kumar Sahoo, Khanna Publishing House
6. Oracle Java Documentation (Reference)

(GE3B-11): COMPUTER GRAPHICS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives

- Familiarize students with different computer graphics devices, display technologies, and fundamental concepts like resolution, refresh rate, and frame buffer.
- Develop an understanding of geometric objects, drawing algorithms, transformations, clipping, and curve generation.
- Enable students to apply mathematical concepts for projections and hidden surface elimination in 2D and 3D graphics.
- Build analytical and problem-solving skills by implementing algorithms for line drawing, circle drawing, clipping, transformations, and rendering.

Course Outcomes (CO):

Sl. No.	Course Outcome (CO)	Mapped Modules
CO1	Understand the applications of computer graphics, display devices, and basic concepts of digital graphics	M1
CO2	Implement and analyze line and circle drawing algorithms	M2
CO3	Apply 2D geometric transformations and understand matrix representation for graphics operations	M3
CO4	Demonstrate window-to-viewport transformation and apply different clipping algorithms	M4
CO5	Understand and apply curve generation techniques, projections, and hidden surface elimination methods	M5

Detailed Syllabus

Module 1: **[5L]**
Application of Computer Graphics, Graphics Devices, Cathode Ray Tube, Liquid Crystal Device, Raster Scanning, Random Scanning, Refresh Rate, Resolution, Aspect Ratio, Frame Buffer, Refresh Buffer.

Module 2: **[8L]**
Points and Lines, DDA Line Drawing Algorithm, Bresenham's Line Drawing Algorithm, Midpoint Circle Drawing Algorithm, Bresenham's Circle Drawing Algorithm.

Module 3: **[12L]**
2D Geometric Transformation: Basic Transformation, Translation, Rotation, Scaling, Matrix Representation, Homogeneous Coordinates, Composite Transformations, Pivot Point Rotation, Fixed Point Scaling, Reflection, Shearing, General 3D Rotations, Translation, Scaling.

Module 4: **[10L]**
Window-to-Viewport Coordinate Transformation, Clipping Operations: Point Clipping, Line Clipping, Cohen-Sutherland Line Clipping Algorithm, Midpoint Subdivision Line Clipping Algorithm, Liang-Barsky Line Clipping Algorithm, Polygon Clipping, Sutherland-Hodgeman Polygon Clipping Algorithm.

Module 5: **[10L]**
Curve Generation, Interpolation & Approximation Methods, Parametric Continuity Condition, Properties of Bezier Curve, Cubic Bezier Curve, Parallel Projection, Perspective Projection, Visible Surface Detection, Z-Buffer Method.

List of Experiments (Using C Programming)

1. Study of graphics preliminaries with different shapes, objects, and color assignments.
2. Implementation of DDA Line Drawing Algorithm.
3. Implementation of Bresenham's Line Drawing Algorithm**.**
4. Implementation of Midpoint Circle Drawing Algorithm.
5. Implementation of Bresenham's Circle Drawing Algorithm.
6. Implementation of basic geometric transformations – Translation, Rotation, Scaling, and Reflection of objects.
7. Implementation of composite transformations – Translation, Rotation, and Scaling on geometric objects.
8. Implementation of Cohen-Sutherland Line Clipping Algorithm.
9. Implementation of Liang-Barsky Line Clipping Algorithm**.**
10. Implementation of a mini graphics application (e.g., Moving Boat, Rotating Wheel, Olympic Symbol, etc.).

Module Wise Marks Distribution:

Module	Name of the Topics	Marks
1	Application of Computer Graphics, Graphics Devices, Cathode Ray Tube, Liquid Crystal Device, Raster Scanning, Random Scanning, Refresh Rate, Resolution, Aspect Ratio, Frame Buffer, Refresh Buffer.	8
2	Points and Lines, DDA Line Drawing Algorithm, Bresenham's Line Drawing Algorithm, Midpoint Circle Drawing Algorithm, Bresenham's Circle Drawing Algorithm.	10
3	2D Geometric Transformation: Basic Transformation, Translation, Rotation, Scaling, Matrix Representation, Homogeneous Coordinates, Composite Transformations, Pivot Point Rotation, Fixed Point Scaling, Reflection, Shearing, General 3D Rotations, Translation, Scaling.	25
4	Window-to-Viewport Coordinate Transformation, Clipping Operations: Point Clipping, Line Clipping, Cohen-Sutherland Line Clipping Algorithm, Midpoint Subdivision Line Clipping Algorithm, Liang-Barsky Line Clipping Algorithm, Polygon Clipping, Sutherland-Hodgeman Polygon Clipping Algorithm.	15
5	Curve Generation, Interpolation & Approximation Methods, Parametric Continuity Condition, Properties of Bezier Curve, Cubic Bezier Curve, Parallel Projection, Perspective Projection, Visible Surface Detection, Z-Buffer Method.	12

Text Books:

1. **Donald Hearn, M. Pauline Baker** – Computer Graphics C Version, 2nd Edition, Pearson.
2. **Zhigang Xiang, Roy A. Plastock** – Theory and Problems of Computer Graphics, 2nd Edition, Tata McGraw-Hill.
3. **Yashavant Kanetkar** – Graphics Under C, 3rd Edition, BPB Publication.

Reference Books:

1. **James D. Foley, Andries Van Dam, Steven K. Feiner, F. Hughes John** – Computer Graphics – Principles & Practice in C, 2nd Edition, Pearson.
2. **Anirban Mukhopadhyay, Arup Chattopadhyay** – Graphics & Multimedia, 2nd Edition, Vikas Publishing.

(GE3B-12): COMPUTER BASICS AND MULTIMEDIA SOFTWARE

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

- To understand the basic concepts of computers, operating systems and information technology tools.
- To learn the use of Microsoft Office tools (Word, Excel, Power Point) for professional documentation and presentations.
- To gain knowledge of online tools and Google applications for effective communication and collaboration.
- To develop practical skills in creating reports, spreadsheets, and presentations as per contemporary industry requirements.

Course OutcomeS (CO):

CO No	Course Outcome
CO1	Demonstrate understanding of basic computer concepts, operating systems, and IT fundamentals.
CO2	Apply MS Word and Excel to create documents, spreadsheets, and charts effectively.
CO3	Use PowerPoint and other presentation tools to create professional presentations.
CO4	Utilize Google tools and online platforms for communication, collaboration, and data management.

Detailed Syllabus:

Module 1: **[10L]**

- Data and Information: Analog vs Digital
- Types of computer memory
- Operating Systems: Windows, iOS, Android, Linux

Module 2: **[5L]**

- Basic Computer Language

Module 3: **[10L]**

- MS Office Package: Word, PowerPoint, Excel, Outlook
- Networking and Email: LAN, MAN, WAN, Baseband, Broadban

Module 4: **[10L]**

- Basics of HTML
- Google Tools: Docs, Slides, Spreadsheets, Forms, Drive

Hours: 10

Module 5: **[10]**

- Database Management System (DBMS)

Suggested Readings:

1. Computer Basics and C Programming – V Rajaram
2. HTML 5.0 For Beginners – Vinod Kumar Murugesan

(GE3B-13): DATA ANALYSIS WITH SPSS

Credit Point: 3
Total Credit Hours: 45 Hrs.

CourseObjective:

- To enable students to solve research questions using SPSS software.
- To teach students how to manage and analyze data collected from survey questionnaires.
- To familiarize students with selecting appropriate statistical techniques for different types of data.
- To train students to interpret results obtained from SPSS analyses.
- To expose students to practical applications of statistical data analysis using SPSS.

Course Outcomes (CO):

SI	Course Outcome	Mapped Modules
CO1	Understanding SPSS interface and types of data	M1
CO2	Understanding how to work with data files, table layouts, and changing font style and size	M2
CO3	Understanding how to work with various kinds of diagrams	M3
CO4	Understanding how to work with descriptive statistics and correlation using SPSS	M4
CO5	Understanding how to work with testing of hypotheses	M5

Detailed Syllabus:

Module 1: Interface **[5L]**
Covers Windows, types of windows, variable names, variable labels in dialog boxes, data types, measurement levels, variable list, auto recovery, and restore point.

Module 2: Data Handling **[10L]**
Covers opening SPSS data files, saving files, importing from other data sources, data entry, labeling for dummy numbers, recoding into the same or different variables, transposing data, inserting variables and cases, merging variables and cases. Also includes split/select cases, computing total scores, table layouts, and changing column font styles and sizes.

Module 3: Diagrammatic Representation **[10L]**
Covers creating simple bar diagrams, multiple bar diagrams, subdivided bar diagrams, percentage diagrams, pie charts, frequency tables, histograms, scatter diagrams, and box plots.

Module 4: Descriptive Statistics **[10L]**

Covers measures of central tendency (mean, median, mode), measures of dispersion (standard deviation, skewness, kurtosis), correlation (Karl Pearson's and Spearman's rank correlation), and regression analysis (simple and multiple regression).

Module 5: Testing of Hypothesis **[10L]**

Covers parametric tests (one-sample t-test, two-sample independent t-test, paired t-test) and non-parametric tests (one-sample KS test, Mann-Whitney U test, Wilcoxon signed rank test, Kruskal-Wallis test, Friedman test, Chi-square test). Also includes analysis of variance (one-way and two-way ANOVA).

Module Wise Marks Distribution:

Module	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks (If any)
Module 1	Interface: SPSS interface, types of windows, variable names, variable labels in dialog boxes, data types, measurement levels, variable list, auto recovery, restore point	5	15	1	
Module 2	Data Handling: Open/save/import data files, data entry, labeling for dummy numbers, recoding variables, transpose data, insert/merge variables and cases, split/select cases, compute totals, table layout, change column font/style	10	15	2.2	
Module 3	Diagrammatic Representation: Simple bar diagram, multiple bar diagram, subdivided bar diagram, percentage diagram, pie chart, frequency table, histogram, scatter diagram, box plot	10	20	2	
Module 4	Descriptive Statistics: Mean, median, mode, SD, skewness, kurtosis, correlation (Pearson/Spearman), regression (simple/multiple)	10	25	2.3	
Module 5	Testing of Hypothesis: Parametric (t-tests), Non-parametric (KS, Mann-Whitney, Wilcoxon, Kruskal-Wallis, Friedman, Chi-square), ANOVA (one-way, two-way)	10	25	2.3	
Total		**45**	**100**		

References:

1. Jeeva Jose, Beginners Guide for Data Analysis using R Programming, Khanna Publishing House.
2. Munesh Chandra Trivedi & Anil Kumar Dubey, Data Science and Data Analytics Using Python, Khanna Publishing House.
3. Clifford E. Lunneborg (2000), Data Analysis by Resampling: Concepts and Applications, Dusbury Thomson Learning, Australia.
4. B. S. Everitt & G. Dunn (2001), *Applied* Multivariate Data Analysis, Arnold, London.
5. Jeremy J. Foster (2001), Data Analysis Using SPSS for Windows, New edition Versions 8–10, Sage Publications, London.
6. Michael S. Louis–Beck (1995), Data Analysis: An Introduction, Series: Quantitative Applications in the Social Sciences, Sage Publications, London.

(G43B-01): ENTREPRENEURSHIP THEORY & PRACTICE

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To understand the function of the entrepreneur in the successful, commercial application of innovations.
2. To investigate methods and behaviors used by entrepreneurs to identify business opportunities and implement them.
3. To discuss how ethical behavior impacts business decisions in a selected business startup.
4. To gain knowledge about the essential traits required for successful entrepreneurship.
5. To build and assess the feasibility of business projects and develop them effectively.
6. To provide an overview of business ethics and its significance.
7. To understand various management and business scenarios involving ethics.
8. To gain overall knowledge of corporate culture and its impact on business.

Course Objectives (CO):

SL NO.	Course Outcome	Mapped Modules
1	This will help to understand the basics and needs of Entrepreneurship.	Module I – Unit 1
2	This will help entrepreneurs develop the necessary skills and knowledge to run their business effectively.	Module I – Unit 2
3	This unit helps to generate startups with various business decisions.	Module I – Unit 3
4	Helps the student to develop certain skills of Entrepreneurship.	Module I – Unit 4
5	This helps to develop business projects and build business plans.	Module II – Unit 5
6	Student will be able to describe examples of entrepreneurial ventures, both successful and unsuccessful, and explain the role and significance of entrepreneurship as a career, in a firm, and in society.	Module II – Unit 6

Detailed Syllabus:

Module I: Entrepreneurship Fundamentals

Unit 1: Introduction to Entrepreneurship **[3L]**

- Theories of Entrepreneurship
- Role and Importance of Entrepreneur in Economic Growth

Unit 2: Entrepreneurial Behaviour **[10L]**

- Entrepreneurial Motivation
- Need for Achievement Theory
- Risk-taking Behavior
- Innovation and the Entrepreneur

Unit 3: Entrepreneurial Traits **[6L]**

- Definitions and Characteristics of Entrepreneurs
- Entrepreneurial Types
- Functions of Entrepreneurs

Unit 4: Project Feasibility Analysis **[8L]**

- Business Ideas – Sources and Processing
- Input Requirements and Sources of Financing
- Technical and Marketing Assistance
- Preparation of Feasibility Reports
- Legal Formalities and Documentation

Module II: Creativity, Innovation, and Market Understanding

Unit 5: Creativity **[4L]**

- Introduction, Meaning, and Scope
- Types of Creativity
- Importance of Creativity
- Steps of Creativity

Unit 6: Innovation **[4L]**

- Introduction to Innovation
- Steps and Stages of Innovation
- Technology Aspects in Innovation

Unit 7: Understanding the Market – 4L

- Types of Business: Manufacturing, Trading, Services
- Market Research – Concept, Importance, and Process
- Market Sensing and Testing

Unit 8: Resource Mobilization **[6L]**

- Types of Resources – Human, Capital, Entrepreneurial Tools
- Selection and Utilization of Human Resources and Professionals (Accountants, Lawyers, Auditors, Board Members)
- Role and Importance of a Mentor
- Estimating Financial Resources Required
- Methods to Meet Financial Requirements – Debt vs. Equity

Suggested Readings:

1. Entrepreneurship – Arya Kumar, Pearson
2. Developing Thinking Skills (The Way to Success) – E. Balaguruswamy, Khanna Book Publishing
3. Introducing Entrepreneurship Development – Chakraborty, Tridib, Modern Book Agency
4. Entrepreneurial Policies and Strategies – Manimala, M.J., TMH
5. Everyday Entrepreneurs – The Harbingers of Prosperity and Creators of Jobs – Dr. Aruna Bhargava

(G43B-02): ACCOUNTING

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective:

- Build a foundation to understand the various concepts of Financial Accounting.
- Gain a better understanding of accounting mechanics, accounting standards, and dealing with financial statements of companies.

Course Outcomes (CO):

CO 1- To articulate the financial concepts of accounting in companies.

CO 2- To gain a clear understanding of Financial Accounting with the help of case studies.

Detailed Syllabus:

Chapter 1: Introduction to Accounting **[3L]**

- Introduction to concepts of Accounting
- Concept and necessity of Accounting
- Overview of Income Statement and Balance Sheet

Chapter 2: Introduction and Meaning of GAAP **[3L]**

- Introducing the meaning of GAAP
- Concepts of Accounting
- Impact of Accounting
- Concepts on Income Statement and Balance Sheet

Chapter 3: Accounting Mechanics **[3L]**

- Understanding Accounting Mechanics
- Process leading to preparation of Trial Balance and Financial Statements

Chapter 4: Preparation of Financial Statements **[3L]**

- Understanding the Preparation of Financial Statements with Adjustment Entries

Chapter 5: Revenue Recognition and Measurement **[4L]**

- Describing Revenue Recognition and Measurement
- Capital and Revenue Items
- Treatment of R&D Expenses
- Preproduction Cost
- Deferred Revenue Expenditure

Chapter 6: Fixed Assets and Depreciation Accounting **[4L]**

Describing Fixed Assets and Depreciation Accounting

- Evaluation and Accounting of Inventory

Chapter 7: Preparation and Complete Understanding of Corporate Financial Statements [3L]

- Preparation and Complete Understanding of Corporate Financial Statements
- 'T' Form and Vertical Form of Financial Statements

Chapter 8: Important Accounting Standards [5L]

- Corporate Financial Reporting – Analysis and Interpretation
- Ratio Analysis, Fund Flow, Cash Flow
- Corporate Accounting for Joint Stock Companies: Overview of Share Capital and Debentures, Accounting for Issue and Forfeiture of Shares, Issue of Bonus Share, Issue of Debentures

Chapter 9: Financial Statements of Companies [5L]

- Income Statement and Balance Sheet in Schedule VI
- Provisions of the Companies Act affecting preparation of Financial Statements
- Creative Accounting, Annual Report, Presentation and Analysis of Audit Reports and Directors' Report

Chapter 10: Inflation Accounting & Ethical Issues in Accounting [3L]

- Describing Inflation Accounting
- Ethical Issues in Accounting

Chapter 11: Case Studies and Presentations [10 L]

- Case Studies and Presentations

Chapter Wise Marks Distribution:

Chapter	Name of the Topic	Hours	Marks
01	Introduction to Accounting	3	6
02	Introduction and Meaning of GAAP	3	-
03	Accounting	3	-
04	Preparation of Financial Statements with Adjustment Entries	3	6
05	Revenue Recognition and Measurement	4	6
06	Fixed Assets and Depreciation Accounting	3	6
07	Preparation and Complete Understanding of Corporate Financial Statements	3	6
08	Important Accounting Standards	5	6
09	Financial Statements of	5	6
10	Inflation Accounting & Ethical Issues in Accounting	3	6
11	Case Studies and Presentations	10	10
Total		**45**	**70**

Text Books:

1. P.C. Tulsian, Financial Accounting, 2002, ISBN: 9788177582284, Pearson.
2. Gregory Becker, Accounting Principles: The Ultimate Beginners Guide to Accounting, Pearson.
3. Manish Sharma, Amit Gupta, The Practice of Business Statistics, Khanna Publishing House.

Reference Books:

1. M.C. Shukla, S. Gupta, T.S. Grewal, Advanced Accounting Vol - I, 2018, S. Chand.
2. M.C. Shukla, S. Gupta, T.S. Grewal, Advanced Accounting Vol - II, 2018,, S. Chand.

(G43B-03): PRINCIPLES OF MANAGEMENT & ORGANIZATIONAL BEHAVIOUR

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

- To help the students develop cognizance of the importance of management principles.
- To understand the planning process in an organization.
- To enable students to analyze and understand the organizational environment.
- To study the systems and processes of effective controlling within organizations.
- To understand the concept of behavior in organizational settings and to explain, predict, and influence the behavior of others.
- To help students develop concepts of human behavior.
- To understand the concept of motivation and learn how to motivate people for their work according to various theories.
- To enable students to understand group behavior and the communication process in an organization.
- To help students develop the process of leading individuals and managing conflicts.
- To enable students to understand organizational culture and execute strategies according to situational requirements.

Course Outcomes (CO):

SL No.	Course Outcome	Mapped Modules
1	Students will be able to have clear understanding of managerial functions like planning, and have basic knowledge on international aspects of management.	Module I – Unit 1
2	Students will be able to explain the relationship between strategic, tactical, and operational plans.	Module I – Unit 2
3	Students will be able to understand the concept of organization.	Module I – Unit 3
4	Students will be able to analyze, isolate issues, and formulate best control methods.	Module I – Unit 4
5	Students will be able to develop insight on how employees behave & perform in the workplace.	Module II – Unit 5
6	Students will gain knowledge to improve personal adjustment & interpersonal relationships.	Module II – Unit 6
7	Students will be able to analyze & compare different models used to explain individual behavior related to motivation & rewards.	Module II – Unit 7
8	Students will be able to explain group dynamics & demonstrate skills required for working in groups.	Module II – Unit 8
9	Students will learn to explore & develop a sense of confidence & belief in themselves & their ideas.	Module II – Unit 9
10	Students will be able to understand how organizational culture influences the behavior of organizational members.	Module II – Unit 10

Detailed Syllabus:

Module I:

Unit 1: Introduction to Management **[3L]**

- Nature, purpose and scope of management
- Skills and roles of a Manager
- Functions of Management
- Development of Management Theories (Classical, Neo-Classical and Modern)

Unit 2: Planning Process **[4L]**

- Types of plans
- Levels of planning
- Planning process
- Management by objectives
- Strategic management
- Premising and forecasting
- Decision-making process: barriers and styles of decision making

Unit 3: Organizing Procedure **[5L]**

- Organizational design and structure
- Coordination
- Centralization and decentralization
- Delegation
- Authority and power – concept and distinction
- Line and staff organizations

Unit 4: Controlling System **[5L]**

- Concept of control
- Planning-control relationship
- Process of control
- Types of control
- Control techniques
- Staffing: Human Resource Management and Selection

Module II:

Unit 5: Introduction to Organizational Behaviour **[3L]**

- Nature and determinants of organizational behaviour
- Need for knowledge of OB
- Contributing disciplines to the field
- OB Model

Unit 6: Individual Differences **[5L]**

- Learning
- Values and attitudes

- Personality: MBTI, Big Five Model
- Emotional Intelligence
- Perception
- Attribution theory

Unit 7: Work Motivation **[5L]**

- Early Theories: McGregor's Theory X & Y, Maslow's Need Hierarchy Theory, Herzberg's Two-Factor Theory
- Contemporary Theories: McClelland's Three Needs Theory, Alderfer's ERG Theory, Adam's Equity Theory, Vroom's Expectancy Theory, Goal Setting Theory
- Application of Motivation Theories
- Workers' participation in management

Unit 8: Group Behaviour **[5L]**

- Types of groups
- Stages of group development
- Group decision making
- Teamwork: types of teams, creating effective teams
- Communication: significance, types, barriers, overcoming barriers

Unit 9: Leadership **[5L]**

- Basic Approaches: Trait Theories, Behavioral Theories, Contingency Theories
- Contemporary issues in leadership
- Conflict: levels of conflict, resolving conflicts
- Power and politics: sources of power, use of power

Unit 10: Organization Culture and Change **[5L]**

- Effects of organizational culture
- Changing organizational culture
- Forces of change
- Resistance to change
- The change process

Suggested Readings:

1. Principles of Management – Premvir Kapoor, Khanna Book Publishing Company, New Delhi.
2. Management – Robbins, Stephen P. and Mary Coulter, Prentice Hall, New Delhi.
3. Organizational Behavior – Stephen P. Robbins, Prentice Hall.
4. Principles of Management – Govindarajan & Natarajan, Prentice Hall of India Pvt. Ltd.
5. Management – Stoner, Freeman & Gilbert Jr., Prentice Hall of India Pvt. Ltd.
6. Organizational Behavior: Human Behavior at Work – John W. Newstrom & Keith Davis, Tata McGraw-Hill.

(G43B-04): BASICS OF ACCOUNTING AND FINANCE IN HEALTHCARE MANAGEMENT

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives

1. To understand the meaning of accounting, different accounting concepts and principles.
2. To understand the rules of journal, ledger, and trial balance.
3. To understand different concepts and methods of depreciation and provision.
4. To understand the preparation of final accounts with different adjustments.
5. To understand the knowledge of business finance, financial management, and management decision.
6. To understand the concept and classification of working capital and the importance of working capital management.

Course Outcomes (COs):

SL No.	Course Outcome (COs)	Mapped Modules
1	Ability to know the objective and advantages of accounting.	Module I – Unit 1
2	Ability to record journal entries, post to the ledger, and prepare trial balance.	Module I – Unit 2
3	Ability to calculate depreciation by applying various methods.	Module I – Unit 3
4	Ability to prepare trading account, profit & loss account, and balance sheet with adjustments.	Module I – Unit 4
5	Ability to determine the value and wealth maximization of business and scope of financial management.	Module II – Unit 5
6	Ability to compute working capital using both the cash cost approach and the operating cycle approach.	Module II – Unit 6

Detailed Syllabus

Module I:

Unit 1: Meaning and Scope of Accounting **[3L]**

- Accounting: meaning, objectives, scope, and advantages
- Accounting Principles: GAAP, Accounting Concepts, and Accounting Conventions
- Cash Basis and Accrual Basis of Accounting

Unit 2: Recording of Business Transactions **[10L]**

- Accounting Cycle
- Golden Rule of Accountancy
- Journal, Ledger, Trial Balance
- Capital and Revenue expenditure

Unit 3: Depreciation and Provision **[6L]**

- Concept and causes of Depreciation
- Depletion and Amortization
- Depreciation accounting
- Methods of recording depreciation: Straight Line Method and Diminishing Balance Method
- Provision and Reserve:

  i. Provision for Doubtful Debts
  ii. Provision for Discount on Debtors
  iii. Provision for Discount on Creditors
  iv. Difference between Provision and Reserve

Unit 4: Preparation of Final Accounts **[10L]**

- Trading Account
- Profit and Loss Account
- Balance Sheet
- Adjustment entries with respect to:

  i. Closing stock
  ii. Outstanding expenses
  iii. Prepaid expenses
  iv. Pre-received income
  v. Accrued income
  vi. Depreciation
  vii. Provision for bad debts
  viii. Stock lost by fire
  ix. Goods withdrawn by proprietors
  x. Free sample distribution

Module II:

Unit 5: Introduction to Financial Management **[6L]**

- Meaning, Core Elements, Objectives, and Scope
- Role of Finance Manager
- Profit vs. Goal Maximization
- Investment Decision, Financing Decision, Dividend Decision

Unit 6: Working Capital Management **[10L]**

- Definition and Classification of Working Capital
- Factors of Working Capital Management
- Operating Cycle
- Practical problems on Working Capital Requirement

Suggested Readings

1. Financial Accounting – Ashoke Banerjee, Excel Books
2. Financial Accounting – Basu & Das, Rabindra Library
3. Financial Accounting – M. Hanif & A. Mukherjee, TMH
4. Financial Management: Theory and Practice – Prasanna Chandra, TMH
5. Financial Management – I. M. Pandey, Vikas Publishing House Pvt. Ltd.

(G43B-05): MACROECONOMICS IN BUSINESS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To understand the differentiation between macroeconomics and microeconomics, along with the scope of macroeconomics.
2. To demonstrate the concepts of national income accounting with all the measurement parameters.
3. To determine the concept of multiplier in the economy, along with income and savings function.
4. To describe the IS–LM framework and the effectiveness of fiscal and monetary policy.
5. To understand the concepts of demand and supply of money and analyze the effects of inflation in the economy.
6. To explore the concepts of balance of trade and balance of payments in relation to international trade theories.

CourseOutcomeS (CO):

SL No.	Course Outcome	Mapped Module
1	Students will be able to define macroeconomics.	Unit 1
2	Students will be able to explain how economic indicators like GDP are used to assess the state of the economy and differentiate between and calculate nominal and real GDP.	Unit 2
3	Students will be able to examine factors that shift aggregate supply and aggregate demand, explain why multiplier works, and calculate its size.	Unit 3
4	Students will be able to understand fiscal policies, including automatic, expansionary, and contractionary fiscal policies, explain how monetary policy affects GDP and interest rates, and establish general equilibrium in real and monetary sector.	Unit 4
5	Students will be able to define money and inflation, explain the functions of money, define liquidity and how money is created by lending, and demonstrate controlling measures of inflation.	Unit 5
6	Students will be able to understand the Balance of Payment statement and international trade theory.	Unit 6

Detailed Syllabus:

Module I:

Unit 1: Concepts of Aggregate Demand & Supply **[8L]**

- Macroeconomics – scope and basic concepts
- Concept of Aggregate Demand and Aggregate Supply
- Marginal Propensity to Consume (MPC), Average Propensity to Consume (APC), Marginal Propensity to Save (MPS), Marginal Propensity to Invest (MPI) – basic concepts only

- Paradox of thrift

Unit 2: National Income **[10L]**

- National Income Accounting: Concepts and measurement of GDP, GNP, NNP, NI and DPI
- Circular flow of income
- Real and Nominal GDP
- Implicit deflator

Unit 3: Income Determination **[10L]**

- Theory of Equilibrium Income Determination: Simple Keynesian Model
- Consumption, saving and investment functions
- National income determination
- Investment and Government expenditure multipliers

Module II:

Unit 4: IS–LM Framework **[8L]**

- Commodity market and Money market equilibrium
- Derivation of IS and LM curves
- Shifts of IS and LM curves
- Equilibrium in IS–LM model
- Effectiveness of monetary and fiscal policies

Unit 5: Money and Inflation **[12L]**

- Concept of demand for and supply of money
- Quantity theory of money and Keynesian theory of demand for money
- Measures of money supply – High powered money – Money multiplier
- Concept of Inflation – Demand-pull and Cost-push theories of inflation
- Monetary and fiscal policies to control inflation – Instruments, objectives and limitations

Unit 6: Balance of Payments **[12L]**

- Items of Balance of Payments (BOP)
- Causes of Disequilibrium in BOP
- Strategies to Correct Adverse BOP Situation
- Purchasing Power Parity Theory (basic concept)
- Absolute and Comparative Cost Advantage Theory
- Gains from international trade

Suggested Readings:

1. W.H. Branson, Macroeconomic Theory and Policy
2. Joydeb Sarkhel, Macroeconomic Theory
3. Banerjee & Majumdar, Fundamentals of Business Economics
4. Dornbusch, Fischer & Startz, Macroeconomics, TMH
5. Debes Mukherjee, Essentials of Micro and Macroeconomics, Central
6. Premvir Kapoor, Sociology & Economics for Engineers

(G43B-06): BUSINESS REGULATORY FRAMEWORK

Credit Point: 3
Total Credit Hours: 45 Hrs.

CourseObjectives:

1. To understand the basic concepts of Indian Contract Act, 1872.
2. To understand the concepts of Sale of Goods Act, 1930.
3. To know the concepts of Negotiable Instrument Act, 1881.
4. To know the concepts of Consumer Protection Act, 1986.
5. To understand the concepts of Companies Act, 2013.
6. To explore the issues related to Information Technology Act, 2000.

Course Outcomes (CO):

Sl. No.	Course Outcome	Mapped Modules
1	Memorize the basic concepts of Indian Contract Act, 1872	Module I – Unit 1
2	Understand the concepts of Sale of Goods Act, 1930	Module I – Unit 2
3	Memorize the concepts of Negotiable Instrument Act, 1881	Module I – Unit 3
4	Memorize the concepts of Consumer Protection Act, 1986	Module II – Unit 4
5	Understand the concepts of Companies Act, 2013	Module II – Unit 5
6	Learn the concepts of Information Technology Act, 2000	Module II – Unit 6

Detailed Syllabus
Module I:

Unit 1: Indian Contract Act, 1872 [12L]

- Elements of contract – Offer and Acceptance, Consideration, Legal capacity
- Intention to create legal relations, Free Consent, Legality of the Object
- Possibility of Performance, Void and Voidable Agreement, Contingent Contract
- Discharge of Contract, Indemnity and Guarantee, Quasi Contract
- Bailment and Pledgement, Agency Contract

Unit 2: Sale of Goods Act, 1930 [12L]

- Formation of contracts of sale
- Goods and their classification, Price
- Conditions & Warranties, Performance of contract of sale
- Unpaid seller and his rights
- Hire Purchase Agreement, Auction

Unit 3: Negotiable Instrument Act, 1881 [10L]

- Definition and features of negotiable instruments
- Types of negotiable instruments
- Dishonor of a Negotiable Instrument

Module II:

Unit 4: Consumer Protection Act, 1986 [10L]

- Concept of consumer protection
- Consumer Protection Councils
- Dispute Redressal Procedures

Unit 5: Companies Act, 2013 (10L)

- Concept and types of companies
- Steps in formation of a company
- Concept and features of AOA, MOA, and Prospectus
- Company meetings

Unit 6: Information Technology Act, 2000 (6L)

- Overview of Computer and Web Technology
- Need for Cyber Law, Cyber Jurisprudence (International & Indian level)
- Jurisdictional Aspects in Cyber Law – Issues and Types of jurisdiction
- Cyber Crimes vs Conventional Crimes, Reasons for cybercrimes
- Cyber Crimes against Individuals, Institutions, and State

Suggested Readings

1. Sen & Mitra: Commercial Law, World Press
2. Pathak: Legal Aspect of Business, TMH
3. Das & Ghosh: Business Regulatory Framework, Ocean Publication, Delhi
4. Pillai & Bagavathi: Business Law, S. Chand
5. Tulsian: Business Law, Tata McGraw-Hill

(G43B-07): DECISION SUPPORT SYSTEM

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective:

1. To review and clarify the fundamental terminologies, ideas, and concepts associated with Decision Support Systems and other aligned systems.
2. To discuss and grow skills in the analysis, design, and implementation of computerized Decision Support Systems.
3. To understand and evaluate the importance of Decision Support Systems in organizational and social context.

Course Outcomes (CO):

Sl	Course Outcome	Mapped Modules
1	Remembering	M1, M2, M3, M4, M5, M6
2	Understanding the course	M1, M2, M3, M4, M5, M6
3	Applying the general problem	M3, M4, M5, M6
4	Analyse the problems	M2, M4, M5
5	Evaluate the problems after analysing	M2, M3
6	Create using the evaluation process	M1, M2 (Case study), M3, M4, M5, M6

Detailed Syllabus:

Module 1:[10L]
Understand concepts of a Decision Support System (DSS) and its effect on management, purpose of a DSS.
Data warehousing. Differentiate between the data warehouse, Data Marts, and Data Mining.
Differentiate between OLAP and OLTP systems. Contrast data, information, and knowledge as they apply to the DSS.
Define computer-based inferencing. Discuss various tools assisting IT professionals surrounding DSS.

Module 2:[10L]
Application of DSS techniques to real-world scenarios and situations.
Construct an expert system using a programming language or the Microsoft Office suite of tools.
Perform data analysis using Microsoft Excel pivot tables. Apply the Nominal Group Technique (NGT) and the Delphi method.
Use linear programming methods to solve multivariate problems.

Module 3: [7L]
Excel Basics, Formatting, Referencing and Names, Functions and Formulas.
Charts: When to use which chart.

Module 4:[6L]
Advanced Excel functions: vlookup, hlookup, fuzzy lookup, match, index, statistical functions, etc.

Module 5:[6L]
Pivot Tables, Statistical Analysis, The Solver, and other tools (what-if analysis, etc.).

Module 6: [6L]
Introduction to VBA, Recording Macros, Objects, and Variables.

Module Wise Marks Distribution:

Module Number	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks (If any)
M1	Introduction	10	10	L1, L2	
M2	Application of DSS techniques	10	25	L1, L2, L4	
M3	Excel Basics	7	10	L1, L2, L3	
M4	Advanced Excel functions	6	25	L1, L2, L3, L4	
M5	Pivot tables and statistical functions	6	25	L1, L2, L3, L4	
M6	Intro to VBA	6	5	L1, L2, L3	
Total		**45**	**100**		

Suggested Readings:

1. Clyde W. Holsapple: Decision Support Systems: A Knowledge Based Approach, West Group.
2. Douglas Schwartz: Decision Support Systems, Clanrye International.
3. Clyde W. Holsapple: Decision Support Systems: Theory and Application, Springer-Verlag.
4. Manish Nigam: Advance Excel 2019 Training Guide: Tips and Tricks to Kickstart Your Excel Skills, BPB Publications.
5. Wayne Winston: Microsoft Excel Data Analysis and Business Modeling, Microsoft Press.

(G43B-08): ENTREPRENEURSHIP: LAUNCHING INNOVATIVE BUSINESS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective

- Assist aspiring and active entrepreneurs in developing great ideas into successful companies.
- Highlight how strong economies provide rich opportunities for new venture creation.
- Emphasize the importance of entrepreneurship in challenging economic times, where many must create their own jobs.
- Develop the skills required to identify, evaluate, and act on innovative business opportunities.
- Help aspiring and active entrepreneurs understand how to secure funding for their companies.

Course Outcomes (CO):

Sl. No.	Course Outcome	Mapped Modules
1	Identifying and analyzing entrepreneurial opportunities	M1, M2, M3, M4, M5, M6
2	Enhancing entrepreneurial mindset	M1, M2
3	Improving strategic decision-making	M1, M2, M3, M4
4	Developing the ability to build innovative business models	M1, M3, M4
5	Exploring kinds of investors by stage	M5, M6
6	Understanding different fund-raising options	M5, M6

Detailed Syllabus

Module 1: Introduction to Innovation and Entrepreneurship

- What is entrepreneurship? Who is an entrepreneur?
- Entrepreneurship, creativity, and innovation.
- Entrepreneurial opportunities, factors influencing the feasibility of an innovation.
- The world's most innovative companies.
- Types of innovation.
- Entrepreneurs and strategic decisions.
- The opportunity analysis canvas.

Module 2: Entrepreneurial Mindset, Motivations, and Behaviors

- Introduction to entrepreneurial mindset, motivations, and behaviors.
- Entrepreneurial mindset.
- Entrepreneurial motivations: how to decide to become an entrepreneur.
- Entrepreneurial behaviors.
- Risk-taking in entrepreneurial decision-making.
- Risk, uncertainty, and stakeholder involvement.

Module 3: Industry Understanding

- Introduction to industry understanding.
- Knowledge conditions, demand conditions.
- Industry lifecycle and industry structure.
- Competitive advantage and learning curve.

- Complementary assets, reputation effects.
- Product-market fit.

Module 4: Customer Understanding and Business Modeling

- Introduction to customer understanding.
- Macro changes that increase new venture opportunities.
- Government and entrepreneurs: collaboration opportunities.
- Importance of skills training and development for entrepreneurs and government.
- Exploring and satisfying real market needs.
- Strategic positioning and strategic planning.
- Value innovation and opportunity identification.

Module 5: Early Stage Investment Landscape

- New venture finance and investment landscape.
- Information venture capitalists look for in a good plan.
- Financial statements required by investors.
- Developing a balance sheet.
- Content of an income statement.
- Purpose of the cash flow statement.

Module 6: Sources of Capital for the Early Stage Company

- Sources of capital and where to find investors.
- Friends and family as investors.
- Bootstrapping.
- Role of incubators and accelerators.
- Angel investors.

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	Bloom's Level	Remarks
M1	Introduction to Innovation and Entrepreneurship	12	20	1, 2, 3	
M2	Entrepreneurial Mindset, Motivations, and Behaviors	10	20	1, 2	
M3	Industry Understanding	10	15	1, 2	
M4	Customer Understanding and Business Modeling	12	20	1, 2, 3	
M5	Early Stage Investment Landscape	10	15	1, 2	
M6	Sources of Capital for the Early Stage Company	6	10	1, 2	
Total		**60**	**100**		

Suggested Readings:

1. Entrepreneurship, Innovations & Start-Ups in India – Dr. Savita Joshi, New Century Publications.
2. Developing Thinking Skills (The Way to Success) – E. Balagurusamy, Khanna Publications.
3. A Practical Guide to Entrepreneurship: Be Your Own *Boss* – Alison Price and David Price.
4. Innovision – Chelat Bhuvanachandran, Khanna Book Publishing.
5. Fundamentals of Entrepreneurship – Dr. G.K. Varshney.
6. Fundamentals of Entrepreneurship – N.K. Jain.
7. Management and Entrepreneurship – Havinal Veerabhadrappa, New Age International (P) Ltd.
8. Entrepreneurship: Theory and Practice – Raj Shankar, McGraw Hill Education.
9. Entrepreneurship: Development and Management – Dr. Vasant Desai and Dr. Kulveen Kaur, Himalaya Publishing.
10. Entrepreneurship Development & Management – Dr. R.K. Singal.
11. Fundamentals of Entrepreneurship – Dr. A.N. Bharti, Dr. Vishwjeet Singh, Sanjay Gupta, Dr. Pramod Kumar.
12. Entrepreneurship: Text and Cases – P. Narayana Reddy, Cengage Learning.

(G43B-09): HANDLING HUMAN RESOURCES IN WORKPLACES

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives

1. Explore the fundamental concepts of Human Resource Management (HRM).
2. Enable learners to apply knowledge of recruitment and selection processes.
3. Develop understanding of performance appraisal systems.
4. Enhance skills in designing and evaluating training programs.
5. Provide insights into compensation management practices.
6. Analyze the effect of HRM practices on personal and professional development.

Course Outcomes (CO):

Sl	Course Outcome (CO)	Mapped Modules
CO1	Explaining the concept of Human Resource, functions, history, and scope	M1
CO2	Understanding the processes of Recruitment and Selection	M2
CO3	Explaining the concepts of Training and Performance Appraisal	M3
CO4	Explaining the concepts of Wage, Salary, and Attrition	M4
CO5	Understanding new policies of Human Resource Management	M5
CO6	Analyzing HRD in Public, Private, and MNC organizations	M6

Detailed Syllabus:

Module 1: Introduction to HRM

- Definition of HRM
- Objectives of HRM
- Theories of HRM
- Functions of HRM
- Role of the HR Manager
- Scope of HRM

Module 2: Recruitment and Selection

- Definition of recruitment
- Sources of recruitment
- Recruitment techniques used in different industries
- Definition of selection
- Selection methods
- Techniques of selection used in Government sectors

Module 3: Training and Performance Appraisal

- Concept of training and development
- Techniques of training used in IT, Government, and MNCs
- Concept of appraisal

- Modern techniques of appraisal (BARS, 360° Appraisal, HRA, etc.)
- Case study on the use of modern appraisal techniques in industries

Module 4 :Wage, Salary, and Attrition

- Concept of wage and salary
- Calculation of salary
- Concept of DA, DP, and fringe benefits
- Concept of leave structure
- Wage and salary administration process
- Concept of PF, Bonus, and Pension
- Concept of attrition

Module 5: Emerging HRM Policies

- New HRM policies in line with emerging trends
- Case study and term paper

Module 6: Practical HRD

- HRD in Public, Private, and MNC sectors
- Term paper presentation

Module Wise Marks Distribution:

Module	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks (If any)
Module 1	Explaining the concept of Human Resource, functions, history, and scope	6	15	2	
Module 2	Understanding Recruitment and Selection	9	20	2	
Module 3	Explaining the concept of Training and Performance Appraisal	8	20	2	
Module 4	Explaining the concept of Wage, Salary, and Attrition	10	15	2	
Module 5	Understanding new policies of Human Resource Management	12	15	2	
Module 6	HRD in Public, Private, and MNCs	15	15	1, 2	
Total		**60**	**100**		

Suggested Readings:

1. Human Resource Management – Gary Dessler
2. Human Resource Management – P. Subba Rao
3. Human Resource Management – Milkovich

(G43B-10): SOCIAL MEDIA MANAGEMENT & ADVERTISING & MARKETING

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective:

- Capitalize on the growing popularity of social media platforms.
- Create and oversee engagement strategies.
- Build and strengthen branding efforts.
- Plan and execute effective marketing campaigns.

Course Outcomes (CO):

Sl	Course Outcome	Mapped Modules
1	Understand Social Media	M1
2	Understand Audience	M2
3	Understand Content	M3
4	Understand Content Management	M3, M4
5	Evaluation of Study	M5
6	Understanding Social Media Advertising	M6
7	Effects of Ads in Social Media	M6, M7
8	Privacy Policy for Ads in Social Media	M8
9	Concept of Marketing in Social Media	M9
10	Branding	M10

Detailed Syllabus:

Module 1: Social Media: Concept

- What is social media?
- Social media management (definition).
- Digital marketing: concept, scope, and limitations.

Module 2: Audience

- Definition and nature of audience.
- Understanding social media pages.
- Choice of social media platforms.

Module 3: Content Creation

- What is content in social media?
- Impact, role, and influence of content.
- Judging the impact of posts across various social media platforms.
- Anatomy and structure of posts.
- Role of different types of posts in social media.
- Nature of posts: text, audio, audio-visual, and visual.

Module 4: Content Management

- Concept and application of content management.
- How to create content (introduction, body, overview).
- Planning a storyboard.
- Judging the quality of content.
- Creating deadlines for content (time management).
- Scheduling and auditing content.
- Social media content management practices.

Module 5: Project

- Assessing content across various social media platforms (e.g., Facebook, Instagram).

Module 6: Social Media Advertising

- Fundamentals of advertising in social media.
- Overview and concept of ads in social media.
- Paid ads in social media.
- Anatomy of advertisements in social media platforms.

Module 7: Advertisement in Social Media

- Identifying the nature of ads in social media.
- Creating effective ads.
- Writing copy for ads.
- Working with a brief.

Module 8: Ad Policies and Data Protection

- What is data in social media?
- Policies of social media platforms.
- Norms of placing ads in social media.
- Privacy policy and data protection.
- Government regulations relating to data.
- Self-regulation and company data policies.

Module 9: Posting Ads in Social Media

- Anatomy of various ads in Facebook and Instagram.

Module 10: Branding

- Brand existence.
- Brand purpose and identity.
- Building connections through branding.

Module 11: Capstone Project

- Comprehensive project integrating course learning.

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	Bloom's Level	Remarks (if any)
1	Social Media: Concept	10	5	1	
2	Audience: Definition and Nature	4.5	5	2	
3	Content Creation	4.5	10	3	
4	Content Management: Concept and Application	6	10	2,3	
5	Project on Assignment-1 & Assignment-2	6	10	3	
6	Social Media Advertising	4.5	5	2	
7	Ad in Social Media	5	10	2	
8	How to Put Ad in Social Media	4.5	10	3	
9	Marketing in Social Media	4.5	10	3	
10	Branding in Social Media	4.5	10	3	
11	Capstone Project	6	15	3	
Total		**54**	**100**		

Suggested Readings:

1. Content Writing – Joseph Robinson
2. Writing for the Web – Lynda Felder
3. Handbook of Social Media Management: Value, Chain and Business Models in Changing Media Markets – Mike Friedrichsen, Wolfgang Mühl-Benninghaus
4. Strategic Social Media Management: Theory and Practice – Karen E. Sutherland
5. Social Media Marketing – Tracy L. Tuten, Michael R. Solomon
6. The New Community Rules: Marketing on the Social Web – Tamar Weinberg

(G4B-11): E- COMMERCE & M- COMMERCE

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To understand the basic concepts and technologies used in E-commerce and M-commerce.
2. To develop knowledge about challenges and security issues from a business perspective in the E-commerce and M-commerce domain.
3. To familiarize students with HTML and CSS.

Course Outcomes (COs):

Sl.	Course Outcome	Mapped Modules
1	Remembering	M1, M2, M3, M4, M5, M6, M7
2	Understanding the course	M1, M2, M3, M4, M5, M6, M7
3	Applying the general problem	M3, M4, M6
4	Analyse the problems	M3, M4, M6
5	Evaluate the problems after analysing	M1, M2, M3, M4, M5, M6, M7
6	Create using the evaluation process	M7

Detailed Syllabus:

Module 1: E-Business Framework [5L]

- Definition of E-Business
- Origin of E-Business
- History of the Internet
- E-Business Opportunities for Businesses
- Working of E-Business
- E-Business vs. Traditional Business Mechanism
- Advantages and Disadvantages of E-Business
- Main Goals of E-Business

Module 2: Network Infrastructure for E-Commerce – I [5L]

- Local Area Network (LAN)
- Ethernet: IEEE 802.3: Local Area Network Protocols
- Wide Area Network (WAN)
- The Internet
- TCP/IP Reference Model
- Domain Names
- HyperText Markup Language (HTML)
- Simple Exercises in HTML

Module 3: E-Business – Requirements and Architecture [5L]

- Requirements of E-Business
- Functions of E-Business
- E-Business Framework Architecture
- I-way or Information Highway
- Business Models: Evolution of Internet Business Models, Business Models in Practice

- Six Components of Business Models

Module 4: Security in Electronic Business **[5L]**

- Intranet and Extranet Security: Threats and Protection
- Protection Methods
- Data and Message Security
- Firewalls
- Encryption and Cryptography
- Digital Signature
- Virtual Private Network (VPN)

Module 5: E-Marketing **[5L]**

- Challenges of Traditional Marketing
- Retailing in E-Business Space
- Internet Marketing
- Advertisement and Display on the Internet
- E-Business for Service Industry
- EDI (Electronic Data Interchange)
- E-CRM (Customer Relationship Management)
- E-SCM (Supply Chain Management)

Module 6: Mobile Commerce **[5L]**

- Overview of M-Commerce
- Wireless Application Protocol (WAP)
- Generations of Mobile Wireless Technology
- Components of Mobile Commerce
- Networking Standards for Mobiles

Module 7: HTML **[7L]**

- Creating web pages using HTML tags and elements
- Basic and advanced text formatting
- Multimedia components
- Designing web pages and document layout
- Lists, Tables, Hyperlinks
- Working with frames, forms, and controls

Module 8: Introduction to Cascading Style Sheets (CSS) **[8L]**

- Concept of CSS and Creating Style Sheets
- CSS Properties and Styling (Background, Text Format, Controlling Fonts)
- Working with Block Elements and Objects
- Working with Lists and Tables
- CSS Id and Class
- Box Model: Introduction, Border, Padding, and Margin Properties
- Advanced CSS: Grouping, Dimension, Display, Positioning, Floating, Alignment, Pseudo Classes
- Navigation Bar and Image Sprites
- Attribute Selectors
- CSS Colors
- Creating Page Layout and Site Designs

Suggested Readings:

1. Joseph, P.T. (2005). E-Commerce: An Indian Perspective (2e), New Delhi: Prentice-Hall of India.
2. Gupta (2021). E-Commerce, Second Edition, Khanna Book Publishing Company.
3. Gupta (2020). Information Security & Cyber Laws | AICTE Recommended, Khanna Book Publishing.
4. Kaspersky (2008). The Cybercrime Ecosystem Whitepaper, Kaspersky Lab.
5. O'Brien, J. (2004). Management Information Systems: Managing Information Technology in the Business Enterprise, New Delhi: Tata McGraw-Hill.
6. Rayport, J.F. & Jaworski, B.J. (2002). Introduction to E-Commerce, New York: McGraw-Hill Irwin.
7. Stair, R.M. & Reynolds, G.W. (2001). Principles of Information Systems (5e), Singapore: Thomson Learning.
8. Debtoru Chatterjee. Cyber Crime and Its Prevention in Easy Steps, Khanna Book Publishing Company.
9. Powell, Thomas. HTML & CSS: The Complete Reference, McGraw Hill Education India.
10. Elisabeth Robson & Eric Freeman. Head First HTML and CSS, Packt.

(G4B-12): E- DIGITAL TRANSFORMATION AND INDUSTRY 4.0

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To understand all the elements of transformation efforts.
2. To make students aware of the current situation in various industry verticals.

Course Outcomes (CO):

CO No.	Course Outcome
CO1	To offer students an introduction to Industry 4.0 (or the Industrial Internet) and its applications in the business world.
CO2	To understand the drivers and enablers of Industry 4.0.
CO3	To understand the opportunities and challenges brought about by Industry 4.0 and how organizations and individuals should prepare to reap the benefits.
CO4	To understand concepts of digital transformation and its application.

Detailed Syllabus:

Chapter 1: Introduction to Industry 4.0 **[8L]**

- The Various Industrial Revolutions
- Digitalization and the Networked Economy
- Drivers, Enablers, Compelling Forces, and Challenges for Industry 4.0
- The Journey So Far: Developments in USA, Europe, China, and Other Countries
- Comparison of Industry 4.0 Factory and Today's Factory
- Trends of Industrial Big Data and Predictive Analytics for Smart Business Transformation

Chapter 2: Road to Industry 4.0 **[6L]**

- Internet of Things (IoT) & Industrial Internet of Things (IIoT) & Internet of Services
- Smart Manufacturing
- Smart Devices and Products
- Smart Logistics
- Smart Cities
- Predictive Analytics

Chapter 3: Related Disciplines, Systems, and Technologies for Enabling Industry 4.0 **[6L]**

- Cyber-Physical Systems
- Robotic Automation and Collaborative Robots
- Support Systems for Industry 4.0
- Mobile Computing
- Related Disciplines
- Cyber Security

Chapter 4: Role of Data, Information, Knowledge, and Collaboration in Future Organizations [6L]

- Resource-Based View of a Firm
- Data as a New Resource for Organizations
- Harnessing and Sharing Knowledge in Organizations
- Cloud Computing Basics
- Cloud Computing and Industry 4.0

Chapter 5: Business Issues in Industry 4.0 [5L]

- Opportunities and Challenges
- Future of Work and Skills for Workers in the Industry 4.0 Era
- Strategies for Competing in an Industry 4.0 World

Chapter 6: Digital Transformation [7L]

- Introduction to Digital Transformation
- Digital Business Transformation
- Causes of Disruption and Transformation
- Digital Transformation Myths and Realities
- Digital Transformation and Customer Experience
- Four Pillars in Customer Experience Transformation
- Digital Transformation in Marketing

Chapter 7: Digital Transformation Across Various Industries [7L]

- Retail Industry
- Government and the Public Sector
- Insurance Industry
- Healthcare
- Banking: Royal Bank of Scotland Case Study
- Fintech: Travelex Case Study
- Public Sector: The MET Office Case Study

Chapter Wise Marks Distribution:

Chapter	Name of the Topic	Hours	Marks
01	Introduction to Industry 4.0	8	10
02	Road to Industry 4.0	6	10
03	Related Disciplines, Systems, and Technologies for Enabling Industry 4.0	6	10
04	Role of Data, Information, Knowledge, and Collaboration in Future Organizations	6	10
05	Business Issues in Industry 4.0	5	10
06	Digital Transformation	7	10
07	Digital Transformation Across Various Industries	7	10
Total		**45**	**70**

Suggested Books:

1. Alp Ustundag and Emre Cevikcan – Industry 4.0: Managing the Digital Transformation, Springer.
2. T.G. Sitharam – Building Future Ready India, Khanna Publishing.

Reference Books:

1. Dominik T. Matt, Vladimir Modrak, Helmut Zsifkovits – Industry 4.0 for SMEs: Challenges, Opportunities and Requirements, Springer.

(G5B-01): STUDY OF TEXTILES

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To provide working knowledge of textiles.
2. To ensure the best utilization of available fabric resources.
3. To create awareness of textile properties and their suitability for particular uses.
4. To enable students to understand and apply acquired knowledge in their designs.
5. To enhance the aesthetic and functional value of textile materials for the fashion industry.

Course Outcomes (CO):

Sl. No.	Course Outcome (CO)	Mapped Modules
1	Remember & understand different types of textile materials available in the market and their uses.	M1, M2
2	Understand various kinds of fabrics, their structure, properties, and utility.	M2
3	Understand textile dyeing, printing, and finishing techniques.	M3, M4
4	Apply dyeing & printing techniques on fabric samples to add aesthetic value.	M4, M6
5	Remember & understand various traditional hand embroidery techniques of India, and apply them for surface ornamentation of fabric samples.	M5
6	Apply different embellishment techniques on various samples for value addition.	M6

Detailed Syllabus

Module 1: **[4L]**

Introduction to Textiles and Classification of Fibres

- Classification according to source – Natural and Manmade.
- Identification and properties of textile fibres: Cotton, Silk, Wool, Linen, Rayon (regenerated), Acetate, Polyester, Nylon, and Acrylic.

Module 2: **[10L]**

Yarn and Fabric Construction

- **Process of Yarn Formation:** Hand spinning, mechanical (ring spinning), and modern (open-end spinning).
- **Yarn Classification:** Simple and novelty yarns; characteristics, properties, and uses of different yarns.
- **Fabric Construction Methods:**

  i. Weaving: Basic weaves (plain, satin, twill) and their variations.
  ii. Fancy weaves – pile, dobby, jacquard, extra warp and weft figure, leno, crepe, and double cloth.
  iii. Other methods – knitting, braiding, lace, felt.
  iv. Non-woven fabrics and their applications.

Module 3: **[5 L]**

Fabric Finishing Techniques

- **General Finishes:** Definition, importance to consumers, and classification (durability and function).
- **Mechanical and Chemical Processes:** Singeing, scouring, bleaching, mercerization, calendaring, sizing, de-sizing, brushing, carbonizing, crabbing, fulling, heat setting, shearing, weighting, stentering, napping.
- **Special Finishes and Treatments:** Water repellent, waterproof, antistatic, anti-slip, flame retardant, crease-resistant, durable press, shrink-resistant finishes.

Module 4: **[6L]**

Dyeing and Printing

- **Stages of Dyeing:** Fibre stage, yarn dyeing, fabric, cross, union dyeing, and product stage.
- **Methods of Dyeing:** Batch dyeing, reel dyeing, jig dyeing, and package dyeing.
- **Printing Methods:** Direct roller printing, block printing, duplex printing, discharge printing, screen printing (flat and rotary), resist printing, batik, and tie-dye.

Module V: **[Practical – 10L]**

Embroidery

- **Embroidery Tools and Techniques:** Needles, threads (classification), cloth selection, tracing, ironing, and finishing.
- **Basic Hand Embroidery Stitches:** Running stitch (basic + 2 variations), backstitch, stem stitch, chain stitch, lazy daisy stitch, buttonhole stitch, feather stitch, herringbone stitch, knot stitch, satin stitch, and cross stitch.
- **Traditional Embroidery of India:** Origin, application, and colours – Kantha, Chikan, Kasuti, Zardosi (4 variations), Kutch, and Mirror work (2 variations).

Module VI: **[Practical – 10L]**

Surface Embellishment

- **Printing & Painting Techniques:** Origin and applications – Block printing, Kalamkari, Patachitra.
- **Dyeing & Weaving Techniques:** Ikat, Patola, Bandhani, Leheriya, Shibori, Brocade weaving, Carpet weaving.
- **Special Embellishment Techniques:**

i. **Batik:** Splash, t-janting, crackled.
ii. **Tie and Dye:** Leheriya, Bandhani, Shibori, Sunray, Marbling.
iii. **Block Printing:** Vegetable and wooden blocks.
iv. **Appliqué:** Two methods.
v. **Quilting:** Two methods.
vi. **Smocking:** Chinese smocking (2 methods), honeycomb, gathered with embroidery.
vii. **Fabric Painting:** Four methods – hand, stencil, dabbing, spraying.

Module Wise Marks Distribution:

Module	Content	Total Hours	% age of questions	Covered CO	Blooms Level	Remarks (Ifany)
Module1	FiberClassification	4	12	1	1,2	
Module2	Yarn&FabricFormation	10	20	1	1,2	
Module3	FabricFinishing	5	20	2,3	1,2	
Module4	Dyeing&Printing	6	20	3,4	2,3	
Module5	Embroidery(Practical)	10	16	5	2,3	
Module6	Surface Embellishment (Practical)	10	12	4,6	2,3	
		45	100			

Suggested Readings

1. Corbman, B.T., Fiber to Fabric, McGraw Hill.
2. Gale, E., From Fiber to Fabrics, Allman & Sons Ltd.
3. Wingate, Fiber Science and Their Selection, Prentice Hall.
4. Editors of American Fabric Magazine, Encyclopedia of Textiles.
5. Hollen, N., Textiles, Macmillan Publishing Company.
6. Murphy, W.S., Textile Finishing, Abhishek Publications, Chandigarh.
7. Merchant, Indian Tie-Dyed Fabrics, Volume IV of Historic Textiles of India, Celunion Shop.
8. Gillow, John & Barnard, Nicholas, Traditional Indian Textiles, Thames & Hudson.
9. Proctor, Richard M. & Lew, Jennifer F., Surface Design for Fabric, University of Washington Press.
10. Synge, Lanto, Art of Embroidery: History of Style and Technique, Woodridge.
11. Helen, M., The Timeless Embroidery, David & Charles.
12. Reader's Digest: Complete Guide to Sewing, *1*993, Pleasantville.
13. Barbara, S., Creative Art of Embroidery, Numbly Pub. Group Ltd., London.
14. Shailaja, N., Traditional Embroideries of India, APH Publishing, Mumbai.
15. Purushothama, B., Quality Management in Garment Industry.

(G5B-02): INTRODUCTION TO HOSPITALITY INDUSTRY AND MAJOR DEPARTMENTS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

- To provide students with an overall concept of hotel operations.
- To familiarize learners with the major operating departments of a hotel.
- To understand the hierarchy, job profiling, and key functions within hotel operations.
- To analyze the interrelationships and coordination among different hotel departments.

Course Outcomes (CO):

Sl	Course Outcome	Mapped Modules
1	Understand the hospitality industry and its relationship with tourism.	M1, M2
2	Understand basic front office operations.	M1, M2
3	Understand basic housekeeping operations.	M2, M3
4	Understand the importance of safety and hygiene.	M2, M3, M4
5	Understand the basic Food & Beverage (F&B) service operations.	M1, M5
6	Understand and demonstrate menu knowledge and different types of service.	M5, M6

Detailed Syllabus:

Module 1 – Introduction to Hospitality Industry **[5L]**

- Characteristics of Hospitality Industry and its relationship with Tourism
- Types and Classification of Hotels
- Departments in Hotels: Front Office, Housekeeping, F&B Service, and non-revenue earning departments
- Coordination among departments

Module 2 – Basic Front Office Operations **[8L]**

- Organizational chart of Front Office department, duties and responsibilities of staff
- Types of guest rooms, basis of charging tariff, meal plans, types of guests
- Responsibility of Front Office department
- Procedures: Pre-registration, registration procedures, bell-desk, concierge, cashier, night audit
- Role-play: Check-in and check-out procedures
- Sanitization procedures

Module 3 – Basic Housekeeping Operations **[9L]**

- Organizational chart of Housekeeping department, duties and responsibilities of staff
- Responsibility of Housekeeping department
- Layout of guest room, guest supplies and amenities, floor and pantry
- Room cleaning procedures, key control, lost and found procedures
- Forms, formats, and registers in Housekeeping
- Functions of Housekeeping control desk
- Role-play: Complaint handling and various guest services

Module 4 – Safety and Hygiene **[5L]**

- Importance of Safety and Hygiene
- Sanitization techniques for guests, hotel personnel, offices, guestrooms, and public areas
- Liaison with public health department
- Accidents, fire, and security protocols
- Concept of First Aid and artificial respiration

Module 5 – Basic F&B Service Operations **[9L]**

- Organizational chart of F&B Service department, duties and responsibilities of staff
- Responsibility of F&B Service department
- Attributes of F&B personnel
- Equipment and service ware: use, care, and maintenance
- Types and layout of F&B Service areas
- Basic menu knowledge and types of service

Module 6 – Menu and Types of Service **[9L]**

- Basic concept of Menu
- Restaurant and Coffee Shop layout
- The concept of stations, numbering tables, and covers at a table
- Reservation systems in restaurants
- Records & registers maintained by restaurants
- Rules for laying and waiting at the table
- Dos & don'ts of waiting staff in F&B service operations
- Organizing staff for service

Module Wise Marks Distribution:

Module Number	Content	Total Hours	%age of Questions	Bloom's Level (if applicable)	Remarks (If any)
M1	Introduction to Hospitality	05	10	1,2	
M2	Basic Front Office Operation	08	15	2,3	
M3	Basic Housekeeping Operation	09	15	2,3	
M4	Safety and Hygiene	05	20	2,3	
M5	Basic F&B Service Operations	09	20	3,4	
M6	Menu and Types of Service	09	20	3,4	
	Total	**45**	**100**		

Suggested Readings:

1. Development of Hotels and Resorts – S.G. Krishna Murthy, Khanna Publications
2. Hotel Housekeeping – Sudhir Andrews, Tata McGraw Hill
3. The Professional Housekeeper – Tucker Schneider, VNR

4. Professional Management of Housekeeping Operations – Martin Jones, Wiley
5. Housekeeping Management for Hotels – Rosemary Hurst, Heinemann
6. Front Office Operations – Colin Dix & Chris Baird
7. Hotel Front Office Management – James Bardi
8. Managing Front Office Operations – Kasavana & Brooks
9. Food & Beverage Service – Lillicrap & Cousins
10. Modern Restaurant Service – John Fuller
11. Food & Beverage Service Management – Brian Varghese
12. Introduction to F&B Service – Brown, Heppner & Deegan
13. Professional Food & Beverage Service Management – Brian Varghese

(G5B-03): HEALTH EDUCATION AND COMMUNICATION

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To provide students with fundamental knowledge of health and health communication.
2. To enable students to apply information, communication, and education (IEC) strategies across different media platforms.
3. To promote equitable access to health information for both prevention and cure.

Course Outcomes (CO):

Sl	Course Outcome	Mapped Modules
CO1	Explain the concept of health and the knowledge of health education in society	M1
CO2	Apply modern technology in healthcare sectors	M2
CO3	Describe the different models of communication	M3
CO4	Develop communications for different fields of society	M4
CO5	Use the computer as a tool in healthcare	M5
CO6	Understand how to create awareness among people about health	M6

Detailed Syllabus:

Module 1 – Concept of Health and Health Education (8 Hours)

- Definition of physical health, mental health, social health, spiritual health.
- Determinants of health, indicators of health.
- Concept of disease, natural history of diseases, disease agents, concept of prevention of diseases.
- **Health Education:** Principles & Objectives, Levels of Health Education, Educational Methods, Evaluation & practice of Health Education in India.
- **Family Planning:** Demography and family planning: Demography cycle, fertility, family planning, contraceptive methods (behavioral, natural family planning, chemical, mechanical, hormonal), population problem of India.

Module 2 – Health Education & Artificial Intelligence (6 Hours)

- Changes in the workforce with AI.
- Robots assisting human experts or fully robotic diagnosis.
- Medical training: role of AI in training paramedical students.
- Virtual health assistants.
- Advanced health research.
- Clinical and administrative task handling.

Module 3 – Health Communication (8 Hours)

- Basic concept & principles of communication.
- Definition, purpose, and types of communication.
- Communication process and directions (upward, downward, lateral).
- Factors influencing communication and barriers to effective communication.
- Overcoming barriers to communication.

- **Models of Communication:** Aristotle Model, Shannon and Weaver Model, Schramm Model, Laegans Model, Fano Model, Literer's Model, Westley & MacLean's Model.

Module 4 – Mass Communication and Role of Media (8 Hours)

- Mass communication & its role in health education.
- ICT in health care and awareness: Telemedicine & e-health, community radio.
- Future trends in information and communication systems.

Module 5 – Tools Used for Communication (7 Hours)

- Introduction to PC operating systems: Windows 10 / Ubuntu.
- MS Office 2016 / Office 360: MS Word, MS Excel, MS PowerPoint, MS Outlook.
- Internet and Email usage in healthcare communication.

Module 6 – Presentation on Concept of Health and Health Education (8 Hours)

- Student presentations and demonstrations on selected topics from health and health education.

Module Wise Marks Distribution:

Module Number	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks (If any)
M1	Concept of Health and Health Education	8	20	L1, L2	
M2	Health Education & Artificial Intelligence	6	10	L1, L2	
M3	Health Communication	8	10	L1, L2	
M4	Mass Communication and Role of Media	8	10	L1, L2	
M5	Tools Used for Communication	7	30	L1, L2	LAB
M6	Presentation on Concept of Health & Health Education	8	20	L1, L2	LAB
Total		**45**	**100**		

Reference Books

1. Health Education – A New Approach – L. Ramachandran & T. Dharmalingan.
2. Health Communication in the 21st Century – Kevin B. Wright, Lisa Sparks, H. Dan O'Hair, Blackwell Publishing Limited, 2013.
3. Health Communication: From Theory to Practice – Renata Schiavo, Jossey-Bass.
4. Health Communication – R. D. Karma, Mohit Publications, 2008.
5. Counseling Skills for Health Care Professionals (1st Edition) – Rajinikanth A. M., Jaypee Brothers, 2008.

(G5B-04): HOSPITAL SUPPORT SERVICES

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

- To gain an overview of the general concepts of a hospital.
- To demonstrate the concept of outpatient services.
- To demonstrate the concept of inpatient services.
- To demonstrate the concept of specialty services.
- To demonstrate the concept of superspecialty services.
- To demonstrate the concept of support services.
- To demonstrate the concept of utility services.

Course Outcome (CO):

Sl. No.	Course Outcome	Mapped Modules
1	Ability to demonstrate the concept of a hospital	Module I
2	Ability to demonstrate the concept of outpatient service	Module II
3	Ability to demonstrate the concept of inpatient service	Module III
4	Ability to demonstrate the concept of specialty service	Module IV
5	Ability to demonstrate the concept of superspecialty service	Module V
6	Ability to demonstrate the concept of support service	Module VI
7	Ability to demonstrate the concept of utility service	Module VII

Detailed Syllabus:

I – Overview: General Concepts of Hospital (6L)

- Disaster management
- Hospital operations management: role and decisions
- Difference of hospital operations from other service and manufacturing organizations

Module II – Outpatient Services (6L)

- Overview of the department
- Day care
- Accident and emergency services
- Physical medicine and rehabilitation
- Occupational therapy unit
- Physiotherapy department

Module III – Inpatient Services (5L)

- Nursing service and ward management
- Critical care services – ICU, CCU, NICU
- Medical services, surgical services
- Operation theater
- Nuclear medicine, burn unit
- Nursing services and administration

Module IV – Specialty Services (6L)

- Pediatrics
- OBG & GYN
- ENT
- Ophthalmology
- Orthopedic
- Psychiatry
- Anesthesia
- Dental

Module V – Super-Specialty Services (6L)

- Cardiology
- Thoracic surgery
- Neurology
- Neurosurgery
- Nephrology – Dialysis Unit
- Transplantation services

Module VI – Support Services (8L)

- Diagnostic – Radiology & Imaging Services
- Hospital Laboratory
- Blood Bank & Transfusion Services
- Ambulance Services
- Pharmacy
- CSSD
- Oxygen Manifold/Concentrator
- Dietary Service
- Hospital Laundry and Linen
- Medical Social Worker
- Marketing and Public Relations
- Finance and Administrative Departments
- Outsourcing

Module VII – Utility Services (8L)

- Housekeeping
- Hospital Engineering and Maintenance
- Biomedical Department
- Central Stores and Purchase Department
- Medical Records – confidentiality of records
- Reception, enquiry, registration and admission
- Central billing and accounts
- Cafeteria/canteen
- Mortuary

Module Wise Marks Distribution:

Module No.	Content	Total Hours	%age of Questions	Covered CO	Covered PO	Blooms Level (if applicable)	Remarks (if any)
MODULE I	General Concepts	6	15	1	7	L1, L2	
MODULE II	Inpatient Services	6	10	2	7	L2, L3	
MODULE III	Outpatient Services	5	10	3	7	L2, L3	
MODULE IV	Specialty Services	6	10	4	7	L2, L3	
MODULE V	Super-Specialty Services	6	10	5	7	L2, L3	
MODULE VI	Support Services	8	20	6	7	L2, L3	
MODULE VII	Utility Services	8	25	7	7	L2, L3	
Total		**45**	**100**				

Suggested Readings:

1. Hospital Facilities Planning & Management – G.D. Kunders, TMH
2. Principles of Hospital Administration & Planning – B.M. Shakharkar, Jaypee
3. Hospital Administration – D.C. Joshi & Mamta Joshi, Jaypee
4. Essentials for Hospital Support Services and Physical Infrastructure – Madhuri Sharma, Jaypee
5. Hospitals and Nursing Homes Planning, Organizations and Management – Syed Amin Tabish, Jaypee

(G5B-05): BLOCKCHAIN TECHNOLOGY

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective:

- To appreciate the functionality of Blockchain technologies

Course Outcome (CO):

- To be able to apply blockchain in traditional business contexts

Detailed Syllabus:

Chapter No.	Name of the Topic	Sub-Topics	Hours	Marks
01	**Understanding the Technology**	• How it began and the blockchain landscape: size of the market, geographies, and major players.• Not one technology but many: key business protocols and how they work.• Design principles: security, privacy, preservation of rights.• Business application framework: challenges and solutions in integration and implementation.	9	15
02	**Applying Blockchain in Traditional Business Contexts**	• To disrupt or sustain: How is blockchain being applied to drive value for business across sectors, enterprises and business models?• When is blockchain the answer? Ideal use cases and criteria: blockchain vs. traditional distributed databases.• Action principles for managing blockchain for business value.• Creating an action plan for your business: initial thoughts and faculty input.	9	15
03	**Blockchain and Radical Business Innovation**	• How can blockchain services, platforms and infrastructures innovate distributed business models?• Analysis of case studies, including crypto-tokens, crowdfunded ICO startups, smart contracts, and ecosystem resource exchanges, to inform innovation in your business or work.	9	15
04	**Risks, Return and Regulation**	• The business case for a blockchain application: learn how to identify and manage risks, problems and challenges and how to assess likely business value.• Organisational implementation challenges and emerging solutions: build stakeholder buy-in and senior leadership support.• Reviewing shared governance models and understanding the regulatory environment.	9	15
05	**The Future of Blockchain – Developments,**	• Where is it all going? Expert analysis of emerging core uses and new areas.• What are the risks, challenges and solutions?• Action plan session:	9	10

	Directions and Challenges	Designing a blockchain solution and building a paper-prototype.		
	Sub-Total		**45**	**70**
	Internal Assessment + Preparation for Semester Examination			**30**
	Total		**45**	**100**

Text Books:

1. Anshul Kaushik, Block Chain & Crypto Currencies, Second Edition, AICTE Recommended, 2021, ISBN: 978-9386173720, Khanna Publishing House
2. Kartik Hegadekatti, Fundamentals of Blockchain Technology, 2021, ISBN: 978-9386173720, Khanna Publishing House
3. Tailor Jacobs, Blockchain: A Step-by-step Guide for Beginners to Implementing Blockchain Technology and Leveraging Blockchain Programming, 2017, ISBN: 978-1548009595, Createspace Independent Pub

Reference Book:

1. David Furlonger and Christophe Uzureau, The Real Business of Blockchain, 2019, ISBN: 978-1633698048, Harvard Business Review Press

(G5B-06): INTRODUCTION TO 3D PRINTING TECHNOLOGY

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. Introduce students to the basic concepts and principles of 3D printing technology.
2. Explore the materials used in 3D printing and the techniques to achieve optimal prints.

3. Explore the diverse applications of 3D printing across various industries and emerging innovations.
4. Apply knowledge gained to conceptualize, design, and print a project using 3D printing technology.

Course Outcome (CO):

Sl. No	Course Outcomes	Mapped Module/Unit
CO1	Students will demonstrate an understanding of the fundamental principles of additive manufacturing and the various processes involved, including FDM, SLA, and SLS. They will be able to explain how each process works, identify suitable applications for different technologies, and compare their strengths and limitations.	U1
CO2	Students will be able to apply design principles specific to additive manufacturing, such as designing for manufacturability, optimizing geometries to minimize supports, and ensuring structural integrity and dimensional accuracy. They will demonstrate proficiency in using CAD software to create models suitable for 3D printing.	U2
CO3	Students will analyze case studies and real-world applications of 3D printing technology across various industries, including automotive, aerospace, healthcare, and consumer goods. They will evaluate the impact of 3D printing on product development cycles, supply chain management, and customization capabilities within these sectors.	U3
CO4	Students will critically discuss ethical considerations related to 3D printing, such as intellectual property rights, privacy concerns in bioprinting, and the societal implications of widespread adoption. They will also examine sustainability aspects, comparing the environmental footprint of additive manufacturing with traditional manufacturing methods and exploring strategies for reducing waste and recycling materials.	U4

Detailed Syllabus:

Unit	Name of the Topic	Hours	Contents
Unit-I	Fundamentals of 3D Printing	15	Overview of Additive Manufacturing; Definition and principles of additive manufacturing; Historical development and key milestones in 3D printing technology; Types of 3D Printing Processes – classification and comparison of techniques (FDM, SLA, SLS), principles and industrial applications; Materials used in 3D Printing – polymers, metals, ceramics, properties and considerations for selection; CAD and Digital Modeling for 3D Printing – basics of CAD software, design considerations (supports, resolution).
Unit-II	Design Considerations and Optimization for 3D Printing	10	Design for Additive Manufacturing (DfAM) – principles, optimizing designs, geometric considerations (overhangs, supports, tolerances); Software Tools and Simulation – slicing software, simulation tools for predicting outcomes and optimizing designs; Quality Control and Inspection – evaluating print quality (surface finish, dimensional accuracy), post-processing techniques.
Unit-III	Applications and Industry Trends	10	Industrial Applications – case studies in automotive, aerospace, healthcare, consumer goods; impact on supply chain management, prototyping, and customization; Advanced Applications – bioprinting, medical applications, use in architecture, art, and fashion; Future Trends and Challenges – emerging materials and technologies, economic and regulatory considerations.

Unit-IV	Ethics, Sustainability, and Future Directions	10	Ethical Considerations – intellectual property issues, digital piracy, ethical implications of bioprinting and personalized medicine; Sustainability – environmental impact compared to traditional manufacturing, recycling and waste management; Future Directions – predictions for the future of 3D printing, challenges and opportunities in advancing additive manufacturing techniques.

Unit Wise Marks Distribution:

Unit	Total Hours	% of Questions	Bloom's Taxonomy	Remarks, if any
THEORY				
U1	**10**	**30**	**1,2**	
U2	**10**	**25**	**1,2**	
U3	**10**	**25**	**1,2,3**	
U4	**15**	**20**	**1,2,3**	
	45	**100%**		

List of Books:

1. **3D Printing & Design** – Sabrie Soloman
2. **3D Bioprinting Revolution** – Sabrie Soloman

(G5B-07): ADVANCES IN MEDICAL TECHNOLOGIES

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective:

- To provide students with a comprehensive understanding of various biochemical techniques.
- To focus on chromatographic, electrophoretic, and centrifugation techniques.
- To introduce the use of radioisotopes and immunoassays in biochemical analysis.
- To enable students to understand the principles behind these techniques.
- To familiarize students with the instrumentation used in these methods.
- To explain the clinical applications of these biochemical techniques.

Course Outcome (CO):

Sl. No.	Course Outcome	Mapped Module/Unit
CO1	Understand and explain the principles of chromatography.	U1
CO2	Discuss comprehensive electrophoretic techniques.	U2
CO3	Understand the fundamentals and principles of centrifugation and describe the instrumentation and applications in clinical diagnostics.	U3
CO4	Understand the principles and applications of radioisotopes in clinical biochemistry.	U4
CO5	Comprehend the principles of various immunoassays and their application in clinical diagnostic procedures.	U5
CO6	Understand basic concepts of DNA and protein sequencing and grasp the principles of next-generation sequencing, proteomics, and related applications.	U6

Detailed Syllabus:

Unit	Name of the Topic	Hours
Unit-I	Chromatography: Principle, types, and applications. Paper Chromatography, Thin Layer Chromatography (TLC), HPLC, Gas Liquid Chromatography, Ion Exchange Chromatography and their application in clinical diagnosis.	10
Unit-II	Basic Principles of Electrophoresis: Paper electrophoresis, Gel electrophoresis, PAGE, SDS-PAGE, Agarose gel electrophoresis, buffer systems. Electrophoresis of proteins and nucleic acids, hemoglobin. Applications in clinical diagnosis.	10
Unit-III	Centrifugation: Basic principles, Instrumentation of Ultracentrifuge (Preparative, Analytical), Factors affecting sedimentation velocity, Standard Sedimentation Coefficient, Rate-Zonal Centrifugation, Sedimentation Equilibrium Centrifugation.	10

Unit-IV	Radioisotopes: Radioactivity, instruments for radioactivity measurement, X-Ray Crystallography – X-ray diffraction, applications of radioisotopes in clinical biochemistry.	5
Unit-V	Immunoassay: ELISA, RIA, FIA, FACS, Western Blotting and their applications in clinical diagnosis.	5
Unit-VI	Introduction to DNA sequencing, protein sequencing, next-generation techniques, proteomics, MALDI-TOF applications in clinical diagnosis.	5
Total		**45**

Chapter Wise Marks Divison:

Unit	Total Hours	% of Questions	Bloom's Taxonomy	Remarks, if any
THEORY				
U1	10	20	1,2	
U2	10	20	1,2	
U3	10	20	1,2,3	
U4	5	15	1,2	
U5	5	15	1,2	
U6	5	10	1,2	
	45	100%		

Reference Books:

1. Fundamentals of Clinical Chemistry**,** 6th edition, Elsevier Publications – Teitz (2007)
2. Clinical Diagnosis and Management by Laboratory Methods, 22nd edition, Elsevier – Henry's (2011)
3. Practical Biochemistry**,** 2nd edition – Wilson & Walker
4. Principles of Biochemistry, 6th edition – Lehninger (2013

(G5B-08): FUNDEMENTALS OF IOT

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To understand the key concepts of IoT (Internet of Things).
2. To understand various concepts of sensors and actuators.
3. To understand various concepts of interfacing.
4. To understand various concepts of ESP8266.
5. To understand various concepts of IoT communication protocols.

Course Outcome (CO):

CO No	Course Outcome	Mapped Module/Unit
CO1	Students should grasp the fundamental concepts of the Internet of Things (IoT), including its definition, components, architecture, and applications.	U1
CO2	Gain knowledge of the technologies that underpin IoT systems, such as sensors, actuators, communication protocols (like MQTT, CoAP), and IoT platforms.	U2
CO3	Comprehend the ecosystem surrounding IoT, including cloud computing, edge computing, data analytics, and cybersecurity considerations specific to IoT.	U3
CO4	Acquire skills in designing and developing IoT systems, covering aspects like device integration, data management, and application development for IoT.	U4
CO5	Learn about deploying IoT solutions in real-world scenarios, managing IoT devices and networks, scalability considerations, and maintenance.	U5

Detailed Syllabus:

Unit	Name of the Topic	Hours
Unit-I	Introduction To IoT: • Understanding IoT fundamentals • IoT Architecture and protocols • Various Platforms for IoT • Realtime Examples of IoT • Overview of IoT components and IoT Communication Technologies • Challenges in IoT	9
Unit-II	Introduction To Arduino Programming: • ARDUINO Uno board Block diagram • Sketch Structure • Datatypes & Built-in Constants • Operators: Arithmetic, Bitwise, Compound, Comparison, and Boolean • Control statements and Loops • Functions and library functions • User defined functions • Library functions: I/O Functions: digitalRead, digitalWrite, pinMode, analogRead, analogWrite,	9

	analogReference. Char functions: isAlpha, isAlphaNumeric, isDigit, isHexadecimalDigit, isSpace, isWhitespace, isUpperCase, isLowerCase. Math Functions: abs, constrain, max, min, pow, sqrt • Serial Communication Functions: Serial, available, begin, end, print, println, write, read, readBytes, readString. • Chapter Ending Project: LED Blinking using Arduino (Using Virtual Simulation)	
Unit-III	Introduction To IoT Devices (Using Virtual Platform): • Overview of Sensors and Actuators • Introduction To Different Sensors (Working, PIN Diagram): Temperature and Humidity, PIR, Light, Ultrasonic Sensor • Introduction To Different Motors (Working, PIN Diagram): Interfacing of Servo, DC Motors • Interfacing of Actuators and Sensors with Arduino	9
Unit-IV	Introduction To ESP8266 Board (Using Virtual Platform): • Introduction Pin out • Interfacing of Servo, Ultrasonic Sensor, LDR Sensors	9
Unit-V	Different Protocols and Cloud Platform: Introduction To Protocols: • MQTT • CoAP • XMPP Introduction To Cloud: • Introduction To Cloud Computing • Introduction To SAAS, PAAS, IAAS • Introduction to Thingspeak	8
Unit-VI	Project: Home Automation (Virtual Mode)	1
Total		**45**

Chapter Wise Marks Distribution:

Unit	Total Hours	% of Questions	Bloom's Taxonomy	Remarks, if any
THEORY				
U1	9	20	1,2	NA
U2	9	20	1,2	NA
U3	9	20	1,2,3	NA
U4	9	20	1,2,3	NA
U5	8	20	1,2,3	NA
U6	1			
	45	100%		

List of Books:

1. Internet of Things | AICTE Recommended – Jeeva Jose, Khanna Publishing House
2. Internet of Things with Arduino Cookbook – Marco Schwartz, Packt Publishing Ltd.
3. Internet of Things: A Hands-On Approach – Arshdeep Bahga and Vijay Madisetti, Universities Press (India) Private Limited

G5B-09): BASICS OF PRESCRIPTION READING AND MEDICAL TRANSCRIPTION

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To familiarize students with medical terminology, including prefixes, suffixes, and abbreviations.
2. To provide foundational knowledge of anatomy and physiology relevant to medical transcription.
3. To train students in interpreting and preparing medical reports, including outpatient and inpatient reports.
4. To introduce students to medical instruments, surgical procedures, and related terminology.
5. To train students in essential computer skills for medical transcription, including data entry, text editing, and internet browsing.
6. To develop advanced transcription skills, including transcribing authentic physician dictations and complex medical documents.
7. To educate students on legal aspects and ethical considerations in medical transcription.

Course Outcomes (CO):

Course Outcomes (CO)	Description	Mapped Module/Unit
CO1	Students will be able to accurately identify and interpret medical terms, enhancing their ability to transcribe medical documents effectively.	U1
CO2	Students will gain a comprehensive understanding of anatomical structures and physiological processes, enabling them to transcribe medical reports with anatomical accuracy.	U2
CO3	Students will develop skills in accurately transcribing and interpreting medical findings and reports, enhancing their proficiency in medical transcription.	U3
CO4	Students will be proficient in transcribing surgical procedures, understanding surgical terminology, and accurately documenting operative reports.	U4
CO5	Students will acquire proficiency in using computer software and tools for efficient medical transcription, enhancing productivity and accuracy.	U5
CO6	Students will demonstrate mastery in transcribing various medical documents accurately, applying advanced transcription techniques and adhering to industry standards.	U6
CO7	Students will understand legal responsibilities, ethical standards, and confidentiality requirements in medical transcription practice, and demonstrate proficiency in English language skills necessary for accurate transcription and effective communication in medical settings.	U7

Detailed Syllabus:

Chapter	Name of the Topic	Hours
Unit-I	Medical words, Words Dynamics, Body Dynamics, Medical specialties & specialists, Medical Abbreviations, Prefixes, Suffixes, Surface Marking, Positional Orientation	5
Unit-II	Anatomy & Physiology-Basic Ideas: Skin, Respiratory System, Digestive System, Cardiovascular System & Angiology, Reproductive System & Sex related disorders, Urinary System, Nervous System, Certain common Medical Disorders, E.N.T., Ophthalmology, Dentistry, Musculo-skeletal System (Osteology, Mycology, Orthopaedics & Fractures), Endocrinology, Immunology & Genetics, Oncology, Psychiatry, Blood & Blood forming organs, Surgical procedures & operations, Instruments, Accessories, Splints, Prosthetics, Cosmetology, Tropical diseases outline, Pharmacology, Drug Terminology, Dosages & schedules, Terms, symbols, spelling, packaging, Classification (Brand, generic, and trade name)	10
Unit-III	Report types, Outpatient Reports, Inpatient Reports, Study, Interpretation & preparing report of various Pathological, Radiological findings, Investigations & nomenclatures, parameters used in Electrocardiology, Echocardiology, Pulmonology & Radiology	5
Unit-IV	Medical Instruments & equipment, Surgical Instruments, Suture and Dressings, Surgery-related terms listing, dictation, and sample reports. Surgical procedures & operations, Instruments, Accessories, Splints, Prosthetic	5
Unit-V	Computer: Practice on data entry & data processing and Text editing, Logging, Internet Browsing, Downloading – Text. Computer Basics: Computer Software, Input/Output Devices, MS Office - MS Word, Browsing, Surfing, E-mail	5
Unit-VI	Medical Transcription: Practice on transcribing authentic physician's dictation, including office chart notes in various formats, letters, initial office evaluations, history & physicals, consultations, operative reports and discharge summaries. Use, importance & application of Medical Transcription. New paradigm of medical treatment using computer, internet, website etc. Familiarization with AAMT Book of Style Guidelines. Beginning, Intermediate & Advanced Medical Transcription, Installing Wav Pedal – ExpressScribe, Installing dictation modules, procedures for transcribing, common errors of new transcriptionists, the healthcare team and the operative report, prepping and draping methods, surgical positions, types of anesthesia, wound and wound closures, dealing with difficult dictators, Expander software (Instant Text), Windows shortcuts and abbreviations, shortcut rules for words, phrases, and prefixes, procedures for transcribing advanced files	10
Unit-VII	Legal Aspects and Ethical Considerations for Transcriptionists, English Language for Medical Transcriptionists	5
Total		45

Chapter Wise Marks Distribution:

Unit	Total Hours	% of Questions	Bloom's Taxonomy	Remarks, if any
THEORY				
U1	5	10	1,2	NA
U2	10	20	1,2,3	NA
U3	5	10	1,2,	NA
U4	5	10	1,2,	NA
U5	5	20	1,2,	NA
U6	10	10	1,2	NA
U7	5	10	1,2	NA
		100		

List of Books:

1. Medical Transcription – Blanche Ettinger, Alice G. Ettinger
2. Essentials of Medical Transcription: A Modular Approach – Cynthia Destafano, Fran M. Federman

(G5B-10): FUNDAMENTAL OF BIOINFORMATICS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

- To provide a strong foundation in bioinformatics principles, tools, and techniques.
- To develop skills for analyzing large-scale molecular biology data using bioinformatics approaches.
- To teach students to effectively use biological databases for research and practical application.
- To familiarize students with key bioinformatics tools and software for data analysis and visualization.
- To prepare students to engage in bioinformatics research, including data generation, storage, retrieval, and analysis.

Course Outlook (CO):

Course Outcomes (CO)	Description	Mapped Module/Unit
CO1	Demonstrate a comprehensive understanding of bioinformatics and its relationship with molecular biology.	U1
CO2	Utilize key bioinformatics tools and software for sequence analysis and molecular biology.	U2
CO3	Efficiently navigate and extract relevant information from major biological databases, analyze large-scale molecular biology data, and interpret results using bioinformatics.	U3
CO4	Apply techniques for storing biological data, including flat files, relational databases, and project object-oriented databases.	U4
CO5	Understand how gene expression is regulated, how it varies among different stages, and compare mechanisms of gene expression.	U5
CO6	Understand how genetic differences contribute to variations in clinical outcomes and disease susceptibility.	U6

Detailed Syllabus:

Chapter	Name of the Topic	Hours
Unit-I	What is Bioinformatics and its relation with molecular biology; Examples of related tools (FASTA, BLAST, BLAT, RASMOL), databases (GENBANK, PubMed, PDB), and software (RASMOL, Ligand Explorer); Data generation; Generation of large-scale molecular biology data; Applications of Bioinformatics.	10

Unit-II	Biological Database and its Types; Introduction to data types and source; Population and sample; Classification and Presentation of Data; Quality of data; Private and public data sources.	10
Unit-III	General Introduction of Biological Databases; Nucleic acid databases (NCBI, DDBJ, and EMBL); Protein databases (Primary, Composite, and Secondary).	10
Unit-IV	Data storage and retrieval and Interoperability; Flat files, relational, object-oriented databases and controlled vocabularies; File Format (Genbank, DDBJ, FASTA, PDB, SwissProt).	5
Unit-V	Gene Expression and Representation of patterns and relationship; General introduction to Gene expression in prokaryotes and eukaryotes; Transcription factors binding sites.	5
Unit-VI	SNP, EST, STS; Introduction to Regular Expression, Hierarchies, and Graphical models (including Markov chain and Bayes nets); Genetic variability and connections to clinical data.	5
Total		**45**

Chapter Wise Marks Distribution:

Unit	Total Hours	% of Questions	Bloom's Taxonomy	Remarks, if any
THEORY				
U1	10	20	1,2	NA
U2	10	20	1,2,3	NA
U3	10	20	1,2,	NA
U4	5	15	1,2,	NA
U5	5	15	1,2,	NA
U6	5	10	1,2	NA
		100%		

List of Books (non-tabular format):

1. Bioinformatics – A Practical Guide to the Analysis of Genes and Proteins by Andreas Baxevanis & B.F. Francis Ouellette
2. Bioinformatics: Principles and Applications *by* Zhumur Ghosh and Bibekanand Mallick
3. Foundations of Bioinformatics by Manuj Darbari, Khanna Book Publishing

(G6B-01): INDIAN CONSTITUENCY

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Outcomes:

Sl. No.	Course Outcome	Mapped Modules
1	Understand the emergence and evolution of Indian Constitution	Module 1
2	Understand the structure and composition of Indian Constitution	Module 2, Module 3, Module 4
3	Understand the Election and role of Election Commission of India	Module 5

Detailed Syllabus:

Unit	Content	L/Unit
1	**Introduction:** 'Constitution' – meaning of the term, Indian Constitution: Sources and constitutional history, Features: Citizenship, Preamble, Fundamental Rights and Duties, Directive Principles of State Policy	7
2	**Union Government and its Administration:** Structure of the Indian Union: Federalism, Centre-State relationship, President: Role, power and position, Prime Minister and Council of Ministers, Cabinet and Central Secretariat, Lok Sabha, Rajya Sabha	10
3	**State Government and its Administration:** Governor – Role and position, Chief Minister and Council of Ministers, State Secretariat – Organisation, Structure and Functions	10
4	**Local Administration:** District Administration head – Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation, Panchayati Raj: Introduction, PRI – Zila Panchayat, Elected officials and their roles, CEO Zila Panchayat: Position and role, Block level: Organisational Hierarchy (different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy	12
5	**Election Commission:** Role and Functioning, Chief Election Commissioner and Election Commissioners, State Election Commission: Role and Functioning, Institutes and Bodies for the welfare of SC/ST/OBC and women	6

Chapter Wise Marks Distribution:

Module No.	Content	Total Hours	%age of Questions	Bloom's Level (if applicable)	Remarks (if any)
Module 1	Introduction	**7**	**20**		
Module 2	Union Government and its Administration	**10**	**20**		
Module 3	State Government and its Administration – Governor	**10**	**20**		
Module 4	Local Administration – District's Administration head	**12**	**20**		
Module 5	Election Commission	**6**	**20**		
Total		**45**	**100**		

Textbooks And Reference Books:

1. Indian Polity – M. Laxmikanth
2. Indian Administration – Subhash Kashyap
3. Indian Constitution – D. D. Basu
4. Indian Administration – Avasti and Avasti

(G6B-02): ECONOMICS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective:

- To build a foundational understanding of economics as it relates to capital markets.
- To establish a clear link between the various components and functioning of capital markets.

Course Outcome (CO):

To gain an understanding of economic concepts for Capital Markets

Detailed Syllabus:

Chapter	Name of the Topic	Hours	Marks
01	**Introduction** • Scope and Importance of Business Economics • Basic tools – Opportunity Cost principle, Incremental and Marginal Concepts • Basic economic relations: functional relations, equations – Total, Average and Marginal relations • Use of Marginal analysis in decision-making • Basics of market demand, market supply and equilibrium price; shifts in demand and supply curves and equilibrium	9	14
02	**Demand Analysis** • Demand Function, nature of demand curve under different markets • Elasticity of demand: meaning, significance, types (price, income, cross, promotional), measurement, and relationship with revenue concepts • Demand estimation and forecasting: meaning, significance, methods – survey and statistical (numerical illustrations on trend analysis and simple linear regression)	9	14
03	**Supply and Production Decisions and Cost of Production** • Production function: short-run (Law of Variable Proportions), two-variable inputs (isoquants, ridge lines, least cost combination), long-run function, Laws of Returns to Scale, expansion path, economies and diseconomies of scale • Cost concepts: accounting vs. economic cost, implicit vs. explicit cost, fixed and variable costs, total, average and marginal costs • Cost-Output relationship in short-run and long-run (with hypothetical numerical problems), LAC, learning curve, and break-even analysis (business applications)	9	14
04	**Market Structure: Perfect Competition, Monopoly, and Imperfect Competition** • Short-run and long-run equilibrium of a competitive firm and industry • Monopoly: short-run and long-run equilibrium • Monopolistic competition: equilibrium of a firm, role of advertising (case studies) • Oligopoly: key attributes, collusive and non-collusive models, price rigidity, cartels and price leadership (practical examples)	9	14

05	**Pricing Practices** • Cost-oriented methods: cost-plus (full cost), marginal cost pricing, mark-up pricing • Advanced methods: discriminatory pricing, multiple-product pricing, transfer pricing • Case studies on pricing methods used in the business world	9	14

Practical Skills to be Developed
Intellectual Skills:

1. Analytical skills – ability to review data, observe patterns, and draw logical conclusions.
2. Communication skills – ability to explain economic findings and reports effectively.
3. Critical-thinking skills – analyzing alternative solutions and evaluating outcomes.
4. Mathematical skills – applying quantitative techniques to solve economic problems.

Motor Skills:

1. Detail-oriented approach to analysis and reporting.
2. Strong writing skills for clear documentation of economic insights.

Assignments

- Case study analysis on demand forecasting techniques.
- Practical exercises on break-even analysis and cost-output relationships.
- Report preparation on pricing practices adopted by leading companies.
- Mini-project on market structures with real-world examples.

Text Books

1. Roy E. Bailey – The Economics of Financial, Cambridge University Press.
2. Paul Heyne, Peter Boettke, David Prychitko – The Economic Way of Thinking , Pearson.
3. Premvir Kapoor – Sociology and Economics for Engineers , Khanna Publishing Company.

Reference Books

1. Milton Friedman – Money Mischief , Harcourt Publishers Group.

(G6B-03): MIND AND MANAGEMENT

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

1. To explore the emotional and motivational states of mind.
2. To understand and apply higher cognitive functions.
3. To develop the ability to relate cognition, conation, and affect to the human psyche in personal and professional contexts.
4. To build a connection between the brain and body through the study of human physiology.
5. To gain knowledge of various psychological processes.
6. To understand developmental changes across the human lifespan.

Course Outcome (CO):

Sl	Course Outcome (CO)	Mapped Modules
CO1	Explaining the concept and the physiological correlates of emotion	(M1) BL2
CO2	Understanding the different theoretical aspects of emotion	(M2) BL2
CO3	Explaining the concept and the physiological correlates of motivation	(M3) BL2
CO4	Understanding the different theoretical aspects of motivation	(M4) BL2
CO5	Labelling different span of attention	(M5) BL2
CO6	Assessment of memorization capacity	(M6) BL1, BL2

Detailed Syllabus:

Module 1 – Emotion *(Total Hours: 5)*

- Define Emotion: Nature, Impact & Expression.
- Physiological correlates of emotion: Electrical changes, Circulatory changes, Respiration, and Peripheral measures.
- Role of Cortex, Hypothalamus & Limbic System in Emotions.
- Concept of Homeostasis.
- Kluver-Bucy Syndrome.

Module 2 – Theories of Emotion *(Total Hours: 6)*

- James-Lange Theory of Emotion.
- Cannon-Bard Thalamic Theory of Emotion.
- Activation Theory of Emotion (Lindsley).
- Two Factor Theory (Schachter-Singer).
- Cognitive Appraisal Theory (Lazarus).
- For each theory: Concept, Research Evidence, Implications, and Critical Appraisal.

Module 3 – Motivation: Concept & Physiological Basis *(Total Hours: 6)*

- Concept of Motivation, Drive, Need, Impulse.
- Role of motivation in education.
- Physiological basis of hunger and thirst:
  - Mechanisms within the system.
  - Neurobiological underpinning.
- Emphasis on relevant research evidence.

Module 4 – Theories of Motivation & Cognitive Processes *(Total Hours: 8)*

- **Theories of Motivation**:
  - Maslow's Need Hierarchical Theory.
  - McClelland's Achievement Motivation Theory.
  - Murray's Theory of Psychogenic Needs.
  - For each: Concept, Research Evidence, Implications, and Critical Appraisal.
- **Applications of Motivation Theories.**
- **Thinking and Reasoning:**
  - Nature of thinking.
  - Inductive and Deductive reasoning.
  - Problem solving approaches.

Module 5 – Practicum: Attention *(Total Hours: 9)*

- Assessment of different spans of attention:
  - Sustained attention → Digit Vigilance Test.
  - Divided attention → Triad Test.
  - Focused attention → Trail Making Test.

Module 6 – Practicum: Memory and Learning *(Total Hours: 11)*

- Interpretation and practical application of memory, learning, and forgetting.
- Experiments on:
  - Whole vs Part learning.
  - Spaced vs Un-spaced learning.
  - Retroactive inhibition.
  - Proactive inhibition.
- Learning curve.

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	Bloom's Level	Remarks (if any)
Module 1	Define Emotion and Physiological correlates of emotion: Electrical, Circulatory changes, Respiration and Peripheral measures. The role of Cortex in Emotions. Concept of Homeostasis.	5	15	2	

Module 2	Theories of Emotion: James-Lange; Cannon-Bard, Lindsay, Schachter-Singer, and Lazarus	6	20	2	
Module 3	Understanding the concept of Motivation in connection to its role in education and physiological basis of hunger, thirst.	6	20	2	
Module 4	Theories of Motivation – Maslow, McClelland, Murray. Application. Nature of thinking; Inductive and Deductive reasoning; Problem solving approaches.	8	15	2	
Module 5	Practicum – Assessment of different spans of attention: sustained attention (digit vigilance test), divided attention (triad), focused attention (trail making).	9	15	2	
Module 6	Practicum – Interpretation and practical application of memory, learning and forgetting: whole vs part learning, spaced vs un-spaced learning, retroactive & proactive inhibition, learning curve.	11	15	1, 2	
Total		**45**	**100**		

Suggested Readings:

1. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2006). Introduction to Psychology *(*7th ed.).
2. Fredrickson, B., Loftus, G.R., Lutz, C., & Nolen-Hoeksema, S. (2014). Atkinson and Hilgard's Introduction to Psychology. Cengage Learning EMEA.
3. Schultz, D.P., & Schultz, S.E. (2020). Psychology and Work Today. Routledge.

(G6B-04): SUSTAINABILITY & FASHION

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives:

- To provide working knowledge of Environmental, Sustainable, and Ethical issues prevailing in the world.
- To enable students to understand the relationship between sustainable development goals and the fashion industry.

Course Outcomes (COs):

Sl. No.	Course Outcome (CO)	Mapped Modules
CO1	Remember & Understand Environmental, Sustainable & Ethical issues being faced today and their causes	M1
CO2	Remember & Understand the Role of sustainable, ethical, and environmental organizations	M2
CO3	Remember & Understand the innovation in sustainable thinking for the future	M3
CO4	Remember & Understand the roles and impact designers have on the natural resources and the environment	M4
CO5	Remember & Understand the renewable & non-renewable energy	M5
CO6	Remember & Understand the possibilities in sustainable and ethical fashion	M6

Detailed Syllabus

Module I (8 Hours) – *Environmental & Sustainability Issues*

- Climate Change & Global Warming
- Pollution
- Resource depletion
- Consumerism and the throw-away society

Module II (6 Hours) – *Sustainable & Ethical focused Organizations*

- Greenpeace
- Earthday Network
- Ethical Fashion Forum

- United Nations
- Fair Trade
- World Wildlife Fund (WWF)

Module III (6 Hours) – *Innovations in Sustainable Thinking for the Future*

- UN Sustainable Development Goals
- The Paris Climate Agreement
- Ocean Clean-Up

Module IV (6 Hours) – *Resource Consumption and Depletion*

- Deforestation
- Fossil Fuels
- Sand
- Minerals
- Precious Stones & Metals

Module V (9 Hours) – *Renewable vs. Non-Renewable Energy*

- Impact of non-renewable (fossil fuel-based) energies
- Renewable energy systems and technology innovations
- Sustainable energy schemes and initiatives in India

Module VI (10 Hours) – *Fashion Design & Sustainability*

- Sustainable fashion design concepts
- Sustainable materials for fashion
- Impacts of material choices
- Future trends within sustainable fashion
- Key issues faced by the fashion and textiles industry
- Impact of new and emerging technologies

Module Wise Marks Distribution:

Module	Content	Total Hours	% of Questions	Bloom's Level	Remarks
M1	Environmental & Sustainability Issues	8	20	1, 2	
M2	Sustainable & Ethical focused Organizations	6	14	1, 2	
M3	Innovations in sustainable thinking for the future	6	14	1, 2	
M4	Resource consumption and depletion	6	16	1, 2	
M5	Renewable Energy vs. Non-Renewable Energy	9	16	1, 2	

M6	Fashion Design & Sustainability	10	20	1, 2	
	Total	**45**	**100**		

Suggested Readings

Textbooks

1. Robert Brinkmann – Introduction to Sustainability (2016)
2. Sian Moxon – Sustainability in Interior Design

References

- Centre for Sustainable Fashion – www.sustainable-fashion.com
- MISTRA Future Fashion – www.mistrafuturefashion.com
- Sustainable Clothing Action Plan: Clothing Knowledge Hub
- Textiles Environment Design
- Textile Futures Research Centre
- Sandy Black – The Sustainable Fashion Handbook (2012)
- Tamsin Blanchard – *Green* is the New Black: How to Change the World with Style (2008)
- Michael Braungart & William McDonough – Cradle to Cradle: Remaking the Way We Make Things (2009)
- Sass Brown – ReFashioned: Cutting Edge Clothing from Recycled Materials *(*2013)
- Elisabeth Cline – Overdressed: The Shockingly High Cost of Cheap Fashion (2012)
- Kate Fletcher & Lynda Grose – Fashion and Sustainability: Design for Change (2012)

(G6B-05): INDIAN HISTORY AND CULTURE

Credit Point: 3
Total Credit Hours: 45 Hrs.

Detailed Syllabus:

Sl. No.	Topic / Module	Hours
1	**Unit I** – The Pre-historic Period, Indus Valley Civilization: Sources of Information, Characteristics of Indian Culture & Society in the Pre-historic Ages and Indus Valley Civilization. Vedic Period – Early and Later Vedic period. Jainism: Teachings & Principles, Contribution of Jainism to Indian Culture. Buddhism: Rise and Growth, Doctrines of Buddhism.	8
2	**Unit II** – Mauryan Period: Origin, growth and contribution. Sunga Dynasty, Kusana Dynasty. Gupta Period – Political, religious, socio-cultural and economic development during Maurya to Gupta period. Art & Architecture during Mauryan and Gupta period. Political condition of North India, South India and Eastern India after Guptas.	8
3	**Unit III** – History of Medieval India (1206 – 1526 A.D.): Rise of Turks, causes of success of Arab invasion and its impact. Slave Dynasty, Khalji Dynasty, Tughlaq Dynasty, Sayyid Dynasty, Lodhi Dynasty, Mughal Dynasty. Indo-Islamic & Mughal Architecture.	8
4	**Unit IV** – Political Condition of India after Mughals: Decline of Mughal Emperor and its impact. Shivaji & the rise of the Marathas. Advent of Europeans in India – Establishment of East India Company and other European companies. Establishment of British Rule in India.	7
5	**Unit V** – Social and Religious Reform Movements in India: Brahma Samaj, Arya Samaj, Ramakrishna Mission. Social Traditions, Economic, Political, Religious and Social development post-Independence.	7
6	**Unit VI** – Concept of Cultural Tourism: Performing Arts – Classical Music, Classical Dance (various forms), Theatre. Visual Arts – Paintings, Sculpture. Different fairs & festivals in India. Various handicraft items in India. Folk culture in India.	7
	Total Hours	**45**

Suggested Readings

1. Themes of Indian History – Part 1, 2, 3 – NCERT (2013)
2. Mitter, Partha (2001), Indian Art, Oxford Publications, London
3. R. S. Sharma – India's Ancient Past, Oxford University Press
4. Romila Thapar – Penguin History of India
5. R. C. Mazumdar, H. C. Roychowdhury & K. K. Dutta – Advance History of India
6. Nitin Singhania (2015), Indian Art and Culture, Tata McGraw Hill Education
7. Mukul Chandra Bora – Bhartiya Knowledge System, Khanna Publishing House

(G6B-06): VALUES & ETHICS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Detailed Syllabus:

Sl. No.	Topic / Module	Hours
1	**Module 1: Indian Society** – Society and its types. Features of Tribal Society, Agrarian Society, Industrial Society, Post-Industrial Society. Population and Society – Interface between population size and social development. Concepts and measurement of population: Birth rate, Death rate, Migration. Population pyramid of India, Social implications of age-sex in India. Population Explosion & its consequences. Population policy of Govt. of India – a critical appraisal, problems of implementation, causes for success and failures.	10
2	**Module 2: Social Stratification** – Concepts, Types, Social Mobility. Socio-Economic Problems: Poverty, Illiteracy, Unemployment, Child Labour, Occupational Diseases, Crime, Project Affected People, Aged Population, Juvenile Delinquency. Strategies to solve/minimize the problems.	6
3	**Module 3: Industry and Society** – Factory as a Social System, Formal and Informal Organization. Impact of Industry on Society (Family and Industry). Social and Cultural Impediments to Industrialization.	6
4	**Module 4: Value** – Definition, Importance and application of Value in life. Formation of Value: Process of Socialization, Self and Integrated Personality. Types of Values: Social, Psychological, Aesthetic, Spiritual, Organizational. Value crisis in contemporary society: individual, societal, cultural and management level (strategy and case studies).	9
5	**Module 5: Introduction to Business Ethics** – Definition and Importance. Ethics in the Workplace: Code of Conduct, Code of Ethics.	5
6	**Module 6: Corporate Responsibility** – Definition and Case Study. Corporate Compliance: Definition, Responsibility, Laws and Regulations. Consumer Rights: Expectations and Reality, Connection between Business and Society.	9
	Total Hours	**45**

Suggested Readings

1. André Béteille – Society and Politics in India, OUP
2. C. N. Shankar Rao – Sociology, S. Chand
3. Ram Ahuja – Social Problems in India, Rawat Publication
4. A. C. Fernando (Late) – Business Ethics: An Indian Perspective (2/e), Pearson
5. Manna and Chakraborty – Value and Ethics in Business and Profession, PHI
6. Shailendra Kumar & Alok Kumar Rai – Business Ethics, Cengage Learning India Pvt. Ltd.
7. Professional Ethics and Human Values | AICTE Recommended, Khanna Publishing House

(G6B-07): Enhancing Linguistic Competence & Developing LiterarySkills

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective: The course is designed to provide a deep insight into the various vistas of English Language and develop the literary aptitude to face the world with confidante.Apart from the conventional grammar lessons; the selected pieces from the domain of literature will enhance the depth of the students in the subject. The prose and novel sections will enable them to thinkbeyondthebooks. However, thepoemswill make the individuals take aflight of fantasy. The classic blend of language and literature is certainly a boon for the aspiring candidates. This is really a unique approach towards the new world of humanities and will hopefully be accepted and embraced by all and sundry.

Course Outcomes (CO):

S. No.	Course Outcome (CO)	Mapped Modules
1	Understand the structure and function of Grammar.	M1 & M2
2	Understand the approach towards dealing with the topics of variety and beyond.	M2 & M4
3	Understand and develop a strong passion for the literary pieces.	M3 & M4
4	Understand the technical device of Literary Skills comprising Rhetoric & Prosody.	M4 & M2
5	Understand and apply the basic linguistic skills pertaining to the domains of grooming (speaking, listening, reading).	M1 & M5

Detailed Syllabus

Module 1: Introduction to Grammar and Application

- Phrases & Clauses
- Noun Case and Noun Gender
- Verbs of Incomplete Predication
- Mood and Tense
- Analysis of Sentences (Compound only)
- Synthesis of Sentences
- Idioms
- Punctuation

Module 2: Writing Skills of Variety

- Essay Writing: Descriptive, Reflective, and Analytical
- Story Writing
- Short Poems
- Letters (Professional approach)
- Autobiographies

- Précis Writing
- Dialogue Writing

Module 3: Selected Pieces from Prose, Poetry & Novel

Novel:

- *Far From the Madding Crowd* – Thomas Hardy

Prose (Short Stories):

1. *Fly* – Katherine Mansfield
2. *The Kite* – Somerset Maugham
3. *The Hungry Stone* – Rabindranath Tagore

Poetry:

1. *To Daffodils* – Robert Herrick
2. *A Musical Instrument* – Elizabeth Barrett Browning
3. *My Last Duchess* – Robert Browning

Module 4: Practicing Rhetoric and Prosody

Rhetoric (Figures of Speech):

- Simile, Metaphor, Pun, Onomatopoeia, Alliteration, Assonance
- Imagery, Litotes, Synecdoche, Personification
- Epigram, Transferred Epithet, Climax, Anticlimax

Prosody:

- Scansion of selected passages from poetry

Module 5: Communication & Soft Skills Development

- Concepts of Listening, Speaking, and Reading
- Tactics to Face Interview Challenges
- Composing CV and Applications (latest trends)
- Motivational Sessions and Mock Sessions

Module Wise Marks Distribution:

Module No.	Content	Total Hours	% of Questions	Bloom's Level (if applicable)	Remarks
M1	Introduction to Grammar and Application	7	15%	1	–
M2	Writing Skills of Variety	7	20%	1, 2	–
M3	Selected Pieces from Prose, Poetry & Novel	12	30%	2, 3	–
M4	Literary Devices (Rhetoric & Prosody)	12	20%	3, 4	–
M5	Oral Linguistic Competence & Interview Development	7	15%	1, 5	–
	Total	**45**	**100%**	–	–

Suggested Readings

1. High School Grammar & Composition – Wren & Martin, S. Chand & Company Ltd.
2. Principles of English (Rhetoric & Prosody) – M. Chakroborti, The World Press Pvt. Ltd.
3. College Essays – D. N. Ghosh, Calcutta Book Publishers
4. Personality Development & Soft Skills – Barun K. Mitra, Oxford Higher Education
5. Effective Communication Skills – Kulbhushan Kumar, Khanna Publishing House

(G6B-08): MEDICAL ETHICS, LAW AND ETIQUETTE

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objectives: This course is designed to provide students the key concepts in healthcare ethics and its core principles. The use and application of this information can help students learn about various medical law and ethical issues in this emerging field.The students will learn the fundamentals of ethicalrelationships that govern healthcare system.

CourseOutcomes (CO):

Sl. No.	Course Outcome (CO)	Mapped Modules
1	Understanding the concept of Medical Profession	M1
2	Understanding Essential elements of Contract	M2
3	Understanding Legal Aspects of the Various Acts	M3
4	Understanding the theory of Euthanasia and its legality in India	M4

Detailed Syllabus

Module 1: Concept of Medical Profession

- Definition of hospital
- Ethics, Law and Ethics – differences
- Hippocratic Oath, Geneva Declaration
- Managing violence at the workplace
- Ethical principles: Autonomy, Justice, Beneficence, Non-Maleficence, Fidelity, Confidentiality

Module 2: Essential Elements of Contract & HIPAA

- Contract essentials: Offer, Acceptance, Legality, Free consent, Enforceability, Competency, Void contracts
- HIPAA Law and its application in hospitals
- Patient security and violation
- Doctor–patient relationship and medical malpractice

Module 3: Legal Aspects of Healthcare Acts

- Organ Transplant Act, 1994
- Medical Termination of Pregnancy Act, 1971
- Prenatal Diagnostic Techniques Act, 1994
- Drugs and Cosmetics Act, 1940
- Indian Medical Degree Act, 1956

Module 4: Euthanasia and Consent

- Euthanasia: Definition, Types, Legality in India
- Comparative study with assisted suicide
- Types of medical consent (implied, expressed)
- Basic aspects of consent

Module Wise Marks Distribution:

Module Number	Content	Total Hours	% of Questions	Bloom's Level
M1	Concepts of medical profession, its ethical values and principles	8	20%	1, 2
M2	General law of contract, patient protection, contact tracing for Covid-19 patients	10	20%	1, 2
M3	Legal aspects of Organ Transplantation Act, MTP Act (1971), Drugs & Cosmetics Act, PNDT Act 1994	15	40%	1, 2, 3
M4	Euthanasia: ethical issues involved, informed consent, debates for and against euthanasia	12	20%	1, 2
	Total	**45**	**100%**	

Suggested Readings:

1. Wilkinson, Jonathan & Julian (13th Edition). Medical Ethics and Law – A Curriculum for the 21st Century.
2. Loewy, Enrich H. Textbook of Medical Ethics.
3. Bhat, Sandeepa. Medical Law and Ethics in India.
4. **Web Resources:**National Center for Biotechnology Information (NCBI), SlideShare, Wikipedia

(G6B-09): LAW AND ETHICS

Credit Point: 3
Total Credit Hours: 45 Hrs.

Detailed Syllabus:

Module I

General Law of Contract

- Essentials of a Contract: Offer and Acceptance, Capacity of Parties, Free Consent, Consideration, and Legality of Object.
- Void Agreement and Contingent Contract.

Module II

Consumer and Clinical Laws

- Consumer Protection Act, 1986.
- West Bengal Clinical Establishment Act, 2000.
- Legal aspects relating to Organ Transplantation.
- Medical Termination of Pregnancy Act, 1971.

Module III

Medical Laws and Ethics

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- Drugs and Cosmetics Act, 1940.
- Pre-Natal Diagnostic Techniques (PNDT) Act, 1994.
- Definition of Ethics.
- Ethical Principles & Rules: Core Concepts.
- Law and Ethics – A Comparison.
- Geneva Declaration.

Module IV

Law and Ethics in the Medical Profession

- Indian Medical Degree Act, 1916.
- Indian Medical Council Act.
- Consent: Implied and Expressed Consent.
- Medical Negligence.

- Helsinki Declaration on Medical Research.
- ICMR Guidelines of Medical Research.
- Euthanasia – Ethical Framework on Decision-Making.

Suggested Readings:

1. Kapoor, N.D. (2004). Mercantile Law (Chapters 1–5). Sultan Chand & Sons, New Delhi.
2. Kuchhel, M.C. (2003). Mercantile Law (Chapters 1–5). Vikas Publishing Pvt. Ltd., New Delhi.
3. Pathak. Legal Aspects of Business. Tata McGraw Hill (TMH).
4. Mallick, P.L. Industrial Law. Eastern Book Company, Lucknow.
5. Bio-Medical Waste Management Handling Rules, 1998.
6. Law & Ethics in Nursing & Health Care. Nelson Thornes.

(G6B-10): SURFACE & SOFT FURNISHINGS DESIGN DEVELOPMENT TECHNIQUES

Credit Point: 3
Total Credit Hours: 45 Hrs.

Course Objective: The course is designed to provide a conceptual understanding of interior design of spaces with surface and soft furnishings. The students will be able to visually express with colour, texture, pattern and material effects for surface design appropriate to project specifications.

Course Outcome (CO):

Sl. No.	Course Outcome	Mapped Modules
1	Understand the fundamental interior design aspects of surface and soft furnishings	M1, M2, M6
2	Understand the fundamentals of textiles and their types	M1, M2
3	Understand and demonstrate printing techniques	M2, M3
4	Understand and apply embroideries	M2, M3, M4
5	Understand and examine materials, techniques, and technology	M1, M2, M5
6	Apply the surface designs	M5, M6

Detailed Syllabus

Module–1: Textiles and Its Types

- Introduction to textiles – Indian (Kalamkari, Matanipachedi, Ikkat) and International textiles.
- Special embellishment techniques: Batik, Tie and Dye (Leheriya, Bandhini, Shibori, Sunray, and Marbling).

Module–2: Research on Soft Furnishings and Textiles/Fabrics Used in Design

- Table Linens
- Rugs & Carpets
- Window Dressings (Curtains & Blinds)
- Towels
- Bedding & Bedspreads
- Cushions & Throws
- Lampshades
- Wallpaper
- Tiles
- Flooring

Module–3: Printing and Its Techniques

- Print application through Block Printing, Linoprinting, Woodcut Printing, Lithograph Printing.
- Print application through Screen & Block Printing (Vegetable Block and Wooden Blocks).

- Techniques: Appliqué, Quilting, Smocking, Honeycomb, Fabric Painting, Stencil (Dabbing and Spraying).
- Natural dyeing techniques and explorations.

Module–4: Embroideries and Its Types

- **Basic Hand Embroidery:** Running Stitch, Backstitch, Stem Stitch, Chain Stitch, Lazy Daisy Stitch, Buttonhole Stitch, Featherstitch, Herringbone Stitch, Knot Stitch, Satin Stitch, Cross-stitch.

- **Traditional Embroidery:** Origin, application & colours – Kantha, Chikan, Kasuti, Zardosi, Kutch, and Mirror work.

Module–5: Exploration of Materials, Techniques and Technologies for the Development of Surface Design

- Printing – Screen, Block, Mono, etc.
- Stenciling
- Fabric Dye (Natural and Azo-free)
- Fabric Paints
- Fabric and Textile Embellishment

Module–6: Final Surface Designs and Presentation

- Development of surface designs for a range of applications.

Reference Books:

1. The Complete Technology Book on Dyes & Dye Intermediates – NIIR Board of Consultants & Engineers, 2003.
2. Biodegradation of Azo Dyes – Hatice Atacag Erkurt (Ed.), Springer, 2010. ISBN-10: 3642118917.
3. Second Skin: Choosing and Caring for Textiles and Clothing – India Flint, Murdoch Books, 2011. ISBN: 978-1-74196-720.
4. Indigo: The Color that Changed the World – Catherine Legrand, Thames & Hudson, 2013. ISBN: 978-0500516607.
5. Warp and Weft: Woven Textiles in Fashion, Art and Interiors – Jessica Hemmings, Bloomsbury, 2012. ISBN: 978-1-4081-3444-3.
6. Quilt National 2013: The Best of Contemporary Quilts – The Dairy Barn Cultural Arts Center, 2013. ISBN: 978-0-9818860-4-6.
7. Surface Design for Fabric (Studio Access Card) – Kimberly Irwin, Fairchild Books, 2015. ISBN-10: 1501395033.
8. Quality Management in Garment Industry – B. Purushothama. ISBN: 9789355388230.

Web Resources

- Houseology – Soft Furnishings Design School
- Two Sisters Eco Textiles – Azo Dyes

(G6B-11): DESIGN & HUMAN EVOLUTION

Credit Point: 3

Total Credit Hours: 45 Hrs.

Course Objectives:

To provide an overview of human evolution from prehistoric times through the lens of visual perception and design development. This course is aimed to enable the students to identify and analyse humankind's creative evolution through the ages by focusing on the visual forms and arts, culture and society, storytelling and communication and its direct impact on the world of design.

Course Outcomes (CO):

Sl	Course Outcome (CO)	Mapped Modules
1	Remember & Understand the beginning of human evolution through pre-history	M1
2	Remember, Understand & Analyze the role of civilizations in the creative evolution of humankind	M2
3	Remember & Understand the importance of culture and society in the development of the visual arts	M3
4	Understand & Analyze the advancement of technology and its impact on design	M4
5	Remember, Understand & Analyze art movements and their impact on design development	M5
6	Understand & Analyze the impact of the digital age on the design industry	M6

Detailed Syllabus:

Module I: Prehistory (6 Hours)

- The Stone Age – brief understanding of human evolution through Parietal Art
- Major innovations in primitive human society

Module II: Protohistory and Civilizations (9 Hours)

- The impact of the Metal Age in the birth and advancement of civilizations
- Civilizations – comparative analysis through:
  - Language & Script
  - Mythology
  - Visual Forms & Artifacts
  - Culture & Society

Module III: Middle Ages and Renaissance (7 Hours)

- The Middle Ages – impact of religion and politics through symbolism
- Merging of cultures in lifestyle and visual forms
- The Renaissance – rediscovery of classical philosophy, literature, and visual arts

Module IV: Industrial Revolution and World Wars (7 Hours)

- The Industrial Revolution – impact of technology and consumerism on design application
- The World Wars I & II – analysis of changes before and after in different industries

Module V: Art Movements (9 Hours)

- Schools of thought and design from the 19th century to the 21st century

Module VI: Information Age & Beyond (7 Hours)

- The Information Age (Digital Age/New Media Age) – rapid changes in lifestyle, visual perception, and communication
- The Future – what comes next?

Module Wise Marks Distribution:

CO	Bloom's Level (if applicable)	Modules	% of Questions
CO1	1, 2	Module 1	15%
CO2	1, 2, 4	Module 2	20%
CO3	1, 2	Module 3	15%
CO4	2, 4	Module 4	15%

Suggested Readings

1. David Raizman – History of Modern Design, Prentice Hall, 2004
2. Cross, N. – Design Thinking: Understanding How Designers Think and Work, Berg, Oxford, 2011
3. Johanna Drucker & Emily McVarish – Graphic Design History: A Critical Guide
4. Historic Costume – From Ancient Times to Renaissance, Dover Publications
5. A Pictorial History of Costume, Pepin Press
6. Journal of Design History, Oxford Journals
7. Carter Ron, Day Ben Meg Phillip – Typographic Design: Form and Communication, John Wiley & Sons, 1999
8. William Neill (Photographer), Pat Murphy – By Nature's Design – An Exploratorium Book, Chronicle Books, 1993
9. Paola Antonelli – Objects of Design, Museum of Modern Art, 2003
10. Clive Cazeaux – The Continental Aesthetics Reader, Routledge, 2011
11. Ann Marie Barry – Visual Intelligence: Perception, Image, And Manipulation In Visual Communication, State University of New York Press, 1999