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VIDYAPEETH

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LINGAYA'S VIDYAPEETH,
FARIDABAD

NATIONAL ASSESSMENT ACCREDITATION COUNCIL
SSR (2nd CYCLE)

INDEX

Key Indicator – 1.1 Curriculum Design and Development

Metric	Particular	
1.1.1	Curricula developed and implemented have relevance to the local, regional, national, and global developmental needs, which is reflected in the Programme outcomes (POs), and Course Outcomes(COs) of the Programmes offered by the University	
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School of Architecture B.Arch

Program Outcomes (PO's)

PROGRAMME OUTCOMES are skill sets and attributes which all students will acquire during the program and will be competent in.

Architecture Graduates will be able to:

1. **Architectural knowledge:** Interpreted the knowledge of Design parameters, mathematical analysis, construction technology, architectural fundamentals and latest development in various field for the solution of complex architectural design problems.
2. **Problem analysis:** Identify, formulate, review research literature and analysis of complex architectural problems reaching substantiated conclusions using first principles of basic design, users comfort concerns, climate oriented solutions, and architectural services.
3. **Design/development of solutions:** Design solutions for complex architectural problems and design system components or processes that meet the specified user and environmental needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental issues.
4. **Conduct investigations of complex problems:** Integrate research-based knowledge and research methods including experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern analytical tools and simulation of complex architectural activities with an understanding of the limitations.
6. **The architect and society:** Evaluate contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional architectural practice.
7. **Environment and sustainability:** Elaborate the impact of the professional architectural solutions in societal and environmental contexts, demonstrate the knowledge and need for sustainable development.
8. **Ethics:** Integrate ethical principles and commitment to professional ethics, responsibilities and norms of the architectural practice.
9. **Individual and team work:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex architectural activities with the architectural and allied community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
11. **Project management and finance:** Synthesize knowledge and understanding of the architectural and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Relate to the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of environmental, social, economic, and technological changes.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

Architecture Graduates will be able to:

- PSO 1 **Human psychology and Philosophy:** Interpret human behavior and mental processes, including perception, cognition and emotion by understanding real time architecture project
- PSO 2 **Indian Traditions and Culture:** Amalgamate basic concepts of Indian values and ethics with contemporary techniques to form modern social fabric

Cos			
M1	Introduction to Architecture	1	Create an piece of art
		2	Appraise architecture profession
		3	Correlate various courses in architecture pedagogy
		4	Demonstrate hand eye Coordination through sketches
		5	Value role of human settlement in history
M2	Art and Architecture	1	Apply 2D orthographic projections
		2	Create a 2D composition in color medium
		3	Create a 3D composition using Google Sketch up.
		4	Demonstrate better hand eye Coordination through line drawings using manual drafting
		5	Follow Gestalt theory of visual perception
M3	Language of Architecture	1	Apply basic architectural terminologies in speech and writing
		2	Appraise painting on the principles of design
		3	Appraise building form on the basis of solids, voids, shades and shadows
		4	Create forms using clay and pottery
		5	Participate in debates and group discussion
M4	Product Analysis	1	Appraise different types of structural forces
		2	Appraise the correlation between human measurements and surrounding
		3	Develop basic comm. Skills and sense of composition and design
		4	Create forms using pottery
		5	Participate in debates, group discussion and presentation
M5	Workshop	1	Make wooden joints using carpentry tools
		2	Make kinetic models
		3	Make 3D geometric models with paper
		4	Use laser cutter to build models
		5	Value hands on experience of workshop
M6	Universal Design	1	Analyze architecture of early river civilizations
		2	Organize furniture layout for monocellular units such as kitchen, toilet, bedroom, living room
		3	Analyze human activities on the basis of space requirement
		4	Apply basic concepts of water supply for monocellular unit
		5	Apply basic concepts of brick masonry
M7	Moments	1	Construct structural model based on truss
		2	Make models/sketches based on Roman History
		3	Make models/sketches based on Greek History
		4	Analyze a room using ecotect software
		5	present a seminar on Greek and Roman history
M8	Context	1	Design a house with brick

		2	Produce a measure drawing of a given building
		3	Adapt their design to climatic considerations
		4	Use surveying techniques and equipment to measure a building
		5	Organize and plan a study trip
M9	Arboratum	1	Design a house with timber
		2	Illustrate constructional details using timber and stone
		3	Confirm to Indian tradition, crafts and culture
		4	Produce digital rendering of residence
		5	Develop understanding of the environment and related issues
M10	Sciography	1	Apply knowledge of sciography in architectural drawings
		2	Create digital portfolio of academic work
		3	Do a Presentation of academic work
		4	Analyze light and shade through Charcoal study
		5	Construct a scale model of a timber residence
M11	Large Span	1	Apply the basic concepts of concrete as a construction material
		2	Illustrate various structural systems
		3	Compare various properties of concrete through testing
		4	Make scale models of structural systems
		5	Justify the role of structural system in architectural design
M12	Sociology	1	Analyze social behavior changes in an urban village
		2	Organize social field surveys
		3	Create art work based on social issues
		4	Predict attitude and social behavior
		5	Experience team work and social behavior patterns
M13	Pavllion	1	Apply basic concepts of electrical and lighting services
		2	Apply basic concepts of firefighting services
		3	Apply basic concepts of lift and escalators in a multipurpose hall
		4	Illustrate early Christian to gothic architectural history
		5	Create multipurpose hall on the basis of structural systems
M14	Reinforced Cement Concrete	1	Illustrate Reinfoced Cement Concrete construction techniques
		2	Apply Reinfoced Cement Concrete structural analysis to a residence
		3	Design institutional building for children with RCC
		4	Illustrate architectural historical concepts from renaissance period to rococo period
		5	Apply basic concepts of soil mechanics
M15	Reminder/ Render	1	Render virtual 3D models in V-Ray
		2	Make working drawings of a given building
		3	Brick house in revit software

		4	Simulate complete design process
		5	Apply basic concepts of soil types and properties
M16	Vernacular	1	Analyze concepts of vernacular architecture in different regions of India
		2	Apply basic principles of acoustics in built environment
		3	Display professional commitment to ethical practice on every day basis
		4	Make scale models of various styles of vernacular architecture in groups
		5	Illustrate basic application of vernacular architecture in contemporary scenario
M17	Steel	1	Analyze structural design of steel buildings
		2	Apply basic concepts of steel as a construction material
		3	Design an abstract (conceptual) form using steel as a building material
		4	Illustrate steel construction details
		5	Make a scale 3-dimensional model with steel
M18	Decoding Pattern	1	Analyze patterns in built form and nature
		2	Illustrate architectural history from Vedic to Dravidian period
		3	Organize and plan a study trip
		4	Create an art installation based on patterns (art thesis)
		5	Illustrate construction details related to non-ferrous metals, GRC , UPVC, Plastics rubbers and asbestos
M19	Climate Responsive Architecture	1	Internalize energy conscious concepts in built environments
		2	Design of hostel building based on principles of sustainability
		3	Create working drawings of a hostel building
		4	Construct and simulate a scale model of hostel building
		5	Illustrate Indian architectural history from Islamic to Colonial period
M20	Façade	1	Relate outer surface of buildings with its structure for performance improvement
		2	Create a building façade
		3	Analyze Glass as Building material
		4	Appraise manufacturing and processing of glass through industrial visit
		5	Justify the role of facade system in built environment
M21	Cogent	1	Design an art gallery
		2	Appraise renowned architects work to understand their design philosophies
		3	Appreciate various design styles and movements
		4	Make a scale model of art gallery
		5	Develop his own Philosophy/Rational thought process

M22	Cogent 2	1	Design an art gallery
		2	Appraise renowned architects work to understand their design philosophies
		3	Appreciate various design styles and movements
		4	Make a scale model of art gallery
		5	Develop his own Philosophy/Rational thought process
M23	Dionysia	1	Analyze large span roof forms
		2	Design an auditorium
		3	Apply the principles of acoustics in design of auditorium
		4	Compose a drama script and enact the same in groups
		5	Illustrate architectural history from modern to Contemporary period
M24	Décor	1	Apply basic concepts of interior design
		2	Design interior of a restaurant
		3	Design a commercial kitchen
		4	Create furniture elements
		5	Estimate the cost of interiors in a built structure
M25	BIM	1	Analyse interior specifications
		2	Analyse interior estimation and costing
		3	Create a project report of Ground+1 brick residence
		4	Apply basic concepts of building information modelling software
		5	Model a DPR in BIM software
M26	Pre-Fab	1	Analyze defects and remedies in buildings
		2	Analyze retrofitting in buildings
		3	Analyze prefabricated speedy construction in a building
		4	Apply basic concepts of modular construction
		5	Appreciate the role of prefab construction in respect of technology, culture, time and environment
M27	Tall Building	1	Design core of a tall building
		2	Analyse structural system of a tall building
		3	Illustrate evolution of mega structures
		4	Analyse building on the basis of earthquake and dynamic loads
		5	Appreciate the role of services in tall building design
M28	Neighbourhood	1	Apply basic theory of design
		2	Analyse advance structural concepts
		3	Analyse advance services concepts-(automation)
		4	Illustrate basic concept of neighbourhood and masterplans
		5	Design vertical housing
M29	Agora	1	Analyse theory of design
		2	Analyse basic concepts of waste management
		3	Design a landscaped central court of vertical housing
		4	Write a dissertation

		5	Design a shopping mall
M30	Management	1	Analyse building specifications
		2	Analyse building estimation and costing
		3	Appreciate the role of economics in built environment
		4	Apply building byelaws to their design
		5	Make a detail working drawing of shopping mall
M31	Resurgence	1	Apply basic concepts of environment and ecology
		2	Evaluate the impact of environmental pollution
		3	Apply basic concepts of environmental laws and regulations
		4	Make Environmental impact assessment reports
		5	Value the role of sustainability in built environment
M32	Ocular	1	Apply basic concept of the elective topic
		2	Appreciate the role of Elective topic in global scenario
		3	Internalize the values of the topic
		4	Conduct the surveys on the topic given
		5	Present the researched topic in an seminar
M33	Hospitality	1	Design a hotel with convention center
		2	Apply basic concepts of service floor and safety in built environment
		3	Design indoor recreational facilities
		4	Application of waste management techniques in hotel
		5	Make a detail working drawing of service floor
M34	Healthcare	1	Design a hospital
		2	Illustrate low-cost constructional techniques
		3	Apply basic concepts of hospital information system
		4	Design healing landscapes
		5	Internalize the values of hygiene and social care
M35	Perception	1	Apply basic concept of the elective topic
		2	Appreciate the role of Elective topic in global scenario
		3	Internalize the values of the elective topic
		4	Conduct the surveys related to elective topic
		5	Present research work through seminar
M36	Internship	1	Test the theories taught
		2	Appraise the relation between the sitework and drawings
		3	Inculcate teamwork
		4	Devise a procedure for accomplishing a task
		5	Display self reliance, work ethics in an office
M37	Amenable	1	Illustrate basic concepts of smart city
		2	Illustrate basic concepts of resilient city
		3	Illustrate the contemporary trends in urban development
		4	Apply basic concepts of internet of things related to urban context

		5	Internalize the values of vision/ mission of govt. policies related to urban fabric
M38	Smart Cities	1	Apply basic concepts of the elective topic
		2	Appreciate the role of Elective topic in global scenario
		3	Internalize the values of the elective topic
		4	Conduct the surveys related to the elective topic
		5	Present research work through seminar
M39	Urban Design	1	Appreciate basic concepts of urban design
		2	Value the role of urban systems in society
		3	Illustrate history of urban design
		4	Analyze commercial district
		5	Design intervention in a bazar street
M40	Mixed Use Development	1	Illustrate concepts of professional practice
		2	Apply basic concepts of town planning
		3	Design intervention in transit-oriented development
		4	Develop a vision document for mixed land use
		5	Integrate social, ecological and economic concerns
M41	Sprawl	1	Apply basic concept of the elective topic
		2	Appreciate the role of Elective topic in global scenario
		3	Internalize the values of the elective
		4	Conduct the surveys related to elective
		5	Present research work through seminar
M42	Thesis	1	Design architectural project in totality
		2	Communicate the thesis proposal to expert jury
		3	Write thesis report
		4	Make scale model of the design thesis
		5	Value the role of time management in architectural project

School of Basic and Applied Science
B.Sc. (H) CHEMISTRY
COURSE OUTCOMES AND PROGRAM OUTCOMES
2021-22

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

PEO-1: Graduate can need to develop and apply new skills and strategies in order to address issue that arise as outcomes of new technologies.

PEO-2: Graduate will have a wide range of opportunities to get employment at local and National level, and can work as analyst, research assistant in industry and government sector job.

PEO-3: Graduate students will be able to perform synthesis, separation, and interpretation based on advanced expertise and experience.

PEO-4: Graduates will be able to formulate, study, and examine scientifically real-life issues, as well as work in a multidisciplinary team with an ethical attitude.

Mapping of PEOs with Mission Statements

PEO Statements	Department Mission 1	Department Mission 2	Department Mission 3	Department Mission 4
PEO1	3	2	1	1
PEO2	1	2	3	2
PEO3	2	3	2	1
PEO4	2	1	2	3

PROGRAM OUTCOMES (PO'S)

PO-1: Identify and resolve complex scientific issues in national and local level.

PO-2: Analyze and interpret data using analytical instruments to investigate chemical problems.

PO-3: To solve chemical problems, choose, plan, and implement suitable experiment techniques, as well as instrumentation handling.

PO-4: Recognize and use contextual multidisciplinary information to evaluate societal, health, safety, and global problem that are important to research practices.

PO-5: Adopt scientific ideas about environmental use and long-term sustainability.

PO-6: Enhance skills for future employability through activities such as seminar, communication skills, industrial visit, and internship.

PO-7 Recall the chemistry courses that are available for competitive test.

PO-8: The students attain sound knowledge in the areas of organic, inorganic, physical, pharmaceutical chemistry and material for pursuing higher education and research.

Mapping of Program Outcome with Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4
PO1	1	2	1	2
PO2	2	1	3	2
PO3	2	1	3	1
PO4	2	1	3	1
PO5	1	1	1	3
PO6	3	3	1	1
PO7	2	3	1	1
PO8	1	2	2	3

PSO1: To gain an understanding of various principles of organic, inorganic, and physical chemistry, as well as their biological implications and applications in everyday life.

PSO2: Chemistry for industries: planning, conducting experiment, and confidently handling equipment.

School of Basic and Applied Science

B.Sc (H) / Chemistry

Semester: 1

LINGAYA'S VIDYAPEETH

B.SC. HONS. (CHEMISTRY)

(FIRST SEMESTER)

BCH 110: INORGANIC CHEMISTRY-I

Course Outcomes:

1. After study of these five units student must aware with the atomic structure and role of Periodic table and their properties in the field of inorganic chemistry.
2. Student must also know the reasons and relationship between the elements situated into similar groups and similar periods.
3. Students also learn characteristic feature of different families of the element.

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	8	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	-	-	-	-	3	2	-	2

B.SC. HONS. (CHEMISTRY)
(FIRST SEMESTER)
BCH 120: PHYSICAL CHEMISTRY-I

Course Outcomes:

1. Relate the concepts of quantum chemistry and its application
2. Interrelate the study of light to the nature of the atom.
3. Correlate the atomic structure of an element to its physical and chemical properties.

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	2	-	2	1	-	2	3	1	1
CO2	2	2	1	3	1	-	3	2	2	-
CO3	1	2	-	-	-	2	1	3	-	2

B.SC. HONS. (CHEMISTRY)
(FIRST SEMESTER)
BCH 114: ORGANIC CHEMISTRY-I

COURSE OUTCOMES:

1. Students will learn to transform between bases, including the creation, geometric connections, and the application of orthogonal and orthonormal bases.
2. Students will learn Fundamental Theorem of Arithmetic
3. The course will enhance research, inquiry and analytical thinking abilities of students.

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	2	-	1	1	-	2	1	1	1
CO2	2	2	1	2	1	-	3	2	1	-
CO3	1	2	-	-	-	2	3	2	-	1

- **B.SC. HONS. (CHEMISTRY)**
 - **(FIRST SEMESTER)**
 - **BMA-111: CALCULUS**

COURSE OUTCOMES:

Upon completion of the course, the student will be able to:

1. Interpret a function from an algebraic, numerical, graphical and verbal perspective and extract information relevant to the phenomenon modeled by the function.
2. Calculate the limit of a function at a point numerically and algebraically using appropriate techniques including L'Hospital's rule.

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	1	-	1	1	-	1	1	1	1
CO2	2	2	1	2	1	-	3	2	1	-
CO3	1	2	-	-	-	2	3	2	-	1

B.SC. HONS. (CHEMISTRY)
(FIRST SEMESTER)

BEN 101: Communication Skill-I

COURSE OUTCOMES:

1. Students should be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
2. Students should be able to write analytically in a variety of formats, including essays, research papers, reflective writing, and critical reviews of secondary sources.
3. Students should be proficient in oral communication and writing

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	-	1	-	1	1	-	2	1	1	1
CO2	2	2	1	2	1	-	3	2	1	-
CO3	1	2	-	-	-	2	3	2	-	1

B.SC. HONS. (CHEMISTRY)
SECOND SEMESTER
BCH 115: PHYSICAL CHEMISTRY

COURSE OUTCOMES:

Students will gain an understanding of:

1. The relationship between microscopic properties of molecules with macroscopic thermodynamic observables
2. The differences between classical and quantum mechanics
3. Students will estimate equilibrium conversion in reversible reactions at given pressure and temperature following rigorous thermodynamic method

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	2	1	-	1	-	2	3	1	1
CO2	2	3	1	-	1	-	2	3	1	-
CO3	1	3	2	-	-	-	1	2	-	-

B.SC. HONS. (CHEMISTRY)
SECOND SEMESTER
BCH 122: ORGANIC CHEMISTRY

COURSE OUTCOMES:

1. After finishing this curriculum students are able to differentiate between alkyl aryl and aldehyde.
 2. Student aware the nomenclature of benzene derivatives
 3. Student learn synthesis of naphthalene, and other poly nuclear hydrocarbons.
- Here with this curriculum electrophilic and substitution reaction are define the properties of chemical compounds.

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	3	-	-	1	-	2	2	1	1
CO2	2	3	1	-	1	-	1	2	1	-
CO3	1	3	-	-	-	-	1	2	-	-

B.SC. HONS. (CHEMISTRY)
SECOND SEMESTER
BCH 121: INORGANIC CHEMISTRY

COURSE OUTCOMES:

4. After finishing this curriculum students are able to differentiate between alkyl aryl and aldehyde.

5. Student aware the nomenclature of benzene derivatives

6. Student learn synthesis of naphthalene, and other poly nuclear hydrocarbons.

Here with this curriculum electrophilic and substitution reaction are define the properties of chemical compounds.

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	3	-	-	1	-	2	2	1	1
CO2	2	3	1	-	1	-	1	2	1	-
CO3	1	3	-	-	-	-	1	2	-	-

B.SC. HONS. (CHEMISTRY)

SECOND SEMESTER

BPH-122: ELECTRICITY AND MAGNETISM

COURSE OUTCOMES:

Having successfully completed this module, you will be able to demonstrate knowledge and understand of

1. The use of Coulomb's law and Gauss' law for the electrostatic force
2. The relationship between electrostatic field and electrostatic potential
3. The use of the Lorentz force law for the magnetic force
4. The use of Ampere's law to calculate magnetic fields
5. The use of Faraday's law in induction problems

The basic laws that underlie the properties of electric circuit elements

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	-	-	1	-	2	2	1	1
CO2	2	3	1	-	1	-	1	2	1	-
CO3	1	3	-	-	-	-	1	2	-	-

B.SC. HONS. (CHEMISTRY)
SECOND SEMESTER
BCH 172: ORGANIC CHEMISTRY- LAB

B.SC. HONS. (CHEMISTRY)
SECOND SEMESTER
BCH 165: PHYSICAL CHEMISTRY- II LAB

B.SC. HONS. (CHEMISTRY)
THIRD SEMESTER
BCH 222: ORGANIC CHEMISTRY- III

COURSE OUTCOMES:

1. After finishing this curriculum students are able to differentiate between alkyl aryl and aldehyde.
2. Student aware the nomenclature of benzene derivatives
3. Student learn synthesis of naphthalene, and other poly nuclear hydrocarbons.
4. Here with this curriculum electrophilic and substitution reaction are define the properties of chemical compounds.

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	2	1	-	1	-	2	2	1	1
CO2	1	2	1	-	1	-	1	2	1	2
CO3	1	3	1	-	-	-	1	2	2	-

B.SC. HONS. (CHEMISTRY)
THIRD SEMESTER
BCH 219: PHYSICAL CHEMISTRY- III

COURSE OUTCOMES:

1. On finishing these modules of chemistry we are able to surface, electro and critical phenomenon.
2. It is also easy to understand thermodynamic derivation of relations between the various equilibrium constants K_p , K_c and K_x . Le Chatelier principle (quantitative treatment); equilibrium between ideal gases and a pure condensed phase.
3. Student may also able to understand the critical phenomeno

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	3	-	-	1	-	2	2	1	1
CO2	1	3	1	-	1	-	1	2	1	-
CO3	1	3	-	-	-	-	1	2	-	-

B.SC. HONS. (CHEMISTRY)
THIRD SEMESTER
BCH 221: INORGANIC CHEMISTRY- III

COURSE OUTCOMES:

1. After study of these five units student must aware with the S, and basically P, block elements and role of Periodic table and their groups in the field of inorganic chemistry.
2. Student must also know the reasons and relationship between the elements situated into similar groups and similar periods.

Students also learn characteristic feature of different families of the elements.

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	3	1	1	1	-	2	2	1	1
CO2	1	3	1	-	1	-	1	2	2	1
CO3	1	3	-	1	-	-	1	2	-	2

B.SC. HONS. (CHEMISTRY)
THIRD SEMESTER
BMA-230: DIFFERENTIAL EQUATIONS-I

COURSE OUTCOMES:

1. Students can perform abstract mathematical reasoning.
2. Students can identify and explain cases in which major results of one branch of mathematics rely nontrivially on results from another branch (e.g., the application of linear algebra to solving systems of differential equations).

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	1	1	1	-	2	2	1	1
CO2	1	3	1	-	1	-	1	2	2	1
CO3	1	3	-	1	-	-	1	2	-	2

B.SC. HONS. (CHEMISTRY)
THIRD SEMESTER
BA-272-A: ENTREPRENEURSHIP DEVELOPMENT

LEARNING OUTCOMES:

You understand different methods to assess the attractiveness of business opportunities

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	1	1	1	-	2	2	1	1
CO2	1	3	1	-	1	-	1	2	2	1
CO3	1	3	-	1	-	-	1	2	-	2

B.SC. HONS. (CHEMISTRY)
THIRD SEMESTER
BMA-231: ELEMENTARY MATHEMATICS-I

COURSE OUTCOMES:

1. Students' can perform abstract mathematical reasoning.
2. Students' can identify and explain cases in which major results of one branch of mathematics rely nontrivially on results from another branch (e.g., the application of linear algebra to solving systems of differential equations).

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	1	1	1	-	2	2	1	1
CO2	1	3	1	-	1	-	1	2	2	1
CO3	1	3	-	1	-	-	1	2	-	2

B.SC. HONS. (CHEMISTRY)
THIRD SEMESTER
BCS-201: COMPUTER FOR CHEMISTS

LEARNING OUTCOMES:

1. Develop and implement solutions to problems encountered in all phases of the design process.
2. Apply effective business practices and project management

			PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
COs		2								
CO1	1	3	1	1	1	-	2	2	1	1
CO2	1	3	1	-	1	-	1	2	2	1
CO3	1	3	-	1	-	-	1	2	-	2

B.SC. HONS. (CHEMISTRY)
THIRD SEMESTER
PD 213A: PDP

COURSE OUTCOME

1. This module will also help at course group discussions and interview skills to enable employability and professional fit.
2. Student will able to self-development through good inter-personal skills for effective social communication

1.

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	2	-	-	1	-	2	1	1	1
CO2	2	2	1	-	1	-	1	2	1	-
CO3	1	3	-	-	-	-	1	1	-	2

B.SC. HONS. (CHEMISTRY)

FOURTH SEMESTER BCH 223: PHYSICAL CHEMISTRY-IV

COURSE OUTCOMES:

Students will gain an understanding of:

1. The relationship between microscopic properties of molecules with macroscopic thermodynamic observables
2. The differences between classical and quantum mechanics
3. The fundamentals of nuclear decay.
4. Students will estimate equilibrium conversion in reversible reactions at given pressure and temperature following rigorous thermodynamic method

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	3	1	1	1	-	2	2	1	1
CO2	1	3	1	-	1	-	1	2	2	1
CO3	1	3	-	1	-	-	1	2	-	2

B.SC. HONS. (CHEMISTRY) FOURTH SEMESTER BCH 226: ANALYTICAL CHEMISTRY-III

COURSE OUTCOMES:

1. The various topics of the syllabus are grouped under different units in order to bring forth the importance of academic and laboratory skills for the undergraduate students.
2. From this syllabus class will be able to understand about the chemistry of d-block elements with lanthanides and their properties.
3. With this syllabus class will be to know Introduction of solvent, halogen family and inter-halogen compounds

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	2	-	1	2	2	2	1	1
CO2	1	3	1	-	1	3	1	2	1	2
CO3	2	3	-	1	1	-	1	2	2	-

B.SC. HONS. (CHEMISTRY)
FOURTH SEMESTER

BCH 225: ORGANIC CHEMISTRY-III

COURSE OUTCOMES:

4. The various topics of the syllabus are grouped under different units in order to bring forth the importance of academic and laboratory skills for the undergraduate students.
5. From this syllabus class will be able to understand about the chemistry of d-block elements with lanthanides and their properties.
6. With this syllabus class will be to know Introduction of solvent, halogen family and inter-halogen compounds

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	2	-	1	2	2	2	2	1
CO2	2	3	1	-	1	2	1	2	1	2
CO3	1	3	1	-	-	-	1	2	2	-

B.SC. HONS. (CHEMISTRY)
FOURTH SEMESTER
BA- 264A: MANAGERIAL SKILLS

COURSE OUTCOMES:

1. Manage the selection and initiation of individual projects and of portfolios of projects in the enterprise.
2. Demonstrate effective project execution and control techniques that result in successful projects

Conflict Management - Types of conflicts and Conflict Management, Coping strategies and Conflict Management, Conflict Management Styles

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	2	-	1	2	2	2	2	1
CO2	1	3	1	-	1	2	1	2	1	2
CO3	1	3	1	-	-	-	1	2	2	-

B.SC. HONS. (CHEMISTRY)
FOURTH SEMESTER
BMA-241: ELEMENTARY MATHEMATICS-II

COURSE OUTCOMES:

1. Apply mathematical concepts and principles to perform computations
2. Create, use and analyze graphical representations of mathematical relationships

1.

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	2	-	1	2	2	2	2	1
CO2	2	3	1	-	1	2	1	2	1	2
CO3	1	3	1	-		-	1	2	2	-

B.SC. HONS. (CHEMISTRY) FOURTH SEMESTER
BPH-224: ELEMENT OF MODERN PHYSICS

COURSE OUTCOMES:

1. Demonstrated ability to solve relativity of space and time problems Demonstrated ability to solve relativistic mass, energy, and momentum problems.
2. Demonstrated ability to solve problems involving the quantization of mass, charge, light, and energy including Avogadro's number, black-body radiation, photoelectric effect, and Compton scattering.

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	2	-	1	2	2	2	2	1
CO2	1	3	1	-	1	2	1	2	1	2
CO3	1	3	1	-	-	-	1	2	2	-

BCH 263: INORGANIC CHEMISTRY-III LAB

B.SC. HONS. (CHEMISTRY)

FIFTH SEMESTER

BCH 324: INORGANIC CHEMISTRY-IV

COURSE OUTCOMES:

1. The students will be able to explain the fundamental concepts in coordination chemistry of transition metals.
2. The Students should be familiar with the basic knowledge of the non-aqueous solutions and applications of non-aqueous solvents in analytical chemistry.
3. The students will develop the ability of effective solving practical problem of analytical chemistry of non-aqueous solutions.
4. Students will be able to describe different quantitative methods of analysis of organic and inorganic substances.

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POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	2	-	-	1	1	-	2	1	-
CO2	2	1	-	-	1	1	1	3	-	2
CO3	1	3	1	--	-	1	-	1	-	1

B.SC. HONS. (CHEMISTRY)
FIFTH SEMESTER
BCH 312: ORGANIC CHEMISTRY-IV

COURSE OUTCOMES:

1. To know the complete detailed structure of the organic Compounds.
2. Able to explain the relationship between starting materials, reagents and products arising from variety of reactions
3. To understand the way in which bonds are made and broken to bring about product formation in these reactions (that is, the reaction mechanism)

The effect of structural variations on reactivity (rate or position of equilibrium) in these reactions.

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	1	-	-	-	2	2	1	-
2CO2	2	1	2	1	-	1	2	1	1	1
CO3	1	3	1	-	1	-	1	2	-	2

B.SC. HONS. (CHEMISTRY)
FIFTH SEMESTER
BCH 314: PHYSICAL CHEMISTRY-V

COURSE OUTCOMES:

1. Relate the concepts of quantum chemistry and its application
2. Interrelate the study of light to the nature of the atom
3. Correlate the atomic structure of an element to its physical and chemical properties.
4. Understand the concept of photochemistry and its application in day to day life. Begin to relate the principles learned in chemistry to your chosen area of study.

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	3	-	-	1	-	2	2	1	1
CO2	2	3	1	-	1	-	1	2	1	-
CO3	1	3	-	-	-	-	1	2	-	-

B.SC. HONS. (CHEMISTRY)
FIFTH SEMESTER
BCH 315: ANALYTICAL CHEMISTRY-I

COURSE OUTCOMES

1. Students should be able to calculate SS (sum of square d deviations) variance, and standard deviation for a sample and for a population
2. Students should understand that a z-score provides a precise description of a location in a distribution.
3. Students should be able to transform X values into z-scores, and transform zscores into X values.

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	-	-	1	1	2	1	-	1
CO2	2	3	1	-	1	-	1	2	1	-
CO3	1	3	-	-	-	1	1	2	-	1

COURSE OUTCOMES:

1. Describe the relationship between the lower and upper critical solution temperature. How it changes?
2. Describe how thermodynamics properties such as entropy, enthalpy and free energy changes on mixing of polymer solution.
Study the different polymers (Natural and synthetic) present in this world.

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POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	-	-	1	1	2	2	1	1
CO2	2	3	1	-	1	-	1	2	1	-
CO3	1	3	-	-	-	-	1	2	-	-

**B.SC (HONS)
CHEMISTRY SIXTH
SEMESTER
BCH 327: FUEL CHEMISTRY**

L-4, T-0 P-0

Credits –4

Max Marks:

75 FUEL CHEMISTRY (DEPARTMENTAL ELECTIVE)

SUBJECT CODE: BCH-327

COURSE OUTCOMES:

Students should know following aspects after completion of course:

1. Energy use and the chemical processing aspects of energy production;
2. the chemical processes of fuel refining, conversion and utilization, including processes that can control air pollution;
3. the selection of equipment for efficient utilization of fuels and upgrading of fuels to maximize energy conversion and minimize the environmental impact of fuel utilization;
4. Applications of materials for purification of air and water;
5. Use of lubricants in different machines in industries.

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	3	2	-	1	2	2	2	2	1
CO2	1	3	1	-	1	2	1	2	1	2
CO3	1	3	1	-	-	-	1	2	2	-

Semester: I

(2021-22)

INORGANIC CHEMISTRY-I: (MCH-120)

Course Outcomes:

1. Identify the structure and bonding aspects of simple organometallic compounds
2. Apply different electron counting rules to predict the shape/geometry of low and high unclarity metal carbonyl clusters Identify the different types of organometallic reactions
3. Apply the above concepts to explain different catalytic reactions.
4. To know about the bioinorganic compounds, trace elements, and essential human required compounds

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	-	-	-	-	3	2	-	2
CO4	1	-	-	3	1	-	2	3	1	2

PRACTICAL INORGANIC CHEMISTRY-I: (MCH-170)

Course Outcomes:

1. The students have the detailed knowledge of synthesis of different inorganic compound
2. Students will learn error analysis, statistical data analysis, volumetric analysis, chromatography, flame photometry.
3. Students will be capable of characterizing Organic compounds.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	-	-	-	-	3	2	-	2

ORGANIC CHEMISTRY-I: (MCH-111)

Course Outcomes:

1. Draw all the stereoisomers of organic compounds, and recognize diastereomers, enantiomers, meso compounds and centres of symmetry
2. Calculate optical purity and enantiomeric excess, Discuss the relative stability of conformational isomers of cyclohexanes and related compounds.
3. Recognise and discuss the stereoisomers of chiral compounds that do not contain a stereogenic carbon centre and assign the configuration of the stereoisomers.
4. To learn the involvement of reactive intermediates and understand their structure and reactivity through various organic reactions.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	-	2	2	1	1	1
CO2	1	2	1	-	-	2	3	2	1	2
CO3	1	2	-	-	-	2	3	3	2	2
CO4	2	2	2	-	-	2	3	3	2	2

PRACTICAL ORGANIC CHEMISTRY-I: (MCH-161)

Course Objectives:

1. Students will get acquainted with the unifying principles of spectroscopy.
2. Students will learn atomic absorption spectroscopy, its basic principle, instrumentation and applications.

Course Outcomes:

1. Study detailed knowledge of analytical ore analysis of different element, quantitative organic compound analysis and also have the spectroscopic determination method.
2. Learn error analysis, statistical data analysis, volumetric analysis, chromatography, flame photometry.
3. Capable of synthesizing Organic compounds.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	-	2	2	1	1	1
CO2	1	2	1	-	-	2	3	2	1	2
CO3	1	2	-	-	-	2	3	3	2	2

PHYSICAL CHEMISTRY-I: (MCH-112)

Course Objectives:

1. Recognize the most significant and elementary solutions of Schrodinger equation in molecular quantum mechanics.
2. Differential equations, partial differential equations, series solutions and special functions, linear vector spaces, transformations of coordinate matrix, representation of operators, eigen value problem.

Course Outcomes:

1. Know about the elementary principles of quantum mechanics with particle in 1D box.
2. You understand the electronic structure of atoms and their periodicity.
3. Know about the electronic structure of molecules and chemical bonding.
4. You have a basic understanding of chemical structure determination.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	3	-	1	-	2	1	1	1
CO2	3	2	2	-	1	-	3	-	1	2
CO3	1	2	2	-	-	-	3	2	-	2
CO4	-	2	2		-	-	2	2	2	2

PRACTICAL PHYSICAL CHEMISTRY-I: (MCH-162)

Course Objectives

1. Students will get acquainted with the unifying principles of conductometry, potentiometry and chemical kinetics.

Course Outcomes:

1. The students have the detailed knowledge of analytical ore analysis of different element,
2. Students will learn error analysis, statistical data analysis, volumetric analysis, chromatography, flame photometry.
3. Students will be capable of understanding the principle of potentiometry and conductometry.

1. .

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	-	2	2	1	1	1
CO2	1	2	1	-	-	2	3	2	1	2
CO3	1	2	2	-	-	2	3	3	2	3

SEMESTER II

INORGANIC CHEMISTRY-II: (MCH-114)

Course Objectives:

1. Apply the concept of linear combination of atomic orbitals to hybridization and directed bonding in polyatomic molecules.
2. Solve the real-world problem using advanced numerical programs through Gaussian orbitals.
3. Show that molecular symmetry operations form a group and can be characterized by fundamental representations of groups known as irreducible

Course Outcomes:

1. Analyze point group theory to the study of electrical, optical and magnetic properties and selection rules for absorption.
2. Apply time independent perturbation theory to complex problems of molecular energy levels in the presence of external electric and magnetic fields.
3. Determine the symmetry operations of any small and medium-sized molecule.
4. Explain various symmetry elements and operations of different molecules

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	-	3	-	-	-	-	2	3	1	1
CO2	-	2	1	-	1	-	3	2	1	2
CO3	-	3	-	-	1	-	3	3	3	2
CO4	-	3	-	-	1	-	3	3	3	2

PRACTICAL INORGANIC CHEMISTRY-II: (MCH-164)

Course Objectives

1. The objective of this course is to get the knowledge of analysis of various mixture of inorganic salts.

Course Outcomes:

1. The students have the detailed knowledge of qualitative analysis of mixture of inorganic salts,
2. Students will learn about the titration, volumetric analysis and chromatography.
3. Analyse the various inorganic mixtures.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	-	2	2	1	1	1
CO2	1	2	1	1	1	2	3	2	1	1
CO3	1	2	1	1	1	1	2	2	1	1

ORGANIC CHEMISTRY-II: (MCH-115)

Course Objectives:

1. The course aims to improve a student's understanding of fundamental organic reactions and to add further transformations and principles to their knowledge base.
2. They will encounter anion, radical, pericyclic and organometallic mediated processes, gaining new insights into the factors governing the mechanistic, stereo-chemical and region-chemical course of such reactions.
3. Throughout the course the usefulness of the chemistry discussed will be highlighted through applications.

Course Outcomes:

1. Delineate the mechanistic and stereochemical course of some sophisticated cascade.
2. Can learn different reducing and other reagents with stereoselectivity
3. Can describe different approaches to the formation of carbanions, discuss their structures, stabilities/reactivities and applications in synthesis
4. Radical reactions and appreciate their value in target oriented synthesis.

POs Courses	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	-	-	-	-	3	2	-	2
CO4	1	1	1	-	1	1	-	1	2	3

PRACTICAL ORGANIC CHEMISTRY-II: (MCH-165)

Course Objectives

1. The objective of this course is to understand the basic principle of organic synthesis.

Course Outcomes:

1. Study about the different functional groups.
2. Learn the basic principle of qualitative analysis.
3. Synthesize the various organic compounds.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	2	2	1	-	1	-	3	-	1	1
CO3	2	1	1	-	1	-	2	1	1	1

PHYSICAL CHEMISTRY-II: (MCH-116)

Course Objectives:

1. The learners should be able to apply principles and laws of equilibrium thermodynamics to multicomponent systems.
2. Can use spectroscopic data to calculate thermodynamic properties of ideal gases, real gases, solids and metals using the principles and techniques of statistical thermodynamics.
3. The learners can to apply elementary laws of chemical kinetics and analyze reaction mechanisms and changes in transport properties of chemical reactions and collision processes.

Course Outcomes:

1. Understand and calculate change in thermodynamic properties, equilibrium constants, partial molar quantities, chemical potential.
2. Apply phase rule and, draw phase diagrams for one, and two component systems, identify the dependency of temperature and pressure on phase transitions.
3. Calculate the absolute value of thermodynamic quantities (U, H, S, A, G) and equilibrium constant (K) from spectroscopic data.
4. Predict heat capacity (C_v , C_p) of an ideal gas of linear and non-linear molecules from the number of degrees of freedom, rotational and vibrational wave numbers.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	2	1	2	2	-	3	-	1	2
CO3	1	2	-	-	-	-	3	2	-	2
CO4	2	2	2	2	3	1	2	2	3	2

PRACTICAL PHYSICAL CHEMISTRY-II: (MCH-166)

Course Objectives

1. Students will get acquainted with the unifying principles of conductometry, potentiometry and chemical kinetics.

Course Outcomes:

1. The students have the detailed knowledge of chemical kinetics and electrochemistry.
2. Students will learn error analysis, statistical data analysis, volumetric analysis, chromatography, flame photometry.
3. Students will be capable of understanding the principle of potentiometry and conductometry.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	2	1	2	2	-	3	-	1	2
CO3	1	2	-	-	-	-	3	2	-	2

ANALYTICAL CHEMISTRY-I (MCH-117)

Course Objectives:

1. The learners should be able to apply the conceptual understanding of the principles and implementation modes of several analytical instruments to chemical systems.
2. To know that mixtures are composed of constituents which are not combined
3. To apply methods of distillation, sublimation, chromatography, filtration (including buchner filtration), evaporation, decantation, using magnetism, sieving and skimming to separate mixtures.
4. To understand the terms filtrate, residue, filtration, sediment, decant, distil, distillate, chromatogram and solventfront.

Course Outcomes:

1. Solve the problems based on various analytical concepts
2. Design experiments with improved sample preparation.
3. Understand new measurement procedures and tools, Quantify analytes with proper data handling and analysis.
4. Describe qualitatively and model quantitatively the operation and design of economically viable processes

POs Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	-	-	-	-	3	2	-	2
CO4	-	3	3	-	-	1	2	3	2	2

PRACTICAL ANALYTICAL CHEMISTRY-I (MCH-167)

Course Objectives:

1. Students will get acquainted with the analytical techniques of and characterization of inorganic compounds.

Course Outcomes:

1. The students have the detailed knowledge of synthesis of different inorganic compound
2. Students will learn error analysis, statistical data analysis, volumetric analysis, chromatography, flame photometry.
3. Students will be capable of characterizing Inorganic compounds.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	2	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	-	-	-	-	3	2	-	2

SEMESTER-III

HETEROCYCLIC COMPOUNDS (MCH-212)

Course Objectives:

1. Rationalization of the reactivity of heteroaromatic compounds.
2. Knowledge of methods to prepare some heterocyclic compounds with Five and Six members, fused rings and heterocyclic compounds two or more heteroatom's.
3. Improving the students' knowledge of the methods of preparation followed by the Reaction Mechanism.
4. Application for the Synthesis and Design of some biologically active compounds derived from heterocyclic compounds.

Course Outcomes:

1. Be familiar with the structures of important classes of heterocyclic aromatic organic compounds.
2. Classify simple heterocyclic aromatic compounds as electron deficient or electron rich and explain their reactivity based on these properties.
3. Know how selected organometallic reactions can be applied in heterocyclic chemistry.
4. Explain on a mechanistic level, reactions and synthesis of important electron deficient nitrogen containing heterocycles.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	-	-	-	-	3	2	-	2
CO4	1	-	-	2	1	1	1	2	2	2

Organic Chemistry –III Practical: (MCH-261)

Course Objectives:

1. Students will get acquainted with the unifying principles of spectroscopy.
2. Students will learn atomic absorption spectroscopy, its basic principle, instrumentation and applications.

Course Outcomes:

1. The students have the detailed knowledge of analytical ore analysis of different element, quantitative organic compound analysis and also have the spectroscopic determination method.
2. Students will learn error analysis, statistical data analysis, volumetric analysis, chromatography, flame photometry.
3. Students will be capable of synthesizing Organic compounds.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	-	1	-	-	2	2	1	1

PHYSICAL CHEMISTRY-III (MCH-213)

Course objectives:

1. Student is able to determine the (most important) quantum states of a given material (atoms, small molecules).
2. Student is able to determine which quantum state(s) belong(s) to the ground state.
3. Student can rationalize which transitions between quantum states as a result of an absorption, emission or scattering event have a more than zero probability of taking place.

Course Outcomes:

1. Discuss the basics of Spectroscopy.
2. Study the principles of NMR, UV, Raman and Mass spectroscopy.
3. Able to characterize and interpret various organic compounds through IR NMR spectroscopy,.
4. Explain about elemental analysis technique, working basic and using of elemental analysis device.

POs Courses	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	2	-	-	-	2	2	2	2
CO4	-	1	1	1	-	1	2	2	1	2

PRACTICAL PHYSICAL CHEMISTRY-III: (MCH-263)

Course Objectives

1. Students will get acquainted with the unifying principles of conductometry, potentiometry and chemical kinetics.

Course Outcomes:

1. The students have the detailed knowledge of chemical kinetics and electrochemistry.
2. Students will learn error analysis, statistical data analysis, volumetric analysis, chromatography, flame photometry.
3. Students will be capable of understanding the principle of potentiometry and conductometry.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	1	1	1	1	-	2	-	1	1
CO3	1	2	1	-	-	-	2	1	2	2

Nuclear & Radio Chemistry (MCH-219)

Course Objectives:

1. Improve their knowledge of the basic information of Radiation and Nuclear chemistry; requirements, methods of preparation, uses of radio-elements series, nuclear models, nuclear properties, Mass energy, relationships, nuclear reactions, rates of radioactive decay, interaction of radiation with matter.
2. Improve their knowledge of instrumentation and Introduction to health – physical applications in nuclear and radiochemistry.

Course Outcomes:

1. Know the significance of Radio Chemical Techniques
2. Apply the basic principle and methodology of Radio Chemical Techniques
3. Understand the applications of Radio Chemical Techniques.
4. Analyze and calculate the half life and decay rates of various radioactive elements

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	3	2	2	2	1	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	2	2	2	2	2	2	2	2
CO4	1	1	2	1	1	1	1	2	2	2

Bioinorganic & Environmental Chemistry (MCH-220)

Course Objectives:

1. Students will demonstrate the ability to plan and execute experiments that demonstrate the use and understanding of modern instruments and appropriate use of Bioinorganic Chemistry.
2. Students will demonstrate their ability to communicate effectively about environmental chemistry, demonstrating the ability to create an awareness about environment.
3. Students will develop a sense of community responsibility by becoming aware of scientific issues in the larger social context.

Course Outcomes:

1. Acquire broad knowledge of the field of Environmental Chemistry including basic principles, target organ toxicity and the toxicity of a select group of chemical compounds.
2. Use technical and analytical skills to quantify the level and effects of Bioinorganic Chemistry.
3. Understand relationships between chemical exposure and effects on physiological system
4. Design strategies for study of harmful effects of different pollutants.

POs Courses	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	2	3	-	2	1	1	1
CO2	3	2	1	2	2	-	3	-	1	2
CO3	2	2	2	3	3	2	3	2	2	2
CO4	2	2	2	3	3	2	3	2	2	2

Inorganic Chemistry –III Practical: (MCH-260)

Course Objectives

1. Students will get acquainted with the unifying principles of synthesis and characterization of metal complexes.

Course Outcomes:

1. The students have the detailed knowledge of chemical kinetics and electrochemistry.
2. Students will learn error analysis, statistical data analysis, volumetric analysis, chromatography, flame photometry.
3. Students will be capable of understanding the principle of potentiometry and conductometry.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	2	3	-	2	1	1	1
CO2	3	2	1	2	2	-	3	-	1	2
CO3	2	2	2	1	2	2	1	1	2	2

Semester-IV

ORGANO-TRANSITION METAL CHEMISTRY: MCH-221

Course Objectives:

The objective of this course is that students will gain the detailed knowledge of synthesis, bonding, Reaction and application of transition metals compounds in organometallic chemistry.

Course Outcome:

1. The students can gain the knowledge of synthesis of alkyl and aryl transition metals
2. Students can learn the synthesis, bonding and reactions of transition metal complexes.
3. Students can utilize the knowledge of different types of carbene complexes.
4. Students can learn the application of transition metal organometallic compounds as catalysts.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	-	2	2	1	1	1
CO2	1	2	1	-	-	2	3	2	1	2
CO3	1	2	-	-	-	2	3	3	2	2
CO4	2	2	2	-	-	2	3	3	2	2

ELECTRO ANALYTICAL CHEMISTRY: MCH-222

Course Objectives:

The objective of this course is that students will gain the detailed knowledge of electrochemical reaction, stability, polarography and their applications along with different types of voltammetry.

Course Outcome:

1. To understand the detailed concept of electrochemical reactions and different electrodes.
2. To know about the principle of polarography and their applications.
3. To study the different types of polarography and coulometry.
4. To know about various techniques of voltammetry and their application in inorganic system.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	-	-	-	-	3	2	-	2
CO4	1	-	-	3	1	-	2	3	1	2

MEDICAL ASPECTS OF INORGANIC CHEMISTRY: MCH-223

Course Objectives:

1. To emphasize the importance of inorganic entities in pharmaceuticals
2. To provide knowledge about important inorganic pharmaceuticals in pharmacopoeia regarding their preparation, quality standard and pharmaceutical uses
3. To highlight the domain of radiopharmaceuticals used in the diagnostics and therapy
4. To describe typical therapeutic classes and inorganic agents associated with them

Course Outcomes:

1. Explain the sources of impurities and methods to determine the impurities in inorganic pharmaceuticals
2. Explain the method of preparation, assay, properties, and medicinal uses of acids, bases, buffers, extra and intracellular electrolytes.
3. Explain the method of preparation, assay, properties, and medicinal uses of dental products.
4. Explain the method of preparation, assay, properties, and medicinal uses of astringent, poison and antidote.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	1	-	3	2	-	2	1	1	1
CO2	1	2	1	-	1	-	3	-	1	2
CO3	1	2	-	2	-	2	-	2	2	2
CO4	1	1	2	1	1	1	1	2	-	2

Industrial Chemistry: MCH-224

Course Objective:

The aim of this course is that the students will learn the essential principles used in industrial pollution abatement and understand important issues in industrial pollution abatement and pertinent environmental legislations.

Course Outcomes:

1. Understand the different types of wastes generated in an industry, their effects on living and non-living things.
2. Understand environmental regulatory legislations and standards and climate changes.
3. Understand about the quantification and analysis of wastewater and treatment.
4. Understand about analysis and quantification of hazardous and nonhazardous solid waste.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	1	1	-	2	2	1	2	1	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	-	2	-	2	3	2	2	2
CO4	1	-	2	1	1	-	1	2	2	2

Inorganic Chemistry IV-Practical: MCH-271

Course Objectives:

The objective of this course is that students can get the practical knowledge of atomic absorption spectrophotometry, flame photometry, polarography and amperometric titrations.

Course Outcome:

1. The students can learn the experimental knowledge of metal ion estimation by atomic absorption spectrophotometry.
 2. To learn the polarographic determination of metals.
 3. To understand the amperometric titration for mixtures.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	-	-	-	-	3	2	-	2

Inorganic Chemistry V-Practical: MCH-272

Course Objectives:

The laboratory component of the course will aim to develop skills in the handling of air-sensitive compounds and the purification of compounds using chromatographic techniques.

Course Outcomes:

1. The students have the detailed knowledge of analytical or analysis of different element, quantitative analysis
2. Learn error analysis, statistical data analysis, volumetric analysis, chromatography, flame photometry.
3. Capable of synthesizing Inorganic compounds.

PO s Co s	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	2	1	-	-	1	-	2	1	1	1
CO2	3	2	1	-	1	-	3	-	1	2
CO3	1	2	-	-	-	-	3	2	-	2

S.No.	Course details
1.	Research work
2.	Seminar
3.	Evaluation by Research committee
4.	Thesis writing
5.	Research work by taking 260 credit hours

School of Basic Science

B. SC. (Hons.) PHYSICS (2021-22 batch Onwards)

**School of Basic and Applied Sciences
B.Sc. / Physics**

**LINGAYA'S VIDYAPEETH
BACHELOR OF SCIENCE**

PROGRAMME EDUCATIONAL OBJECTIVES

PEO1: To develop strong base in Physics and its applications for competing in technologically

Advancing era.

PEO2: To produce young skilled minds in research, analysis and interpretation of results.

PEO3: To prepare the students in order to compete for placement in the field of research and

Teaching.

PEO4: To offer a wide range of experience in research methods & data analysis to meet the

Industrial needs.

PEO5: Students can perform interdisciplinary research.

Mapping of PEOs with Mission Statements

PEO Statements	School Mission 1	School Mission 2	School Mission 3	School Mission 4
PEO1:	2	2	2	3
PEO2:	2	3	1	3
PEO3:	1	3	2	3
PEO4:	2	2	3	1
PEO5:	3	1	2	1

PROGRAMME OUTCOMES

On completion of program, the graduates will

PO1: Apply the knowledge of physics fundamentals with the help of mathematics to the

solution of physical problems.

PO2: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO3: Excel in research related to physics and materials characterization.

PO4: Model the behavior of various systems through computation.

Program Specific Outcomes:

PSO1: Understand the basic concepts of Mechanics, Electricity and Magnetism, Waves, Electromagnetic Theory, Thermodynamics, Quantum Mechanics and Statistical Physics, Condensed Matter Physics, Nuclear Physics, Material Science, Atomic and Molecular Physics, Particle Physics, Physics of Resonance Techniques.

PSO2: Perform procedures/experiments as per laboratory standards.

PSO3: Understand the applications of physics in real world problems.

PSO4: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Mapping of Program Outcome with Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	1	2	2	3	1
PO2	2	1	3	2	2
PO3	3	2	2	1	3
PO4	1	3	3	2	2
PSO 1	1	2	2	3	1
PSO 2	2	1	3	2	2
PSO 3	3	2	2	1	3
PSO 4	1	3	3	2	2

SEMESTER-I

BPH-120: MATHEMATICAL PHYSICS

L-3, T-1 P-0

Credits-4

Max Marks: 100

Objective- The emphasis of course is on applications in solving problems of interest to physicists. The students are to be examined entirely based on problems, seen and unseen.

Course Outcome

CO1: In this course the students should learn to master the tools from vector and calculus analysis that are important prerequisites for other physics courses like electrodynamics.

CO2: This module will teach how to solve differential equations and apply them in physical world.

CO3: The students will learn to formulate specific physics problems through mathematical models of this kind, to master various important analytical and numerical methods to solve such models.

CO4: Students will learn to give physical interpretations of the solutions of various mathematical models.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	3	-	-	3	2	3	1
CO2	2	3	1	-	1	2	1	-
CO3	3	3	-	-	1	2	-	-
CO4	2	3	-	-	2	1	-	-

BPH-170-MATHEMATICAL PHYSICS LAB

Course outcomes:

CO1: Students will demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics.

CO2: Students will demonstrate knowledge of classical mechanics, electromagnetism, quantum mechanics, and thermal physics, and be able to apply this knowledge to analyze a variety of physical phenomena.

CO3: Students will show that they have learned laboratory skills, enabling them to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions.

CO4: Students will be capable of oral and written scientific communication and will prove that they can think critically and work independently.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	3	-	-	2	2	1	1
CO2	1	3	1	1	1	2	1	3
CO3	1	3	-	-	1	2	-	1
CO4	2	3	1	1	2	1	-	-

BPH-122:ELECTRICITY AND MAGNETISM

Course outcomes:

CO1: The use of Coulomb's law and Gauss' law for the electrostatic force

CO2: The relationship between electrostatic field and electrostatic potential

CO3: The use of the Lorentz force law for the magnetic force

CO4: The use of Ampere's law to calculate magnetic fields.

. Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Maximum Power Transfer theorem.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	3	1	1	2	2	1	1
CO2	2	3	1	-	1	2	1	-
CO3	1	3	-	-	1	2	-	1
CO4	2	3	-	2	2	1	2	-

BPH-172: ELECTRICITY AND MAGNETISM LAB

L-0, T-0 P-4

Credits–2

Max Marks: 100

Objective: The aim of this Lab is skill the students with various experiments involved in mechanics.

Course outcomes:

CO1: Students will learn about electrical measurements.

CO2: understand the concept of parallel and series connection.

CO3: determine the magnetic field strength of a solenoid.

CO4: master the various theorems of simplifying a circuit.

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POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	3	-	1	2	2	1	1
CO2	1	3	1	-	1	2	1	1
CO3	1	3	-	3	1	2	2	-
CO4	2	3	-	1	2	1	-	-

BPH-124: MECHANICS

Course outcomes:

CO1: Students will learn about relative motion & Inertial and non-inertial reference frames.

CO2: Parameters defining the motion of mechanical systems and their degrees of freedom will also be learned by the students.

CO3: understand the study of the interaction of forces between solids in mechanical systems.

CO4: Learn about centre of mass and inertia tensor of mechanical systems.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	3	1	-	2	2	1	1
CO2	2	3	1	-	1	2	1	-
CO3	2	1	3	3	1	2	-	-
CO4	2	3	-	-	2	1	-	2

BPH-174:MECHANICS LAB

Course outcomes:

CO1: Students will learn about measuring techniques.

CO2: understand the elasticity concept.

CO3: determine the value of acceleration due to gravity.

CO4: master the techniques to calculate various mechanical parameters.

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POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	3	1	1	2	2	1	1
CO2	2	3	1	-	1	1	2	-
CO3	1	3	3	-	1	2	-	-
CO4	2	3	-	3	2	1	-	1

SEMESTR-II
BPH-123: WAVE AND OPTICS

Course outcomes:

CO1: Solve for the solutions and describe the behavior of a damped and driven harmonic oscillator in both time and frequency domains.

CO2: Describe the behavior of waves at interfaces (reflection, transmission, impedance) and their behavior in dissipative media (damping).

CO3: Construct travelling and standing solutions to the wave equation.

CO4: Understand and implement Fourier series.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	3	-	1	2	2	1	1
CO2	2	3	1	1	1	3	1	-
CO3	1	3	1	2	1	2	-	-
CO4	2	3	-	3	2	1	-	-

BPH-173:WAVE AND OPTICS LAB

Course outcomes:

CO1: Students will learn about optical measurements.

CO2: understand the concept diffraction through prism.

CO3: determine the wavelength of sodium light.

CO4: understand the concept of diffraction of light practically.

>

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	3	1	1	2	2	1	1
CO2	2	3	1	-	1	1	2	-
CO3	1	3	3	-	1	2	-	-
CO4	2	3	-	3	2	1	-	1

BPH-125:THERMAL PHYSICS

Course outcomes:

CO1: Identify and describe the statistical nature of concepts and laws in thermodynamics, in particular: entropy, temperature, chemical potential, Free energies, partition functions.

CO2: Use the statistical physics methods, such as Boltzmann distribution, Gibbs distribution, Fermi-Dirac and Bose-Einstein distributions to solve problems in some physical systems.

CO3: Apply the concepts and principles of black-body radiation to analyze radiation phenomena in thermodynamic systems.

CO4: Apply the concepts and laws of thermodynamics to solve problems in thermodynamic systems such as gases, heat engines and refrigerators etc.

➤ Thermal Physics, A. Kumar and S.P. Taneja, 2014, R. Chand Publications.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	3	-	2	2	2	1	1
CO2	1	3	1	-	1	2	1	-
CO3	1	3	3	2	1	2	2	-
CO4	2	3	-	-	2	1	-	2

BPH-175: THERMAL PHYSICS LAB

Course outcomes:

CO1: Students will learn about thermal measurements.

CO2: understand the concept thermometer and variable resistance.

CO3: determination of thermal conductivity of the materials.

CO4: understand the thermodynamics of materials.

1. COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	3	1	1	2	2	1	1
CO2	3	3	1	-	1	2	1	-
CO3	1	3	-	1	1	2	2	2
CO4	2	3	-	1	2	1	-	-

SEMESTER-III

BPH-221: DIGITAL SYSTEM AND APPLICATION

Course outcomes:-

CO1: Create the appropriate truth table from a description of a combinational logic function.

CO2: Describe the operation and timing constraints for latches and registers.

CO3: Create a state transition diagram from a description of a sequential logic function and then convert the diagram into an implementation of a finite-state machine with the appropriate combinational and sequential components.

CO4: Describe the operation and timing constraints for latches and registers.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	3	-	-	2	2	1	1
CO2	2	3	2	2	1	-	1	2
CO3	2	1	1	-	1	2	-	-
CO4	2	3	-	1	2	3	2	1

BPH-271: DIGITAL SYSTEM AND APPLICATION LAB

Course outcomes:-

CO1: Create the appropriate truth table from a description of a combinational logic function.

CO2: Describe the operation and timing constraints for latches and registers.

CO3: Create a state transition diagram from a description of a sequential logic function and then convert the diagram into an implementation of a finite-state machine with the appropriate combinational and sequential components.

CO4: Describe the operation and timing constraints for latches and registers.

1. To measure (a) Voltage, and (b) Time period of a periodic waveform using CRO.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	2	-	1	2	3	1	1
CO2	2	2	1	-	1	2	1	-
CO3	1	1	-	1	1	2	-	-
CO4	2	1	-	-	2	3	-	-

BPH-223: APPLIED OPTICS

Course outcomes:

CO1: The student should have had knowledge on the different types of lasers.

CO2: The student should have understood the basics of nonlinear optics.

CO3: students will understand interference.

CO4: Students will learn about working of lasers.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	3	-	2	2	2	1	1
CO2	1	-	1	-	1	-	1	-
CO3	1	3	-	3	1	2	-	-
CO4	2	-	-	-	2	1	2	-

BPH-224: ELEMENTS OF MODERN PHYSICS

Course outcomes:

CO1: Demonstrated ability to solve relativity of space and time problems.

CO2: Demonstrated ability to solve relativistic mass, energy, and momentum problems.

CO3: Demonstrated ability to solve problems involving the quantization of mass, charge, light, and energy including Avogadro's number, black-body radiation, photoelectric effect, and Compton scattering.

CO4: Described various models of the atom and explained why each was proposed and rejected except for the quantum model.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	3	-	2	2	2	1	1
CO2	2	-	1	-	3	2	1	-
CO3	1	2	-	1	1	2	-	-
CO4	1	3	-	-	2	1	-	-

BPH-225:ANALOG SYSTEM AND APPLICATIONS

Course outcomes:

CO1:students will understand semiconductor physics

CO2:students will know about p-n junction diode

CO3:students will understand the drift velocity concept

CO4:students will understand about transistors

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	2	-	1	2	3	1	1
CO2	2	2	1	-	1	2	1	-
CO3	1	1	-	1	1	2	-	-
CO4	2	1	-	-	2	3	-	-

BPH-274: ELEMENTS OF MODERN PHYSICS LAB

Course outcomes:

CO1: student will learn about photoelectric effect

CO2: understand the work function of materials

CO3: calculate planck's constant

CO4: calculate e/m ratio

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	-	2	2	1	1
CO2	1	3	1	1	1	2	1	-
CO3	1	1	-	-	2	2	-	-
CO4	2	3	-	2	2	1	-	3

BPH-275: ANALOG SYSTEM AND APPLICATION LAB

Course outcomes:

CO1: study of p-n junction diode and light emitting diode

CO2: understand the Zener diode mechanism

CO3: learn about transistors

CO4: study about operational amplifiers

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	3	-	-	2	2	3	3
CO2	1	3	1	-	1	2	1	-
CO3	1	3	3	-	2	2	-	-
CO4	2	3	-	-	2	1	1	-

Semester IV

BPH-226: MATHEMATICAL PHYSICS – III

Course outcomes:

CO1:define and derive convergent and asymptotic series.

CO2:apply techniques of complex analysis, such as contour integrals and analytic continuation, to the study of special functions of mathematical physics.

CO3:calculate approximations to integrals by appropriate saddle point methods.

CO4:define and manipulate the Dirac Delta and other distributions and be able to derive their various properties.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	3	-	-	2	2	1	1
CO2	2	1	1	2	1	2	1	-
CO3	2	3	3	-	1	3	-	-
CO4	2	3	-	-	2	1	-	-

BPH-276:MATHEMATICAL PHYSICS-III LAB

Course outcomes:

CO1: students will learn to solve differential equations.

CO2:students will understand dirac delta functions.

CO3:students will learn to write equations in programs.

CO4:students will understand programming.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	3	-	1	2	2	1	1
CO2	1	2	1	1	1	3	1	-
CO3	1	3	1	-	1	2	-	-
CO4	2	3	-	2	2	1	-	-

BPH-227: QUANTUM MECHANICS AND APPLICATIONS

Course Outcome

CO1: Pinpoint the historical aspects of development of quantum mechanics.

CO2: Understand and explain the differences between classical and quantum mechanics.

CO3: Understand the idea of wave function and the uncertainty relations.

CO4: Solve Schrodinger equation for simple potentials. Identify and relate the eigenvalue problems for energy, momentum, angular momentum, and central potentials explain the idea of spin.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	2	-	2	2	2	1	1
CO2	2	3	1	-	1	2	1	-
CO3	1	2	-	-	1	2	-	-
CO4	3	3	2	-	2	1	-	-

BPH-277-QUANTUM MECHANICS AND APPLICATION LAB

Course outcomes:

CO1: Students will demonstrate proficiency in Quantum Mechanics and related application needed for a proper understanding of physics.

CO2: Students will be able to demonstrate knowledge of Quantum mechanics be able to apply this knowledge to analyze a variety of physical phenomena.

CO3: Students will show that they have learned laboratory skills, enabling them to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions.

CO4: Students will be able to Use C/C++/Scilab for solving the following problems based on Quantum Mechanics like.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	1	3	2	2	3	1	1
CO2	1	2	1	-	1	2	1	-
CO3	1	3	-	2	1	-	-	-
CO4	2	2	3	-	2	1	-	3

BPH-228 : SOLID STATE PHYSICS

Course outcomes:

CO1: Students will be able to account for interatomic forces and bonds and have a basic knowledge of crystal systems and spatial symmetries.

CO2: Students will be able to account for how crystalline materials are studied using diffraction and be able to perform structure determination of simple structures.

CO3: Understand the concept of reciprocal space and significance of Brillouin zones.

CO4: Students will be understanding the fundamental principles of semiconductors, including pn-junctions, and be able to estimate the charge carrier mobility and density.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	2	3	-	2	2	1	1
CO2	1	3	1	1	1	2	1	-
CO3	1	3	2	-	1	3	-	2
CO4	2	2	2	-	2	1	-	-

BPH-278: SOLID STATE PHYSICS LAB

Course outcomes:

CO1: Students will be understanding the practical knowledge of various aspects of magnetism.

CO2: Students will be to calculate the magnetic susceptibility of different magnetic materials.

CO3: Understand the concept of PE loop and Hysteresis loop and difference between these two.

CO4: Students will be able to calculate the resistivity and hall coefficient value.



POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	2	-	2	2	2	1	1
CO2	2	-	1	-	1	2	1	-
CO3	1	3	2	1	1	2	-	-
CO4	2	-	3	-	2	1	-	-

SEMESTER-V

BPH-322: PHYSICS OF DEVICE AND COMMUNICATION

Course outcomes:

CO1: Students will be able to understand the fundamentals of Electronics Device Physics.

CO2: Students will understand the physical principles crucial to the functionality and operation of basic semiconductor devices.

CO3: Students will enrich their knowledge in understanding the linear and non-linear applications of operational amplifiers.

CO4: Students will gain the knowledge of industrial instruments and fundamentals of Electronics.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	2	2	2	1	1
CO2	-	2	1	-	1	2	1	-
CO3	1	3	-	3	1	2	-	2
CO4	2	2	-	-	2	1	-	3

BPH-323: NUCLEAR AND PARTICLE PHYSICS

Course outcomes:

CO1: Understand the fundamental principles and concepts governing classical nuclear and particle physics and have a working knowledge of their application to real-life problems.

CO2: Demonstrate knowledge and understanding of scientific phenomena, facts, laws, definitions, concepts, theories, scientific vocabulary, terminology, conventions.

CO3: Students will understand scientific quantities and their determination, order-of-magnitude estimates, scientific and technological applications as well as their social, economic, and environmental implications.

CO4: Demonstrate comprehension of physical reality through estimation, approximation, and mathematical modeling, and understand how a small number of fundamental physical principles underlie a huge variety of interconnected natural phenomena.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	2	3	-	2	2	3	1
CO2	2	1	1	2	1	3	1	-
CO3	2	2	-	1	1	2	-	3
CO4	3	1	2	-	2	1	-	-

BPH-324:ELECTROMAGNETIC THEORY

Course outcomes:

CO1: study of maxwell's equations

CO2: understanding the EM waves

CO3: learn about wave propagation

CO4: study about polarization of waves

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	3	2	3	2	2	3	3
CO2	1	2	1	1	1	2	1	-
CO3	-	3	1	-	3	2	3	3
CO4	2	1	3	1	2	1	-	1

BPH-374: ELECTROMAGNETIC THEORY LAB

CO1: study of maxwell's equations

CO2: understanding the EM waves

CO3: calculation of specific rotation of polarized light

CO4: study about polarization of waves

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	3	-	-	2	2	3	3
CO2	1	3	1	2	1	2	1	-
CO3	2	3	2	-	3	2	1	2
CO4	2	3	-	2	2	1	-	-

BPH-325: STATISTICAL MECHANICS

Course outcomes:

CO1: study of statistical systems

CO2: understanding the ensembles

CO3: learn about partition function

CO4: study about Gibb's paradox

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	3	3	-	-	2	2	3	3
CO2	1	1	1	1	-	2	1	-
CO3	2	3	2	1	3	3	1	-
CO4	2	2	1	-	2	1	-	-

BPH-375: STATISTICAL MECHANICS LAB

L-0, T-0 P-4

Credits-2

Max Marks: 100

OBJECTIVE: Main objective to study this course is to have a clean understanding of statistical mechanics.

CO1: study of transient behavior of systems

CO2: understanding the equilibrium state

CO3: plot specific heat capacities

CO4: study about velocity distributions

- Maxwell-Boltzmann distribution
- Fermi-Dirac distribution
- Bose-Einstein distribution

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	3	2	1	2	2	3	3
CO2	1	3	1	1	1	2	1	-
CO3	1	3	3	-	3	2	3	-
CO4	2	3	-	-	2	1	-	-

SEMESTER-VI
BPH-326:NANO-MATERIALS & APPLICATION

Course Objectives:

CO1: study of nanomaterials

CO2: understanding the nanostructures.

CO3: learn about physical properties of nanomaterials.

CO4: study about applications of nanomaterials.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	1	-	1	2	2	3	3
CO2	1	3	1	1	1	2	1	-
CO3	1	1	-	2	3	2	2	-
CO4	2	3	3	-	2	1	-	2

BPH-327: BIO-PHYSICS

Course outcomes:

CO1: Study about biological macromolecules, their polymeric structures, and their role.

CO2: Detailed chemical structure of the polymers and their constituent monomers

CO3: Role of covalent and non-covalent bonds and experimental techniques used in Bio-Physics

CO4: Understanding of instrument used for biophysics.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	2	-	2	2	2	1	1
CO2	2	3	1	-	1	2	1	-
CO3	1	2	-	-	1	2	-	-
CO4	3	3	2	-	2	1	-	-

BPH-377: DISSERTATION/PROJECT

Course Objectives:

CO1: learn to write dissertations

CO2: understanding and improving vocabulary

CO3: identifying the topics of research

CO4: learn to make presentations

1.

POs COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	1	2	2	1	3
CO2	1	3	1	2	1	2	1	1
CO3	2	1	1	2	3	1	2	-
CO4	2	3	3	-	2	1	-	2

MASTER OF SCIENCE- PHYSICS

SEMESTER-I

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-110	MATHEMATICAL PHYSICS	3	1	-	4

Course outcomes: After successfully completed course, student will be able to

1. Use complex analysis in solving physical problems.
2. Solve ordinary and partial differential equations of second order that are common in the physical sciences.
3. Use the orthogonal polynomials and other special functions.
4. Use Fourier series and integral transformation.
5. Use the calculus of variations
Use Green functions

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-111	CLASSICAL MECHANICS	3	1	-	4

Course outcomes:After successfully completed course, student will be able to

- 1 Define and understand basic mechanical concepts related to discrete and continuous mechanical systems,
- 2 Describe and understand the vibrations of discrete and continuous mechanical systems,
- 3 Describe and understand planar and spatial motion of a rigid body,
- 4 Describe and understand the motion of a mechanical system using Lagrange-Hamilton formalism

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-112	QUANTUM MECHANICS – I	3	1	-	4
1.	Pinpoint the historical aspects of development of quantum mechanics				
2.	Understand and explain the differences between classical and quantum mechanics				
3.	Understand the idea of wave function				
4.	Understand the uncertainty relations				
5.	Solve Schrodinger equation for simple potentials				
6.	Spot, identify and relate the eigenvalue problems for energy, momentum, angular momentum and central potentials explain the idea of spin				

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-113	ELECTRO-OPTIC EFFECTS IN MATERIALS (EOEM)	3	1	-	4

Course outcomes: Learning Outcomes: Students will have understanding of:

1. Logic circuits, digital systems and microprocessor and their peripheral devices.
2. Operating and designing digital systems
3. How to solve problems in design and/ or implementation of digital

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-114	ELECTRONICS	3	1	-	4

Course outcomes: Learning Outcomes: Students will have understanding of:

4. Logic circuits, digital systems and microprocessor and their peripheral devices.
5. Operating and designing digital systems
6. How to solve problems in design and/ or implementation of digital

SEMESTER-II

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-115	QUANTUM MECHANICS – II	3	1	-	4

Course outcomes: The completion of course will help students to:

1. Develop a knowledge and understanding of the concept that quantum states live in a vector space;
 2. Relate this abstract formulation to wave and matrix mechanics
 3. Develop a knowledge and understanding of perturbation theory, level splitting, and Radiative transitions;
 4. Develop a knowledge and understanding of the relation between conservation laws and symmetries;
- Develop a knowledge and understanding of the role of angular momentum in atomic and nuclear physics;
5. Develop a knowledge and understanding of the scattering matrix and partial wave analysis;
- Solve quantum mechanics problems

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-116	THEORY OF RADIATION & STATISTICAL MECHANICS	3	1	-	4

Course outcomes: On completion of this course a student will be able to:

1. Define and discuss the concepts of microstate and macro state of a model system
2. Define and discuss the concepts and roles of entropy and free energy from the view point of statistical mechanics
3. Define and discuss the Boltzmann distribution and the role of the partition function`
4. Discuss the concept and role of indistinguishability in the theory of gases; know the results expected from classical considerations and when these should be recovered
5. Define the Fermi-Dirac and Bose-Einstein distributions; state where they are applicable; understand how they differ and show when they reduce to the Boltzmann distribution
6. Apply the Bose-Einstein distribution to the calculation of properties of black body radiation

COURSE CODE	COURSE TITLE	L	T	P	CRE DIT S
MPH-117	NUMERICAL METHODS AND COMPUTATIONAL PHYSICS	3	1	-	4

Course outcomes: On completion of this course, students will be able to:

1. Identify modern programming methods and describe the extent and limitations of computational methods in physics
2. Identify and describe the characteristics of various numerical methods
3. Independently program computers using leading-edge tools,
4. Formulate and computationally solve a selection of problems in physics
5. Use the tools, methodologies, language and conventions of physics to test and communicate ideas and explanations.

COURSE CODE	COURSE TITLE	L	T	P	CRE DIT S
MPH-118	ELECTROMAGNETIC THEORY & ELECTRODYNAMICS	3	1	-	4

Course outcomes: The completion of course will help students to:

1. Apply vector calculus to static electric-magnetic fields in different engineering situations.
2. Analyze Maxwell's equation in different forms (differential and integral) and apply them to diverse science problems.
3. Examine the phenomena of wave propagation in different media and its interfaces and in applications of wave engineering.
4. Analyze the nature of electromagnetic wave propagation in guided medium

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-119	ATOMIC & MOLECULAR PHYSICS	3	1	-	4

Course outcomes: Upon successful completion of this course, the students will be able to:

- 1.** Discuss the relativistic corrections for the energy levels of the hydrogen atom and their effect on optical spectra
- 2.** Derive the energy shifts due to these corrections using first order perturbation theory
- 3.** State and explain the key properties of many electron atoms and the importance of the Pauli exclusion principle
- 4.** Explain the observed dependence of atomic spectral lines on externally applied electric and magnetic fields
- 5.** State the formal properties of groups, characters and irreducible representations
- 6.** State and justify the selection rules for various optical spectroscopies in terms of the symmetries of molecular vibrations
- 7.** Apply general considerations of quantum physics to atomic and molecular system; make general orders of magnitude of estimation of physical effects
- 8.** Explain how light interacting with atom and effect of magnetic field on the spectrum.
- 9.** Recognize the general features of Atomic/Molecular spectroscopy and its application in real world

SEMESTER-III

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
MPH-210	SOLID STATE PHYSICS	3	1	-	4

Course outcomes: After successfully completing this course students will be able to:

1. Explain the fundamental concepts of solid state physics such as what types of matter exist and the methods available to determine their structure and properties
2. Outline the physical origins which govern the properties of matter in the solid state
3. Apply the knowledge gained to solve problems in solid state physics using relevant mathematical tools.

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
MPH-211	NUCLEAR & PARTICLE PHYSICS	3	1	-	4

Course outcomes:

1. Understand the fundamental principles and concepts governing classical nuclear and particle physics and have a working knowledge of their application to real-life problems,
2. The students should be well versed by the end of the course by the basic building blocks of nature and the four fundamental interactions
3. Students will get good theoretical basis of nuclear fission, nuclear fusion and energy production in stars.

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-212	FIBER OPTICS & LASER DEPARTMENTAL ELECTIVE -I	3	1	-	4

Course outcomes:

1. To provide adequate knowledge about the Industrial applications of optical fibers
2. To learn the basic elements of optical fiber transmission link, fiber modes configurations and structures
3. To understand the different kind of losses, signal distortion in optical wave guides and other signal degradation factors.
4. To learn the various optical source materials, LED structures, quantum efficiency, Laser diodes
5. To expose the students to the Laser fundamentals
6. To provide adequate knowledge about basic principles of Laser
To provide adequate knowledge about Industrial application of lasers

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-213	ELECTRONICS -I	3	1	-	4

Course outcomes: After studying this course the students would gain enough knowledge

1. Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
2. To understand and examine the structure of various number systems and its application in digital design
3. The ability to understand, analyze and design various combinational and sequential circuits
4. Ability to identify basic requirements for a design application and propose a cost effective solution.
5. The ability to identify and prevent various hazards and timing problems in a digital design
6. To develop skill to build, and troubleshoot digital circuits.

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-214	ELECTRONICS -II	3	1	-	4

Course outcomes: This course supports the achievement of the following outcomes:

1. Ability to apply knowledge of advanced principles to the analysis of electrical problems.
2. Ability to apply knowledge of advanced techniques to the design of electrical systems
3. Ability to apply the appropriate industry practices, emerging technologies, state-of-the-art design techniques, software tools, and research methods for solving electrical problems

SEMESTER-IV

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-221	MEASUREMENT TECHNIQUE	3	1	-	4

Course outcomes:After reading this syllabus readers should be able to:

1. The student will demonstrate an understanding of the basic principles, theories, and laws of physics through the description of physical systems and understanding of the physical environment in terms of the concepts listed in the course content.
2. Students will demonstrate basic experimental skills by setting up laboratory equipment safely and efficiently, plan and carry out experimental procedures, and report verbally and in written language the results of the experiment.
3. Students will demonstrate basic communication skills by working in groups on laboratory experiments and the thoughtful discussion and interpretation of their results and observations

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-222	NANO SCIENCE AND TECHNOLOGY DEPARTMENTAL ELECTIVE-II	3	1	-	4

Course outcomes: On successful completion of this course, students should be able to

Explain the nanoscale paradigm in terms of properties at the nanoscale dimension by apply key concepts in materials science, chemistry, physics, biology and engineering to the field of nanotechnology and identification of current nanotechnology solutions in design, engineering and manufacturing

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-223	ELECTRONIC COMMUNICATION SYSTEM (SPECIALIZATION ELECTIVE PAPER-III)	3	1	0	4

Course outcomes:

1. After successfully completing the course students will be able to analyze the performance of a baseband and pass band digital communication system in terms of error rate and spectral efficiency

2.	Perform the time and frequency domain analysis of the signals in a communication system.
3.	Select the blocks in a design of digital communication system.
4.	Analyze Performance of spread spectrum communication system
5.	Gain knowledge and understanding of microwave analysis.
6.	Be able to apply analysis methods to determine circuit devices.
7.	Have knowledge of basic communication link design
8.	Have knowledge of how a transmission and waveguide element works in impedance matching and filter circuits.
9	Gain knowledge and understanding of microwave analysis
10	Be able to apply analysis methods to determine circuit devices.
11	Have knowledge of basic communication link design
12	Have knowledge of how a transmission and waveguide element works in impedance matching and filter circuits.

COURSE CODE	COURSE TITLE	L	T	P	CRE DITS
MPH-224	ELECTRONIC DEVICES	3	1	0	4

Course outcomes:

1. **Maintain digital and analog devices and circuits.**
2. **Analyze components associated with digital and analog electronic systems.**
3. **Demonstrate proficiency in the use of electronic equipment and devices.**
4. **Assist in the design, operation, and troubleshooting of electronic systems.**
5. **Analyzing electronics devices and circuits using computer simulations.**
6. **Solve electronic devices and systems using mathematical concepts.**
7. **Accept professional and ethical responsibilities of the engineering technology profession.**
8. **Communicate effectively in technical and non-technical environments**

B.Sc.(H) MATHEMATICS
COURSE OUTCOMES AND PROGRAM OUTCOMES
2021-2022

PROGRAM OUTCOMES:

PO1: Apply the technique of mathematics and its approach in the solution of different Mathematical Problem.

PO2: Identify, formulate, and analyse complex problems reaching substantiated conclusions using mathematical model and its solution approach.

PO3: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of numerical data to provide valid conclusions.

PO4: Students develop critical thinking skills to identify, analyze and solve problems of their core areas using modern tools.

PO5: Students develop lifelong learning skills with interdisciplinary approach towards sustainable development.

PO6: Ability to communicate effectively the comprehended scientific data and knowledge, write effective reports, design documentation and make effective presentations.

PO7: Apply ethical, moral and social values in personal and professional life leading to highly cultured and civilized society.

PO8: Ability to work effectively as an individual or as a member or Team leader in diverse teams and in multidisciplinary environment.

PROGRAM SPECIFIC OUTCOMES:

PSO01: Students acquire knowledge of traditional and modern techniques of solving algebraic, transcendental equations, system of linear differential and integral equations, which have applications in many disciplines.

PSO02: The students attain sound knowledge in the areas of Mechanics, Thermal Physics, Waves and oscillations, optics, electromagnetism, modern physics, solid-state physics for pursuing higher education and research.

COURSE OUTCOMES: Electricity and Magnetism(BS-101)

1. Master the mathematical tools to find electric potential and fields.
2. Learning of important theorems as Gauss theorem.
3. Calculating the electric fields around conductors.

COURSE OUTCOMES: Algebra (BS-103)

1. Students will learn to transform between bases, including the creation, geometric connections, and the application of orthogonal and orthonormal bases.
2. Students will learn Fundamental Theorem of Arithmetic.

COURSE OUTCOMES: Inorganic Chemistry (BS-105)

1. Student will evaluate the periodic properties of elements.
2. To learn and explain electronic structure of atom.
3. To learn, understand and relate the quantum numbers and atomic orbitals.
4. Illustrate the explanation of atomic structure.

Chemistry Laboratory-I (BS-155)

1. Structure identification through IR, NMR and Mass spectroscopic data
2. Lab/Instrumentation techniques used for analyzing reaction mechanisms.

COURSE OUTCOMES: Statistical Physics (BS-102)

1. Understanding of basics of Statistical Physics.
2. Use of the Maxwell- Boltzmann statistics.
3. Use of the Bose-Einstein and Fermi-Dirac Statistics.

COURSE OUTCOMES: Calculus(BS-104)

1. Interpret a function from an algebraic, numerical, graphical and verbal perspective and extract information relevant to the phenomenon modelled by the function.
2. Calculate the limit of a function at a point numerically and algebraically using appropriate techniques including Hospital's rule.

COURSE OUTCOMES: Organic Chemistry(BS-106)

1. To learn the involvement of reactive intermediates and understand their structure and reactivity.
2. To learn and understand the orbital interactions (Woodward Hoffmann rules) in concerted reactions.
3. To calculate optical purity and enantiomer excess.

Chemistry Laboratory-II(BS-154)

1. Structure identification through IR, NMR and Mass spectroscopic data
2. Lab/Instrumentation techniques used for analyzing reaction mechanisms.
3. Understanding of motion of charged particles in electromagnetic fields, principles of the special theory of relativity and invariance of Maxwell equations under the Lorentz transformation and there related problems.

COURSE OUTCOMES: Environmental Science & Ecology(CE-108)

1. Understand fundamental terms related to environment and aware of environmental problems
2. Analyze the complexities of environmental problems and should know remedies available to them and implement them at their own level

COURSE OUTCOMES: Ordinary Differential Equation(BS-201)

1. Distinguish between initial value problems and boundary value problems.
2. Solve standard constant coefficient nonhomogeneous ordinary differential equations by the methods of undetermined coefficients.

COURSE OUTCOMES: Graph Theory(BS-203)

1. Students will be able to learn applications of matrix in graph.
2. It will help to understand Networking.

COURSE OUTCOMES: Real Analysis (BS-205)

1. Demonstrate an understanding of limits and how they are used in sequences, series, differentiation and integration.
2. Understand the concept of uniform convergence of series and sequences.

COURSE OUTCOMES: Number Theory(BS-207)

- 1.Students will learn to apply mathematical concepts and principles to perform numerical and symbolic computations.
- 2.Students will use technology appropriately to investigate and solve mathematical and statistical problems.

COURSE OUTCOMES: Group Theory-I(BS-209)

- 1.Explain the concept of group homomorphism and the application of these concepts
- 2.Be able to produce examples and counter examples illustrating the mathematical concepts presented in the course.

COURSE OUTCOMES: Group Theory-II (BS-202)

1. Verify group properties in particular examples
2. Understand and use the concept of conjugacy.

COURSE OUTCOMES: Theory of Real Functions(BS-204)

1. Demonstrate an understanding of limits and how they are used in sequences, series and differentiation.
2. Construct rigorous mathematical proofs of basic results in real analysis.

COURSE OUTCOMES: PDE and systems of ODE (BS-206)

1. Classify partial differential equations and transform into canonical form.
2. Solve linear partial differential equations of both first and second order.

COURSE OUTCOMES: Numerical Methods (BS-208)

1. Solve an algebraic or transcendental equation using an appropriate numerical method
2. Approximate a function using an appropriate numerical method

COURSE OUTCOMES: Multi Variate Calculus (BS-301)

1. Handle vectors fluently in solving problems involving the geometry of lines, curves, planes, and surfaces in space.
2. Visualize and draw graphs of surfaces in space.

COURSE OUTCOMES: Ring Theory and Linear Algebra-I(BS-303)

1. Will be able to write the statements and proofs of important theorems and be able to explain the key steps in proofs, sometimes with variation.
2. Learn about the fundamental concept of rings, Integral domain and fields
3. Know about ring homomorphism and isomorphism theorem of Rings.

COURSE OUTCOMES: Probability and Statistics (BS-307)

1. How to derive the probability density function of transformations of random variables and use these techniques to generate data from various distributions.
2. Discrete time Markov chains and methods of finding the equilibrium probability distributions.

COURSE OUTCOMES: Riemann Integration and series of functions (BS-309)

1. Read and interpret an expression in sigma notation as the sum of a series of numbers.
2. Express Riemann sums for a function $f(x)$ on a given interval using sigma notation, and identify a function and an interval which give rise to a given Riemann sum in sigma notation.

COURSE OUTCOMES: Analytical Geometry (BS-311)

1. Construct and apply symbolic and graphical representations of functions
2. Model real-life problems mathematically
3. Use technology appropriately to analyse mathematical problems

COURSE OUTCOMES: Linear Programming (BS-302)

1. Describe at an intuitive level the process of artificial intelligence and operations research: a real-time cycle of problem understanding, formulation, solution and implementation
2. Formulate simple reasoning, learning and optimization problems, in terms of the representations and methods presented.

COURSE OUTCOMES: Complex analysis(BS-304)

- 1.Students will demonstrate capacity for mathematical reasoning through analysing, proving and explaining concepts from complex analysis.
- 2.Students will demonstrate accurate and efficient use of complex analysis techniques.

COURSE OUTCOMES: Ring Theory and Linear Algebra-II (BS-306)

- 1.Students completing this course will be able to find the null space of a matrix and represent it
- 2.Apply the theory in the course to solve a variety of problems at an appropriate level of difficulty.

COURSE OUTCOMES: Major Project

- 1. Project outcomes are the changes that occur as a result of your action.**
- 2. Handling of software and getting practical knowledge about theorems and problems.**

1. VISION AND MISSION OF THE DEPARTMENT OF CIVIL ENGINEERING

Vision

To be a School committed to develop globally competent professionals in the area of Civil Engineering who are responsible citizens and have respect for life and sensitivity towards environment.

Mission

M1: To develop professionals & leaders in Civil Engineering who have right attitude & aptitude to serve the society.

M2: To develop and maintain state of the art infrastructure and research facilities to enable, create, apply and disseminate knowledge.

M3: To foster linkages with all stake holders for continuous improvement in academics in Civil Engineering.

M4: To develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders can emerge who have deep respect that have deep respect for human life and values.

M5: To undertake disciplinary and inter-disciplinary collaborative projects which offer opportunities for long term interactions with academia and industry.

2. PROGRAM OUTCOMES

- **PO1. Engineering Knowledge:** Apply the knowledge of Mathematics, Science, and Engineering fundamentals, and an engineering specialization to solution of complex engineering problems.
- **PO2. Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
- **PO3. Design/development of solutions:** Design of solutions for complex engineering problems and design of system components or processes that meet the specified needs with appropriate considerations of public health and safety, and cultural, societal, and environmental considerations.

- **PO4. Conduct investigations of complex problems:** Use research-based methods including design of experiments, analysis and interpretation of data and synthesis of information leading to logical conclusions.
- **PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling complex engineering activities with an understanding of limitations.
- **PO6. The engineer and society:** Apply reasoning within the contextual knowledge to access societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in the societal and environmental contexts, and demonstrate the knowledge of, and the need for sustainable developments.
- **PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
- **PO9. Individual and team work:** Function effectively as an individual independently and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large such give and receive clear instructions.
- **PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering management principles and apply those to one's own work as a member and leader of a team to manage projects in multidisciplinary environments.
- **PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

3. PROGRAM SPECIFIC OUTCOMES

PSO1: Students are trained to plan, design, construct and operate society economic and social engine that built the environment and also protecting, restoring the natural environment.

PSO2: Students are practiced to use augmented tools and technologies to complete the civil engineering project within specified time and funds.



DEPARTMENT OF CIVIL ENGINEERING

B. Tech.

Civil Engineering (CE)

(2021-22 BATCH)

Lingaya's Vidyapeeth, Faridabad

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 1st Year/1st Semester

Course Code	Course Name	L-T-P	Credit
BSC-101	Physics	3-1-0	4

Course Outcomes

The objective of this course is to familiarize the prospective engineers with techniques in calculus, multivariate analysis and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

Course Code	Course Name	L-T-P	Credit
BSC-103	Mathematics - I	3-1-0	4

nit I: Matrices (10 lectures)

Course Outcomes

The objective of this course is to familiarize the prospective engineers with techniques in calculus, multivariate analysis and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 1st Year/1st Semester

Course Code	Course Name	L-T-P	Credit
ESC-101	Basic Electrical Engineering	3-1-0	4

Learning Objectives:

- To understand and analyze basic electric and magnetic circuits
- To study the working principles of electrical machines and power converters.
- To introduce the components of low voltage electrical installations.

Course Outcomes

- Students are able to understand and analyze basic electric and magnetic circuits
- Students are able to understand the working principles of electrical machines and power converters.

Course Code	Course Name	L-T-P	Credit
ESC-103	Introduction to Computer Systems & Internet Basics	3-0-0	3

Objective: To give basic knowledge of Computer Hardware, Software systems & internets
Anchor Tag, Email Link; embedding images and controlling appearance, table creation: Frames and Nesting, iframes, forms, Semantic elements of HTML5, HTML5 Form elements, Media tags in HTML5, HTML5 Data Storage

Course Code	Course Name	L-T-P	Credit
ESC-153	Engineering Graphics & Design	0-0-6	3

Course Outcomes

All phases of manufacturing or construction require the conversion of new ideas and design concepts into the basic line language of graphics. Therefore, there are many areas (civil, mechanical, electrical, architectural and industrial) in which the skills of the CAD technicians play major roles in the design and development of new products or construction. Students prepare for actual work situations through practical training in a new state-of-the-art computer designed CAD laboratory using engineering software. This course is designed to address:

- ☐ to prepare you to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- to prepare you to communicate effectively
- to prepare you to use the techniques, skills, and modern engineering tools necessary for engineering practice

The student will learn :

Introduction to engineering design and its place in society

- Exposure to the visual aspects of engineering design
- Exposure to engineering graphics standards

Exposure to solid modelling

**SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 1st Year/1st Semester**

**SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 1st Year/1st Semester**

Course Code	Course Name	L-T-P	Credit
HSS-101	English	2-0-0	2

Course Outcomes

The student will acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.

Course Code	Course Name	L-T-P	Credit
HSS-151	English Lab	0-0-2	1

1. Comprehension
2. Pronunciation, Intonation, Stress and Rhythm
3. Common Everyday Situations: Conversations and Dialogues communication at Workplace
4. Interviews
5. Formal Presentations

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 1st Year/1st Semester

Course Code	Course Name	L-T-P	Credit
MC-101	Environmental Science	2-0-0	0

Course Outcomes

The objective of this course is to familiarize the students with statistical techniques. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling various problems in the discipline.

Course Code	Course Name	L-T-P	Credit
PDP-101	Induction & Nurturing Hobbies	0-0-2	1

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 1st Year/2nd Semester

Course Code	Course Name	L-T-P	Credit
BSC-102	Chemistry	3-1-0	4

Course Outcomes

The objective of this course is to familiarize the students with statistical techniques. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling various problems in the discipline.

Course Code	Course Name	L-T-P	Credit
BSC-104	Mathematics - II	3-1-0	4

Course Outcomes

The objective of this course is to familiarize the students with statistical techniques. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling various problems in the discipline.

Course Code	Course Name	L-T-P	Credit
ESC-102	Programming for Problem Solving	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 1st Year/2nd Semester

Course Code	Course Name	L-T-P	Credit
HSS-102	Effective Technical Communication	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 1st Year/2nd Semester

Course Code	Course Name	L-T-P	Credit
ESC-152	Workshop/Manufacturing Practice	0-0-4	2

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 1st Year/2nd Semester

Course Code	Course Name	L-T-P	Credit
BSC-152	Chemistry Lab	0-0-2	1

Course Code	Course Name	L-T-P	Credit
ESC-152	Programming for Problem Solving Lab	0-0-2	1

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

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SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 1st Year/2nd Semester

Course Code	Course Name	L-T-P	Credit
PDP-102	People Connect	0-0-2	1

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 1st Year/2nd Semester

Course Code	Course Name	L-T-P	Credit
MC-102	Constitution of India	2-0-0	2

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/3rd Semester

Course Code	Course Name	L-T-P	Credit
BSC-201	Mathematics – III (Numerical Methods)	3-1-0	4

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/3rd Semester

Course Code	Course Name	L-T-P	Credit
ME-203C	Fluid Mechanics	3-1-0	4

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/3rd Semester

Course Outcomes

CO1: Identify and obtain the values of fluid properties and relationship between them and understand the principles of continuity, momentum, and energy as applied to fluid motions.

CO2: To understand the flow measurement devices like venture meter and orifice meter.

CO3: Apply dimensional analysis to predict physical parameters that influence the flow in fluid mechanics.

CO4: Estimate the friction and measure the frictional losses in fluid flow.

CO5: Predict the coefficient of discharge for flow through pipes, to understand the concept of boundary layer theory.

Course Code	Course Name	L-T-P	Credit
ME-205C	Engineering Mechanics	3-1-0	4

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/3rd Semester

Course Outcomes

- CO1. Solve engineering problems involving the equilibrium of particles and rigid bodies.
 CO2. Solve the problems involving dry friction and virtual work.
 CO3. Determine the centroid, center of gravity, and moment of inertia of various surfaces and solids.
 CO4. Solve problems related to kinematics and kinetics of a rigid body.
 CO5. Solve problems using the energy-momentum principle for a particle and rigid bodies in plane motion.

Course Code	Course Name	L-T-P	Credit
CE-201C	Introduction to Civil Engineering	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/3rd Semester

Course Code	Course Name	L-T-P	Credit
CE-203C	Building Material & Construction	3-0-0	3

Course Outcomes

CO1: Identify various building materials and their structural requirements.

CO2: Explain the significance of cement, timber, bitumen and lime in construction.

CO3: Identify the suitable material for construction and various building components and their types.

CO4: Review different types of masonry construction.

CO5: Identify the various types of wall and their introductions

Course Code	Course Name	L-T-P	Credit
CE-251C	Computer Aided Civil Engineering Drawing	0-0-2	1

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/3rd Semester

Course Code	Course Name	L-T-P	Credit
BSC-251	Mathematics – III (Numerical Methods) Lab	0-0-2	1

Course Code	Course Name	L-T-P	Credit
ME-256C	Fluid Mechanics Lab	0-0-2	1

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/3rd Semester

Course Code	Course Name	L-T-P	Credit
PDP-201	Personality Development & Grooming	0-0-2	1

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/4th Semester

Course Code	Course Name	L-T-P	Credit
CE-202C	Soil Mechanics & Engineering Geology	3-1-0	4

Course Outcomes

CO1: To acquire knowledge of rock, their properties and Classification. CO2: To acquire knowledge of soil, their properties and Classification.
CO3: To find out the permeability, stresses, bearing pressure and contact pressure.
Co4: To gain knowledge about seepage and stresses of soil
soil as angle of internal friction and cohesive strength.

Course Code	Course Name	L-T-P	Credit
CE-204C	Disaster Preparedness & Planning	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/4th Semester

Course Outcomes

CO1 Learn use of basic concepts of disaster management
CO2 Understand definitions and terminologies used in disaster management
CO3 Relate to type and categories of disasters and their impacts
CO4 Analyze relationship between development and disasters
CO5 Understand the challenges posed by various disasters

Course Code	Course Name	L-T-P	Credit
ME-204C	Strength of Materials	3-1-0	4

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/4th Semester

Course outcomes:

CO1-Students will be able to predict mechanical behavior of the member by determining the stresses, strains and deflections produced by the loads up to the elastic limit.

CO2- Students will be able to solve the stresses in determinate and indeterminate, homogeneous and composite bars under concentrated loads, self-weight and thermal loads.

CO3-Students will be proficient to construct Shear Force and Bending Moment diagrams for statically determinate beam due to concentrated load, uniformly distributed load, uniformly varying load and couple. CO4-Students will be able to determine bending and shear stresses in machine elements

CO5-Students will be able to Evaluate Slope and Deflection of Statically Determinate beams subjected to concentrated load, uniformly distributed load, uniformly varying load and couple and also strain energy in members subjected to Gradual, sudden and impact loads

Course Code	Course Name	L-T-P	Credit
CE-206C	Surveying & Geomatics	3-1-0	4

Course Outcomes

CO1: Apply the knowledge of levelling in different operations in civil engineering

projects. CO2: Summarize the principles and purpose of basic levelling in surveying.

CO3: Formulate the Trigonometric and leveling methods.

CO4: Develop skills to conduct traverse survey & to find the area

CO5: To provide knowledge of Total Station, Theodolite. & advanced surveying instruments.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/4th Semester

Course Code	Course Name	L-T-P	Credit
CE-208C	Environmental Engineering	3-1-0	4

1. .

Course Outcomes

On successful completion of the course, the students shall be able to understand the following

CO1. Able to plan and design water supply systems for a rural/urban area.

CO2 .Able to understand Sewage quantity and quality for better treatment so as to reduce scarcity by recycling waste water.

CO3. Understanding of the nature and characteristics of air pollutants, and basic concepts of air quality management.

CO4. Outline sources, types and composition of solid waste with methods of handling, sampling and storage of solid waste.

CO5. Understand building plumbing system.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/4th Semester

Course Code	Course Name	L-T-P	Credit
HSS-202	Engineering Economics & Management	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/4th Semester

Course Code	Course Name	L-T-P	Credit
CE-252C	Soil Mechanics & Engineering Geology Lab	0-0-2	1

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/4th Semester

Course Code	Course Name	L-T-P	Credit
ME-254C	Strength of Materials Lab	0-0-2	1

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/4th Semester

Course Code	Course Name	L-T-P	Credit
CE-254C	Surveying & Geomatics Lab	0-0-2	1

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/4th Semester

Course Code	Course Name	L-T-P	Credit
CE-256C	Environmental Engineering Lab	0-0-2	1

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 2nd Year/4th Semester

Course Code	Course Name	L-T-P	Credit
PDP-202	Life Skills	0-0-2	1

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/5th Semester

Course Code	Course Name	L-T-P	Credit
CE-301C	Concrete Technology	3-0-0	3

Course Outcomes

- CO1: To understand the role of cement, aggregates, and water in concrete along with a detailed study of cement.
- CO2: To learn different tests that can be performed on coarse and fine aggregates and grading curves.
- CO3: To know about admixtures both mineral and chemical.
- CO4: To understand thoroughly about special concretes.
- CO5: To do nominal mix design and site adjustments to mix design.

Course Code	Course Name	L-T-P	Credit
CE-303C	Geotechnical Engineering	3-1-0	4

Course Outcomes

- CO1: To acquire knowledge method of boring , soil investigation.
- CO2: To acquire knowledge of retaining walls, earth pressure acting on retaining structures.
- CO3: To find out the stability of soil, effective stresses and their analysis.
- CO4: To gain knowledge about shallow foundation, deep foundation, types of settlement in soil.
- CO5: Students will be able to gain knowledge about well foundation their types and shapes, forces acting on well.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/5th Semester

Course Outcomes

Course Code	Course Name	L-T-P	Credit
CE-305C	Hydrology & Water Resource Engineering	3-1-0	4

On successful completion of the course, the students shall be able to understand the following

CO1: Student will know the different terminologies related with hydrology.

CO2: Students will analyze hydrological parameters required for water resource management.

CO3: Student will assess ground water potential.

CO4: Students will identify suitable method of drainage of waterlogged area .

CO5: Students will able to assess movement of groundwater and flood routing

Course Code	Course Name	L-T-P	Credit
CE-307C	Highway Engineering	3-1-0	4

CO1 Basic concept about Highway Engineering

CO2 To understand the principles of Highway geometrics design as per IRC standards

CO3 Perform geometric design for the Highway& Basic concept of Pavement design

CO4 To understand Types of pavements & Materials required for highway construction.

CO5 To understand Construction procedure for different type of pavements.

CO6 To understand maintenance procedure for different type of pavements.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/5th Semester

Course Code	Course Name	L-T-P	Credit
CE-309C	Design of Concrete Structures	3-1-0	4

Course Outcomes

- CO1: The students will be able to visualize and understand fundamental concepts of the Working method.
- CO2: The students will be able to visualize and understand fundamental concepts of the Limit State method.
- CO3: The students will be able to apply the concepts of shear, bond and torsion in the beam section.
- CO4: The students will be able to analyze typical structures such as one-way and two-way slabs.
- CO5: The students will be able to determine the foundation for different structures and different loading conditions.
- CO6: The students will be able to understand thoroughly the design of Columns.

Course Code	Course Name	L-T-P	Credit
CE-351C	Design of Concrete Structures Lab	0-0-2	1

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/5th Semester

Course Code	Course Name	L-T-P	Credit
CE-353C	Geotechnical Engineering Lab	0-0-2	1

Course Code	Course Name	L-T-P	Credit
CE-355C	Hydraulic Engineering Lab	0-0-2	1

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

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SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/5th Semester

Course Code	Course Name	L-T-P	Credit
CE-357C	Highway Engineering Lab	0-0-2	1

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester

Course Code	Course Name	L-T-P	Credit
PDP-301	Leadership & Entrepreneurial Development	0-0-2	1

Course Code	Course Name	L-T-P	Credit
CE-311C	Repair & Rehabilitation of Structures	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

**SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester**

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Course Outcomes

CO1.Relate to the impact of Civil Engineering on the Society.

CO2.Relate to sustainability of the Environment, including its

Aesthetics.

CO3.Judge Infrastructure, its requirements for energy and how they are met: past,present and

future. CO4.Apply professional and responsible judgement and take a leadership role.

CO5.Develop the importance of Civil Engineering in shaping and impacting the world.

Course Code	Course Name	L-T-P	Credit
CE-313C	Construction Equipment's & Automation	3-0-0	3

Course Outcomes

CO1: To acquire knowledge about construction methods.

CO2:To acquire knowledge of Equipment for

CO3: To gain knowledge about Prestressing jacks.

CO4: To gain knowledge about Equipment for transportation of

materials. CO5: To acquire knowledge about Equipment Productivities.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester

Course Code	Course Name	L-T-P	Credit
CE-315C	Building Construction Practice	3-0-0	3

Course Outcomes

CO1: To acquire knowledge site clearance, stone work, earthwork masonry. CO2: To acquire knowledge of types of joints, pavement.

CO3: To acquire knowledge of frame work building foundations.

CO4: To gain knowledge about piles, types of well, shallow foundation, deep foundation

CO5: Students will be able to gain knowledge about in-situ pre-stressing in high rise

Course Code	Course Name	L-T-P	Credit
CE-302C	Specification Estimation & Costing	3-1-0	4

Course Outcomes

On successful completion of the course, the students shall be able to understand the following CO1. Understand different types of estimates used in the field of civil engineering.

CO2. Students will able to estimate the cost of building.

CO3. Students will able to know specification of roads and other building structures

CO4. Students will able to determine items used in RCC work.

CO5. Students will able to perform rate analysis.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester

Course Code	Course Name	L-T-P	Credit
CE-304C	Structural Analysis – I	3-1-0	4

Course Outcomes

- CO1 The students will be able to extend the concepts taught in Structural Analysis I (Determinate Structures) to indeterminate structures.
- CO2 The students will be able to understand how real-life structures behave like space trusses.
- CO3 The Student will be able to understand and apply various methods of analysis of structures
- CO3 The Student will be able to understand and apply the nature and behaviour of Moving Loads
- CO4 The Student will be able to understand and apply to analyse Arches using the Influence Line method Indeterminate truss.

Course Code	Course Name	L-T-P	Credit
CE-306C	Design of Steel Structures	3-1-0	4

Course Outcomes

- CO1 The students will be able to extend the concepts taught in the Design of Steel Structure Plastic Analysis.
- CO2 The students will be able to understand structures behaviour in connection with bolted joints and welded joints.
- CO3 The Student will be able to understand and apply various methods of design of compression members with
- CO4. The Student will be able to understand and apply the nature and behaviour of Plate girder.
- CO5 The Student will be able to understand and apply to analyse of eccentric load in column bases.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester

Course Code	Course Name	L-T-P	Credit
CE-308C	Open Channel Flow	3-0-0	3

Course Outcomes

CO1: Able to use important practical results in common fluid flows.

CO2: Able to determine metacentre of a floating vessel.

CO3: Able to calibrate various flow measuring devices in pipe and open channel flow .

CO4: Able to determine various losses and velocity in pipe flow in field.

CO5: Able to understand the behaviour of water current in rivers, canal and drains.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester

Course Code	Course Name	L-T-P	Credit
CE-352C	Structural Analysis – I Lab	0-0-2	1

Course Code	Course Name	L-T-P	Credit
CE-354C	Major Project – I	0-0-4	2

To set the objectives, deliverables, work plan, logistics planning and milestones with discernible outputs and then to demonstrate the feasibility through some initial work.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester

Course Code	Course Name	L-T-P	Credit
PDP-302	Problem Solving Skills	0-0-2	1

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester
Program Elective – II (Choice 2)

Course Code	Course Name	L-T-P	Credit
CE-310C	Construction Project Management	3-0-0	3

Course Outcomes

On successful completion of the course, the students shall be able to understand the following

CO1. Students will able to understand the terminologies used in large projects

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester
Program Elective – II (Choice 3)

- CO2. Students will able to know techniques of planning of construction projects.
- CO3. Be able to apply theoretical and practical aspects of project management techniques to achieve project goals.
- CO4. Students will able to understand role of resource scheduling in projects
- CO5. Become familiar with construction equipment and their capabilities and also learn how to best utilize construction equipment on site work and heavy civil projects

Course Code	Course Name	L-T-P	Credit
CE-314C	Construction Productivity	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

Course Code	Course Name	L-T-P	Credit
CE-318C	Construction Project Planning & System	3-0-0	3

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester
Program Elective – III (Choice 85)

Course Code	Course Name	L-T-P	Credit
CE-312C	Traffic Planning & Management	3-0-0	3

Unit I

Transport planning process systems : Approach to transport planning, Stages in transport planning survey and analysis of existing conditions, Forecast analysis of future conditions and plan synthesis difficulties in the transport planning process, Transportation survey, Type of surveys, Inventory of transport facilities, Inventory of land use and economic activities, Expansion of data from samples

Unit II

Trip generation : Trip purpose, Factors governing trip generation and attraction rates, Multiple linear regression analysis, Category analysis

Trip distribution : Methods of trip distribution, Uniform constant factor method, Average factor method, Fratar method, Furness method, Gravity model, Tanners model, Opportunity model

Unit III

Traffic Assignment : Assignment technique, Capacity restraint assignment, Diversion curves

Modal split : Factors affecting modal split, Modal split in the transport planning process, Recent developments in modal split analysis

Unit IV

Evaluation : Need for Evaluation, Several plans to be formulated, Consideration in evaluation, Economic evaluation

Land use Transport models : Selection of land use transport models, Lowry Derivative Models, Garin-Lowry Model

Unit V

Transport planning for small, medium and large cities : Difficulties in transport planning for small and medium cities, Quick response techniques, Public transport in cities, Planning for public transport, Fares and subsidies

Intermediate public transport in Indian cities : Type of IPT vehicles in India, Characteristics of IPT modes

Unit VI

Computer application in transport planning : Transport planning and computer applications, Computer applications in public transport systems simulation, Programme packages, Use of information technology in transportation

Text Books:

1. TRAFFIC ENGINEERING AND TRANSPORT PLANNING by L.R. KADIYALI, KHANNA PUBLISHERS, 1st Edition, (2007)

2. HIGHWAY ENGINEERING by S,K, KHANNA AND C,E,J JUSTO, NEM CHAND BROTHERS, 1st Edition,

**SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester
Program Elective – III (Choice 86)**

Course Code	Course Name	L-T-P	Credit
CE-316C	Transportation Economics	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester
Program Elective – IV (Choice 1)

Course Code	Course Name	L-T-P	Credit
CE-320C	Traffic Engineering	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
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Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

Course Outcomes

- CO 1 Use statistical concepts and applications in traffic engineering.
 CO 2 Identify traffic stream characteristics.
 CO 3 Understand elements of highway safety and approaches to accident Studies.
 CO 4 Understand about the importance of traffic and its regulations
 CO 5 Understand about street lights and their process of work

Course Code	Course Name	L-T-P	Credit
CE-356C	Construction Project Management Lab	0-0-2	1

Course Objectives:

- Student will get complete knowledge about applications of CPM and PERT.
- Student will learn about how to bring the project to completion on time.
- Syllabus emphasizes on managing the project cost and contingencies.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester
Program Elective – IV (Choice 2)

Course Code	Course Name	L-T-P	Credit
CE-358C	Building Drawing Lab	0-0-2	1

Course Objectives:

- Student will get complete knowledge about applications of building drawing using advanced design software's such as AutoCad 3D, Revit, etc.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 3rd Year/6th Semester
Program Elective – IV (Choice 3)

Course Code	Course Name	L-T-P	Credit
CE-360C	Structural Drawing Lab	0-0-2	1

Course Objectives:

- Student will get complete knowledge about applications of structural drawing using Staad Pro software.

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
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SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester

Course Code	Course Name	L-T-P	Credit
CE-401C	Metro Systems & Engineering	3-0-0	3

Course Outcomes

- CO 1 Handling of huge intra-city traffic for highly populated urban areas
- CO 2 Optimum construction methodologies for intra-city Transportation systems
- CO 3 Knowledge on Railway safety and construction planning
- CO 4 Knowledge on Railway alignment and track design
- CO 5 Knowledge on MECHANICAL PARTS IN RAILWAY

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester

Course Code	Course Name	L-T-P	Credit
CE-403C	Structural Analysis – II	3-1-0	4

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

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SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester

Course Code	Course Name	L-T-P	Credit
CE-451C	Major Project – II	0-0-8	4

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
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SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester

Course Code	Course Name	L-T-P	Credit
PDP-401	Campus to Corporate	0-0-2	1

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Program Elective – V (Choice 8)

Course Code	Course Name	L-T-P	Credit
CE-405C	Airport Planning Design and Management	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

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SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Program Elective – V (Choice 9)

Course Code	Course Name	L-T-P	Credit
CE-411C	Railway Engineering	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
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SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Program Elective – V (Choice 10)

Course Code	Course Name	L-T-P	Credit
CE-417C	Geometric Design of Highways	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
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SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Program Elective – VI (Choice 11)

Course Code	Course Name	L-T-P	Credit
CE-407C	Waste Water Engineering	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Program Elective – VI (Choice 12)

Course Code	Course Name	L-T-P	Credit
CE-413C	Ecological Engineering	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
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SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Program Elective – VI (Choice 13)

Course Code	Course Name	L-T-P	Credit
CE-419C	Water and Air Quality Modelling	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
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SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Program Elective – VII (Choice 14)

Course Code	Course Name	L-T-P	Credit
CE-409C	Irrigation Engineering	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
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SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Program Elective – VII (Choice 15)

Course Code	Course Name	L-T-P	Credit
CE-415C	Surface Hydrology	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

**SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Program Elective – VII (Choice 16)**

Course Code	Course Name	L-T-P	Credit
CE-421C	Water Resource Field Methods	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

**SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Program Elective – VIII (Choice 17)**

Course Code	Course Name	L-T-P	Credit
CE-453C	Staad. Pro Lab	0-0-2	1

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Program Elective – VIII (Choice 2)

Course Code	Course Name	L-T-P	Credit
CE-455C	Waste Water Engineering Lab	0-0-2	1

Course Code	Course Name	L-T-P	Credit
CE-457C	Estimation & Coasting Lab	0-0-2	1

List of Experiments:

1. Estimation of Building (Long Wall and Short Wall Method)
2. Estimation of Building (Center Line Method)
3. Analysis of Rate for Concrete Work
4. Analysis of Rate for Brick Work
5. Analysis of Rate for Plaster Work
6. Estimate Quantity of Reinforcement
7. Preparation for Approximate Estimate for Road Project
8. Estimating Cost of Building on Plinth Area Method

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Open Elective – I (Choice 19)

Course Code	Course Name	L-T-P	Credit
CE-423C	Building Construction & Materials	3-0-0	3

SCHEME & SYLLABUS FROM-2018 BATCH
SCHOOL OF ENGINEERING & TECHNOLOGY
Department of Civil Engineering
Year/Semester: 4th Year/7th Semester
Open Elective – I (Choice 20)

Course Code	Course Name	L-T-P	Credit
CE-425C	Transportation Engineering & Systems	3-0-0	3

Course Objectives:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Upon completion of this course, the students will gain knowledge of the different manufacturing processes and day to day industrial as well domestic life which are commonly employed in the industry, to fabricate components using different materials.

Course Code	Course Name	L-T-P	Credit
CE-402C	MOOC	3-0-0	3

On-line MOOC courses may contribute upto 20% of the credits. One MOOC course to be completed by the student from NPTEL and have to pass the examination conducted by the NPTEL.



**DEPARTMENT OF CIVIL ENGINEERING
(CE)**

Course of Study

**Master of Technology (MTech)
Civil Engineering (CE)**

Lingaya's Vidyapeeth, Faridabad

LINGAYA'S VIDYAPEETH

SCHEME OF STUDIES

SESSION: 2021-23

School: Engineering and Technology								Batch:2021-2023					
Department: Civil Engineering								Year: 1 st					
Course: M.Tech								Semester: 1 st					
S N	Cate- gory	Course Code	Course Name	Periods			Credit s	Evaluation Scheme					Subject Total Marks
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
1	PCC	AM-501	Advanced Engineering Mathematics	3	1	0	4	15	25	60	-	-	100
2	PCC	RM-501	Research Process Methodology	3	1	0	4	15	25	60	-	-	100
3	PCC	CE-501	Project Planning & Control	3	0	0	3	15	25	60	-	-	100
4	PCC	CE-503	Quality Control & Safety in Construction	3	1	0	4	15	25	60	-	-	100
5	PCC	CE-505	Civil Engineering Materials	3	0	0	3	15	25	60	-	-	100
6	PCC	CE-557	Construction Material Lab	0	0	2	2	-	-	-	60	40	100
Total---->							20						

Abbreviations:

PCC:	Programme Core Courses	ABQ:	Assignment Based Quiz
PEC:	Programme Elective Courses	MSE:	Mid Semester Examination
PROJ:	Project	ESE:	End Semester Examination
PDP:	Personality Development Programme	IP:	Internal Practical
L:	Lecture	EXP:	External Practical
T:	Tutorial		
P:	Practical		

SCHEME OF STUDIES

School: Engineering and Technology								Batch:2021-2023					
Department: Civil Engineering								Year: 1 st					
Course: M.Tech								Semester: 2 nd					
S N	Cate- gory	Course Code	Course Name	Periods			Credits	Evaluation Scheme					Subject Total Marks
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
1	PCC	CE-502	Advance Soil Mechanics	3	1	0	4	15	25	60	-	-	100
2	PCC	CE-504	Construction & Maintenance Management	3	1	0	4	15	25	60	-	-	100
3	PEC	CE-506(A/ B/C/D)	Departmental Elective – I	3	1	0	3	15	25	60	-	-	100
4	PEC	CE-508(A/ B/C/D)	Departmental Elective – II	3	0	0	4	15	25	60	-	-	100
5	PEC	CE-510(A/ B/C/D)	Departmental Elective – III	3	0	0	3	15	25	60	-	-	100
6	PEC	CE-552	Advanced Soil Mechanics Lab	0	0	2	2	-	-	-	60	40	100
7	PEC	AC-502 (A/B)	Audit Course -I	2	0	0	0	-	-	-	-	-	-
Total---->							20						

Abbreviations:

PCC:	Programme Core Courses	ABQ:	Assignment Based Quiz
PEC:	Programme Elective Courses	MSE:	Mid Semester Examination
PROJ:	Project	ESE:	End Semester Examination
PDP:	Personality Development Programme	IP:	Internal Practical
L:	Lecture	EXP:	External Practical
T:	Tutorial		
P:	Practical		



LINGAYA'S VIDYAPEETH SCHEME OF STUDIES

School: Engineering and Technology								Batch:2021-2023					
Department: Civil Engineering								Year: 2 nd					
Course: M.Tech								Semester: 3 rd					
S N	Cate- gory	Course Code	Course Name	Periods			Credits	Evaluation Scheme					Subject Total Marks
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EX P	
1	PCC	CE-601(A/ B/C/D)	Departmental Elective – IV	3	1	0	4	15	25	60	-	-	100
2	PEC	CE-603(A/ B/C/D)	Open Elective	3	0	0	3	15	25	60	-	-	100
3	PCC	CE-651	FEM Software base Lab study	0	0	4	2	-	-	-	60	40	100
4	PCC	CE-661	Dissertation-I	0	0	20	10	-	-	-	60	40	100
5	PEC	AC-601(A/B)	Audit Course -II	2	0	0	0	-	-	-	-	-	-
Total---->							19						

Abbreviations:

PCC: Programme Core Courses
 PEC: Programme Elective Courses
 PROJ: Project
 PDP: Personality Development Programme
 L: Lecture
 T: Tutorial
 P: Practical

ABQ: Assignment Based Quiz
 MSE: Mid Semester Examination
 ESE: End Semester Examination
 IP: Internal Practical
 EXP: External Practical



LINGAYA'S VIDYAPEETH SCHEME OF STUDIES

School: Engineering and Technology								Batch:2021-24					
Department: Civil Engineering								Year: 2nd					
Course: M.Tech								Semester: 4th					
S N	Cate- gory	Course Code	Course Name	Periods			Credits	Evaluation Scheme					Subject Total Marks
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EX P	
1	PCC	CE-602	Seminar	0	0	2	1	-	-	-	60	40	100
2	PCC	CE-662	Dissertation-II	0	0	36	18	-	-	-	60	40	100
Total---->							19						

Abbreviations:

PCC: Programme Core Courses
 PEC: Programme Elective Courses
 PROJ: Project
 PDP: Personality Development Programme
 L: Lecture
 T: Tutorial
 P: Practical

ABQ: Assignment Based Quiz
 MSE: Mid Semester Examination
 ESE: End Semester Examination
 IP: Internal Practical
 EXP: External Practical

List of Departmental Electives

Departmental Elective – I

1	CE-506A	Air Pollution Control
2	CE-506B	Advance structure engineering
3	CE-506C	Construction Project Management
4	CE-506D	Advance Railway Engineering

Departmental Elective – II

1	CE-508A	Advance Water Supply & Wastewater Management
2	CE-508B	Advance Design of steel structures
3	CE-508C	Rehabilitation of Structures
4	CE-508D	Analysis & Structural Design of Pavement

Departmental Elective – III

1	CE-510A	Integrated Solid Waste Management
2	CE-510B	Bridge engineering
3	CE-510C	Construction Practice & Equipment
4	CE-510D	Highway Planning and Geometric Design

Departmental Elective – IV

1	CE-601A	Solid and Biomedical Waste Management
2	CE-601B	Advance Structure Analysis
3	CE-601C	Rock Mechanics
4	CE601D	Urban Transportation Planning

Open Elective

1	CE-603A	Remote Sensing & GIS Technology
2	CE-603B	Optimization Methods in Civil Engineering
3	CE-603C	Environmental Impact Assessment
4	CE-603D	Industrial Safety

Audit Course 1 & 2

1	AC-502A	English for Research Paper Writing
2	AC-502B	Disaster Management
3	AC-601A	Pedagogy Studies
4	AC-602B	Personality Development through Life Enlightenment Skills

Department of Civil Engineering
M.Tech Batch 2021-23

Course Code	Subject Name	L-T-P	Cr.
CE-501	Project Planning and Control	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a) Students will comprehend the project planning process, distinguishing between various types of project plans such as project feasibility plans, preliminary plans, and construction plans.
- b) Understand static concepts related to construction projects and their impact on project management, including the principles of material management, purchase management, and inventory control.
- c) Acquire knowledge of cost functions in construction projects and the trade-offs between time and cost. Understand the concept of time-cost trade-offs.
- d) Understand the principles of project quality management, including quality planning, quality assurance, and quality control in construction projects.
- e) Learn the intricacies of planning construction manpower, including scheduling construction site workers and optimizing their utilization.

Course Code	Subject Name	L-T-P	Cr.
CE-503	Quality Control and Safety in Construction	3-1-0	4

Course Outcomes: At the end student will be able to learn

- a) Understand the fundamentals of quality planning in the context of designing structures.
- b) Develop quality manuals, checklists, and inspection reports for effective quality management.
- c) Integrate the concept of safety into the overall quality management framework.
- d) Appl strategies for accident prevention and safety management in construction.
- e) Implement site management practices aligned with safety recommendations.

Course Code	Subject Name	L-T-P	Cr.
CE-505	Civil Engineering Materials	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a) Understand the process of cement hydration, chemical reactions, and setting in cement.
- b) Evaluate the properties of hardened concrete, including strength, toughness, hardness, durability, impermeability, and dimensional changes.
- c) Measure water accurately and understand the principles of hand mixing and machine mixing.
- d) Identify the uses of fiber cement and various admixtures such as accelerators, air-entraining agents, water-reducing agents, and set-controlling agents.
- e) Conduct tests on the composition of hardened concrete, including cement content and original water/cement (w/c) ratio.

Department of Civil Engineering
M.Tech Batch 2021-23

Course Code	Subject Name	L-T-P	Cr.
AM-501	Advanced Engineering Mathematics	3-1-0	4

Course Outcomes: At the end student will be able to learn

- a) Understand the concept of integration in scribes, ordinary, and singular points.
- b) Apply Laplace Transform and Inverse Laplace Transform in solving integral and integro-differential equations.
- c) Solve missing-terms problems and fitting of a curve in a given sub-interval using cubic spline interpolation.
- d) Utilize Gaussian integration for numerical double integration.
- e) Solve Fredholm and Volterra integral equations of the first and second kind.

Course Code	Subject Name	L-T-P	Cr.
RM-501	Research Process Methodology	3-1-0	4

Course Outcomes: At the end student will be able to learn

- a) Understand the meaning and significance of a research problem.
- b) Demonstrate effective technical writing skills for research reports and papers.
- c) Comprehend the processes involved in patenting and technological research and innovation.
- d) Utilize patent information and databases for research.
- e) Analyze intellectual property rights in biological systems, computer software, and traditional knowledge.

Course Code	Subject Name	L-T-P	Cr.
CE-557	Construction Materials Lab	0-0-2	1

Course Code	Subject Name	L-T-P	Cr.
CE-502	Advance Soil Mechanics	3-1-0	4

Course Outcomes: At the end student will be able to learn

- a) Understand the concept of effective stress, pore pressure, and hydraulic conductivity.
- b) Evaluate the effect of smear on consolidation settlements.
- c) Apply the stress path method for settlement analysis.
- d) Analyze active, passive, and pressure at rest conditions in earth pressure.
- e) Design bulkheads with free and fixed earth supports using the equivalent beam method.

Department of Civil Engineering
M.Tech Batch 2021-23

Course Code	Subject Name	L-T-P	Cr.
CE-504	Construction and Maintenance Management	3-1-0	4

Course Outcomes: At the end student will be able to learn

- a) Understand the principles of engineering economy and apply minimum cost point analysis.
- b) Formulate construction teams and stages in construction projects.
- c) Understand the principles and functions of management, including scientific management.
- d) Implement inventory control and management, as well as disposal strategies for surplus materials.
- e) Analyze hauling equipment, including trucks and bottom dump wagons, considering capacities and balancing with excavators.

Course Code	Subject Name	L-T-P	Cr.
CE-522	Advance Soil Mechanics Lab	0-0-2	1

Course Code	Subject Name	L-T-P	Cr.
CE-506A	Air Pollution and Control	3-1-0	4

Course Outcomes: At the end student will be able to learn

- a) Understand the principles of engineering economy and apply minimum cost point analysis.
- b) Formulate construction teams and stages in construction projects.
- c) Understand the principles and functions of management, including scientific management.
- d) Implement inventory control and management, as well as disposal strategies for surplus materials.
- e) Evaluate the gradability of bulldozers and their use in construction.

Departmental Elective –I

Course Code	Subject Name	L-T-P	Cr.
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Department of Civil Engineering
M.Tech Batch 2021-23

CE-506B	Advanced Structural Engineering	3-1-0	4
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Course Outcomes: At the end student will be able to learn

- a) Understand different coordinate systems and their transformation in structural analysis.
- b) Apply the finite element method for the analysis of plane stress and strain in structures.
- c) Understand the variational formulation of finite element analysis.
- d) Assemble finite elements and understand the isoparametric element concept.
- e) Demonstrate proficiency in finite element programming.

Departmental Elective -I

Course Code	Subject Name	L-T-P	Cr.
CE-506C	Construction Project Management	3-1-0	4

Course Outcomes: At the end student will be able to learn

- a) Understand the basic forms of organization with a focus on projects.
- b) Comprehend the project life cycle and its various stages.
- c) Estimate activity cost and time using Critical Path Method (CPM) and Program Evaluation and Review Technique (PERT) techniques.
- d) Apply crashing and resource levelling methods for project control.
- e) Conduct time studies and equipment performance ratings.

Departmental Elective -I

Course Code	Subject Name	L-T-P	Cr.
CE-506D	Advanced Railway Engineering	3-1-0	4

Course Outcomes: At the end student will be able to learn

- a) Understand the historical development of railway transportation.
- b) Differentiate between various types of tractions used in railway operations.
- c) Design railway tracks considering geometric parameters such as gauge, gradient, speed, super elevation, cant deficiency, negative super elevation, curves, and length of transition curves.
- d) Implement control measures for train movements, including signals and interlocking systems.
- e) Comprehend track standards and rehabilitation measures for railway tracks.

Department of Civil Engineering
M.Tech Batch 2021-23

Departmental Elective -II

Course Code	Subject Name	L-T-P	Cr.
CE-508A	Advance Water Supply and Waste Water Management	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a)** Understand the physical, chemical, and biological parameters of water pollution.
- b)** Understand the basics of biological treatment technologies, with a focus on tertiary treatment options.
- c)** Evaluate grit removal facilities, including grit channels, vortex degritters, and cyclonic degritters.
- d)** Design and operate primary and secondary sedimentation tanks.
- e)** Design and operate UASB (Upflow Anaerobic Sludge Blanket) reactors and their modifications, including anaerobic baffled reactor and anaerobic moving bed reactor.

Department of Civil Engineering
M.Tech Batch 2021-23

Departmental Elective -II

Course Code	Subject Name	L-T-P	Cr.
CE-508B	Advance Design of Steel Structure	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a) Understand the mechanical properties of steel and their significance in structural design.
- b) Apply plastic theory and understand the plastic hinge concept.
- c) Evaluate the selection of bay width in industrial building design.
- d) Evaluate local buckling and post-buckling strength of cold-formed sections.
- e) Design short span sections and members subjected to axial tension, compression, and bending using cold-formed sections.

Departmental Elective -II

Course Code	Subject Name	L-T-P	Cr.
CE-508C	Rehabilitation of Structures	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a) Understand the concepts of maintenance, rehabilitation, repair, retrofit, and strengthening of structures.
- b) Implement health and safety precautions for handling and applying repair materials.
- c) Apply non-destructive testing techniques using instruments like the rebound hammer and ultrasonic pulse velocity.
- d) Perform repair work for various corrosion-damaged structural elements, such as slabs, beams, and columns.
- e) Apply jacketing techniques, including column jacketing, beam jacketing, beam-column joint jacketing, reinforced concrete jacketing, steel jacketing, and FRP jacketing.

Department of Civil Engineering
M.Tech Batch 2021-23

Departmental Elective -II

Course Code	Subject Name	L-T-P	Cr.
CE-508D	Analysis & Structural Design of Pavement	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a) Identify and understand the components of road pavement, including subgrade, sub-base, base course, and wearing course, and their respective functions.
- b) Analyze factors affecting pavement design, including traffic, moisture, climate, and soil characteristics.
- c) Evaluate the limitations and general observations of different pavement design methods.
- d) Design distributed steel reinforcement, dowels, and spacing of joints in rigid pavements.
- e) Evaluate the performance of pavements, utilizing road mechanics and applications, and draw conclusions from the AASHO road test.

Department of Civil Engineering
M.Tech Batch 2021-23

Departmental Elective -III

Course Code	Subject Name	L-T-P	Cr.
CE-510A	Integrated Solid Waste Management	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a) Understand the concept of the environment and the ecosystem, including their meaning, types, components, structure, and functions.
- b) Analyze the composition of solid waste and determine factors influencing its generation.
- c) Develop an understanding of collection routes and the preparation of master schedules.
- d) Analyze methods for drying and dewatering of solid waste.
- e) Recognize the necessary equipment for effective landfill operations.

Departmental Elective -III

Course Code	Subject Name	L-T-P	Cr.
CE-510B	Bridge Engineering	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a) Understand the types of bridges and their structural configurations.
- b) Familiarize with the design of pre-stressed concrete bridges, including pre-tensioned and post-tensioned designs.
- c) Evaluate loads, permissible stresses, and fluctuations of stresses in steel bridges.
- d) Design considerations for rocker and roller cum rocker bearings, sliding bearings.
- e) Design well foundations and pile foundations for piers and abutments based on specific requirements.

Departmental Elective -III

Course Code	Subject Name	L-T-P	Cr.
CE-510C	Construction Practice and Equipment	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a) Understand construction specifications, details, and the sequence of activities in construction projects.
- b) Understand techniques for large reservoir construction with membranes, well points, dewatering, and the use of plant equipment for underground open excavation.
- c) Gain knowledge about the erection of transmission towers, construction sequences in cooling towers, silos, chimneys, skyscrapers, bowstring bridges, and cable-stayed bridges.
- d) Assess materials and methods of repair and restoration in construction projects.
- e) Explore equipment for dredging, trenching, tunnelling, drilling, blasting, dewatering, pumping, and transport.

Department of Civil Engineering
M.Tech Batch 2021-23
Departmental Elective -III

Course Code	Subject Name	L-T-P	Cr.
CE-510D	Highway Planning & Geometric Design	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a) Understand the concept of a system and analyze its scope and limitations in transportation planning.
- b) Identify and analyze the design vehicle for highway planning.
- c) Evaluate the effect of grade on sight distances and intermediate sight distance.
- d) Evaluate the widening of pavement on horizontal curves and methods of introducing extra widening.
- e) Apply relevant IRC standards for urban and rural roads in the design process.

Departmental Elective -IV

Course Code	Subject Name	L-T-P	Cr.
CE-601A	Solid and Biomedical Waste Management	3-1-0	4

Course Outcomes: At the end student will be able to learn

- a) Define solid waste and distinguish between different types such as domestic, commercial, industrial, market, agricultural, biomedical, e-waste, hazardous, and institutional waste.
- b) Analyze various collection methods and tools/equipment used in solid waste management.
- c) Analyze health aspects and public involvement in solid waste management during handling, processing, segregation, recovery, recycling, and reuse.
- d) Define e-waste, identify its varieties, and understand the dangers associated with e-waste.
- e) Evaluate methods for recycling and disposing of e-waste.

Departmental Elective -IV

Course Code	Subject Name	L-T-P	Cr.
CE-601B	Advance Structure Analysis	3-1-0	4

Course Outcomes: At the end student will be able to learn

- a) Understand fundamental concepts related to structures, loads, and responses.
- b) Analyze beams with internal hinges, continuous beams, grids, and space frames using matrix methods.
- c) Analyze grids using the conventional stiffness method and reduced stiffness method.
- d) Implement the flexibility method for plane frames, ignoring axial deformations.
- e) Apply matrix methods to estimate critical elastic buckling loads and perform second-order analysis.

Department of Civil Engineering
M.Tech Batch 2021-23

Departmental Elective -IV

Course Code	Subject Name	L-T-P	Cr.
CE-601C	Rock Mechanics	3-1-0	4

Course Outcomes: At the end student will be able to learn

- a) Understand the basic terminology related to rock formation.
- b) Explore the genesis of rocks and their classification.
- c) Apply strength criteria for rocks with discontinuity sets.
- d) Design slopes and understand excavation in rock with stabilization concepts.
- e) Analyze case studies related to rock bolting and reinforcement of laminated rock.

Departmental Elective -IV

Course Code	Subject Name	L-T-P	Cr.
CE-601D	Urban Transportation Planning	3-1-0	4

Course Outcomes: At the end student will be able to learn

- a) Understand the relationship between transport and socioeconomic activities.
- b) Generate and evaluate solutions for transportation issues.
- c) Examine different modal split models, including trip-end type and trip-interchange modal split models.
- d) Explore different types of movements and surveys, including home-interview, commercial vehicle, and post-card questionnaire surveys.
- e) Explore different types of urban structures, including centripetal, grid-type, linear-type, and directional grid urban structures.

Open Electives

Course Code	Subject Name	L-T-P	Cr.
CE-603A	Remote Sensing &GIS	3-0-0	3

Open Electives

Course Code	Subject Name	L-T-P	Cr.
CE-603B	Optimization Methods in Civil Engineering	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a) Understand the role of optimization in engineering applications.
- b) Apply Linear Programming (LPP) models in design and manufacturing.
- c) Implement Newton's method for optimization.
- d) Apply optimization algorithms to engineering problems with constraints.
- e) Utilize MATLAB for solving optimization problems.

Department of Civil Engineering
M.Tech Batch 2021-23
Open Electives

Course Code	Subject Name	L-T-P	Cr.
CE-603C	Environment Impact Assessment	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a) Understand the necessity of Environmental Impact Assessment (EIA).
- b) Assess the impacts of project location, land use, and alternatives on the environment.
- c) Implement various impact identification and measurement methods, including ad-hoc methods, checklists, matrices, networks, overlays, environmental indices, and cost/benefit analysis.
- d) Predict environmental media quality during and after the project.
- e) Integrate impact assessments for a comprehensive understanding of project implications.

Open Electives

Course Code	Subject Name	L-T-P	Cr.
CE-603D	Industrial Safety	3-0-0	3

Course Outcomes: At the end student will be able to learn

- a) Understand the Manufacture, Storage, and Import of Hazardous Chemical (Amendment) Rules, 2000.
- b) Demonstrate knowledge of accident investigation, reporting, and analysis techniques.
- c) Analyze case studies related to major accident hazards in the chemical industry.
- d) Relate emergency planning and preparedness to international standards such as ISO 14001, OHSAS 18001, and OSHA's Process Safety Management System.
- e) Analyze marine and coastal pollution control strategies.

2nd Year/ 3rdSem

Course Code	Subject Name	L-T-P	Cr.
CE-651	FEM Software base Lab study	0-0-4	2

Case study by using any software available.

Course Code	Subject Name	L-T-P	Cr.
CE-661	Dissertation I	0-0-20	10

Dissertation -I

Department of Civil Engineering
M.Tech Batch 2021-23

Audit Course 1

Course Code	Subject Name	L-T-P	Cr.
AC-502A	English for Research Paper Writing	2-0-0	0

Audit Course 1

Course Code	Subject Name	L-T-P	Cr.
AC-502A	Disaster Management	2-0-0	0

Audit Course 2

Course Code	Subject Name	L-T-P	Cr.
AC-601A	Pedagogy Studies	2-0-0	0

Audit Course 2

Course Code	Subject Name	L-T-P	Cr.
AC-601B	Personality Development through Life Enlightenment Skills	2-0-0	0

Department of Civil Engineering
M.Tech Batch 2021-23

2nd Year/ 4thSem

Course Code	Subject Name	L-T-P	Cr.
CE-602	Seminar	0-0-2	1

Seminar

Course Code	Subject Name	L-T-P	Cr.
CE-622	Dissertation II	0-0-36	18

Dissertation II

SCHOOL OF COMPUTER SCIENCE

LINGAYA'S VIDYAPEETH
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
Course: Bachelor of Computer Applications (BCA)
2021 – 22

Program Education Objectives (PEOs):

- PEO-1:** Demonstrate analytical and design skills including the ability to generate creative solutions and foster team-oriented professionalism through effective communication in their careers.
- PEO-2:** Graduates would expertise in successful careers based on their understanding of formal and practical methods of application development using the concept of computer programming languages and design principles in national and international level.
- PEO-3:** Exhibit the growth of the nation and society by implementing and acquiring knowledge of upliftment of health, safety and other societal issues.
- PEO-4:** Implement their exhibiting critical thinking and problem- solving skills in professional practices or tackle social, technical and business challenges.

Program Outcomes (POs):

- PO-1:** Apply mathematics and computing fundamental and domain concepts to find out the solution of defined problems and requirements. (Computational Knowledge)
- PO-2:** Use fundamental principle of Mathematics and Computing to identify, formulate research literature for solving complex problems, reaching appropriate solutions. (Problem Analysis)
- PO-3:** Understand to design, analyze and develop solutions and evaluate system components or processes to meet specific need for local, regional and global public health, societal, cultural, and environmental systems. (Design/Development of Solutions)
- PO-4:** Use expertise research-based knowledge and methods including skills for analysis and development of information to reach valid conclusions. (Conduct Investigations of Complex Computing Problems)

PO-5: Use expertise research-based knowledge and methods including skills for analysis and development of information to reach valid conclusions. (Conduct Investigations of Complex Computing Problems)

PO-6: Exhibiting ethics for regulations, responsibilities and norms in professional computing practices. (Professional Ethics)

PO-7: Enlighten knowledge to enhance understanding and building research, strategies in independent learning for continual development as computer applications professional. (Life-long Learning)

PO-8: Establishing strategies in developing and implementing ideas in multi-disciplinary environments using computing and management skills as a member or leader in a team. (Project Management and Finance)

PO-9: Contribute to progressive community and society in comprehending computing activities by writing effective reports, designing documentation, making effective presentation, and understand instructions. (Communication Efficacy)

PO-10: Apply mathematics and computing knowledge to access and solve issues relating to health, safety, societal, environmental, legal, and cultural issues within local, regional and global context. (Societal and Environmental Concern)

PO-11: Gain confidence for self and continuous learning to improve knowledge and competence as a member or leader of a team. (Individual and Teamwork)

PO-12: Gain confidence for self and continuous learning to improve knowledge and competence as a member or leader of a team. (Individual and Teamwork.)

Program Specific Outcomes (PSOs):

PSO-1: Analyse their abilities in systematic planning, developing, testing and executing complex computing applications in field of Social Media and Analytics, Web Application Development and Data Interpretations.

PSO-2: Apprise in-depth expertise and sustainable learning that contributes to multi-disciplinary creativity, permutation, modernization and study to address global interest.

**BCA 1st Year
I Semester**

BCA-101	COMPUTER PROGRAMMING	L-T-P	Cr
		4-0-0	4

OBJECTIVE

To introduce the students the basic of C and Logic behind the implementation of different features of C like different data types , function, array, control statements, pointers, structures, file processing and recursion.

COURSE OUTCOMES

The student after undergoing this course will be able:

CO1: To know the different programming languages

CO2: To learn the basic concepts of C programming language

CO3: To learn the concepts of different control statements

CO4: To know about different data types and the ways of handling

CO5: To store the data in a file type and how to maintain it

BCA-103	INTERNET AND WEB DEVELOPMENT	L-T-P	Cr
		4-0-0	4

OBJECTIVE

It aims to provide students will be familiarized with Internet Structure and with the basic protocols which provides knowledge of a proficiency in basic techniques for the development of Web-based applications.

Pre-Requisites:

Knowledge of Web, and basics of Computer and Internet.

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To know about the web and web hosting

CO2: To create their own website using HTML

CO3: To learn to make the dynamic website using CSS

CO4: To understand the client side programming using

Javascript CO5: To aware about the search engine and its optimization

BCA-105	COMPUTER FUNDAMENTALS & EMERGING TECHNOLOGY	L-T-P	Credits
		3-0-0	3

OBJECTIVE

To introduce the basic concepts of computers as well as different emerging technologies.

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To know the history, different types came into existence via generations of the computer

CO2: To understand the different hardware and their usage

CO3: To learn the different number systems and their conversions

CO4: To learn about the operating system and its need

CO5: To know about the different technologies to be emerged in different areas

BS-107	MATHEMATICS-I	L-T-P	Credits
		3-1-0	4

OBJECTIVE

To introduce the basics concept of mathematics

COURSE OUTCOMES

The students undergoing this course will able:

CO1: To learn about limit, continuity as well as discontinuity
CO2: To state about the matrices and its applications

CO3: To learn about the infinite series

CO4: To know about the differentiation, partial differentiation and its applications

CO5: To aware about the different concepts of integration

HSS-107	ENGLISH & COMMUNICATION SKILLS	L-T-P	Cr.
		3-0-0	3

OBJECTIVE

To make students understand the concepts related to language development communication skills.

COURSE OUTCOMES

The students undergoing the course will be able:

CO1: To know the basic structure of speech

CO2: To learn about oral communication and role of speech organs in it

CO3: To get knowledge about the writing skills

CO4: To be skillful in writing different applications as well as letters

CO5: To know all about comprehension

MG-111	ACCOUNTING AND FINANCIAL MANAGEMENT	L	T/SDA	P	CR
		3	0	0	3

COURSE OBJECTIVES:

1. To give an insight into the basics of Accounting Concepts
2. To study the principles of accounts.
3. To enable the students to prepare different kinds of Financial Statements
4. To learn to manage the financial accounts

PROGRAM OUTCOMES (POs):

Upon successful completion of this course, the student will be able to:

PO1: Acquire conceptual knowledge of basics of accounting

PO2: Identify events that need to be recorded in the accounting records

PO3: Develop the skill of recording financial transactions and preparation of reports in accordance with GAAP

PO4: Describe the role of accounting information and its limitations

PO5: Equip with the knowledge of accounting process and preparation of final accounts of sole trader

PO6: Identify and analyze the reasons for the difference between cash book and pass book balances

PO7: Recognize circumstances providing for increased exposure to errors and frauds

PO8: Determine the useful life and value of the depreciable asset

1. , “Managerial finance”, Dryden press, 1988

BCA-151	COMPUTER PROGRAMMING LAB	L-T-P	Cr.
		0-0-2	1

OBJECTIVE

To implement different aspects of C Language using different control statements and loops as well as different storage structures like arrays, strings and files.

COURSE OUTCOMES

The student after undergoing this course will be able:

CO1: To implement the different control statements like sequential, conditional & loops

CO2: To learn the basic concepts of C programming language

CO3: To learn the concepts of different control statements

CO4: To know about different data types and the ways of handling

CO5: To store the data in a file type and how to maintain it

BCA-153	INTERNET AND WEB DEVELOPMENT LAB	L-T-P	Cr
		0-0-2	1

OBJECTIVE:

It aims to make students to make them skillful in creating and handling web based applications like websites etc.

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To know and use different HTML tags

CO2: To create different lists in a webpage or website

CO3: To create their own website

CO4: To learn to make the dynamic website using CSS

CO5: To understand the client side programming using Javascript

BCA-157	PERSONAL COMPUTER SOFTWARE LAB	L-T-P	Cr
		0-0-2	1

OBJECTIVE

To make the students computer savvy via introducing different basic applications like MS-office

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To learn all windows based commands

CO2: To expertise in making documents using MS- Word

CO3: To handle in handling database by creating spreadsheets using MS-Excel

CO4: To manage the data via sorting, filtering etc.

CO5: To be expert in presentations using MS-Powerpoint

**Syllabus of BCA
IInd Semester**

BCA-102	DATA STRUCTURES USING C	L-T-P	Cr
		4-0-0	4

OBJECTIVE

To relay the theoretical and practical fundamental knowledge of most commonly used Data Structures.

PRE-REQUISITES

Knowledge of basic computer programming

COURSE OUTCOMES

CO1: Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.

CO2: Understand basic data structures such as arrays, linked lists, stacks and queues. **CO3:** Describe the hash function and concepts of collision and its resolution

methods **CO4:** Solve problem involving graphs, trees and heaps

CO5: Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data

1. Weiss, "Data Structures and Algorithms Analysis in C", Pearson Education, 2000

BCA-104	OBJECT ORIENTED PROGRAMMING USING C++	L-T-P	Cr
		4-0-0	4

OBJECTIVE

To build programming logic and thereby developing skills in problem solving using C++ programming language; Introduce the concept of object orientation and on how to handle data in different forms; Emphasize the concepts and constructs rather than on language features.

COURSE OUTCOMES

CO1: Describe the procedural and object-oriented paradigm with concepts of streams, classes, functions, data and objects.

CO2: Understand dynamic memory management techniques using pointers, constructors, destructors, etc

CO3: Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.

CO4: Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.

CO5: Demonstrate the use of various OOPs concepts with the help of programs.

BCA-106	DISCRETE STRUCTURE	L T P	Cr
		3 0 0	3

OBJECTIVE

To lay mathematical foundation for the fundamentals of various computational structures such as Boolean algebra, propositional logic, graph and trees.

COURSE OUTCOMES

CO1: Perform operations on various discrete structures such as sets, functions, relations, and sequences.

CO2: Ability to solve problems using Counting techniques, Permutation and Combination, Recursion and generating functions.

CO3: Apply algorithms and use of graphs and trees as tools to visualize and simplify Problems. **CO4:** Apply algorithms and use of graphs and trees as tools to visualize and

simplify Problems. **CO5:** Understand the various properties of algebraic systems like Rings, Monoids and Groups.

EC-108	DIGITAL ELECTRONICS	L T P	CR
		4 0 0	4

OBJECTIVE

Modern world deals with digital conditioning of various signals. Digitally manipulating signals or using digital circuits have a lot of advantages in terms of accuracy etc. This subject introduces concept of basic digital electronics: gates; combinational and sequential circuits and their designing.

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1:** Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
- CO2:** To understand and examine the structure of various number systems and its application in digital design.
- CO3:** The ability to understand, analyze and design various combinational and sequential circuits.
- CO4:** Ability to identify basic requirements for a design application and propose a cost effective solution.
- CO5:** The ability to identify and prevent various hazards and timing problems in a digital design.

BS-118	COMPUTATIONAL MATHEMATICS-II	L T P	CR
		3-1-0	4

COURSE OUTCOMES

- CO1:** Perform operations on various discrete structures such as sets, functions, relations, and sequences.
- CO2:** Ability to solve problems using Counting techniques, Permutation and Combination, Recursion and generating functions.
- CO3:** Apply algorithms and use of graphs and trees as tools to visualize and simplify Problems.
- CO4:** Apply algorithms and use of graphs and trees as tools to visualize and simplify Problems.
- CO5:** Understand the various properties of algebraic systems like Rings, Monoids and Groups.

CE-108	ENVIRONMENTAL SCIENCE & ECOLOGY	L T P	CR
		2-0-0	2

OBJECTIVES

- The aim of the course is to make everyone aware of environment issues like continuing problems of pollution, loss of forest, solid waste disposal and degradation of environment.
- Issues like economic productivity and national security, global warming, the depletion of ozone layer and loss of biodiversity are other serious concerns before the mankind.

COURSE OUTCOMES

CO1: Conceptualize the processes and various factors involved in the formation of environment.

CO2: Recognize the importance of environment and the sustainable of natural resources.

CO3: Analyze interaction between social and environmental processes.

CO4: Use scientific reasoning to identify and understand environment problems and evaluate potential solutions.

CO5: Visualize the impacts of human activities on environment and role of society in these impacts.

BCA-152	DATA STRUCTURES USING C LAB	L-T-P	Cr
		0-0-2	1

COURSE OUTCOMES

CO1 Be able to design and analyze the time and space efficiency of the data structure

CO2 Be capable to identify the appropriate data structure for given problem

CO3 Have practical knowledge on the applications of data structures

BCA-154	OBJECT ORIENTED PROGRAMMING USING C++ LAB	L-T-P	Cr
		0-0-2	1

COURSE OUTCOMES

CO1: Develop solutions for a range of problems using objects and classes.

CO2: Programs to demonstrate the implementation of constructors, destructors and operator overloading.

CO3: Apply fundamental algorithmic problems including type casting, inheritance, and polymorphism.

CO4: Understand generic programming, templates, file handling.

BCA-158	MATLAB	L T P	Cr
		0-0-2	1

OBJECTIVE

MATLAB is a powerful language for technical computing. It is widely used in universities and colleges for courses in mathematics, science and especially in engineering. In industry the software is used in research, development and design. This course is intended for students who are using MATLAB for the first time and have little or no experience in computer programming.

COURSE OUTCOMES

After undergoing this course, the students will be able to:

CO1: Know the basic concepts of MATLAB

CO2: Learn about the arrays as well as strings

CO3: Handle the script files and different output commands used in running a script file

CO4: State the plotting as well as draw a graph

CO5: Handle different function files

BCA 2nd Year
3rd Semester

BCA-201	OPERATING SYSTEMS	L T P	Cr
		4-0-0	4

OBJECTIVE

To provide the knowledge of internals, different types and purpose of operating systems

PRE-REQUISITES

Knowledge of computer organization and architecture, programming skills

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To get familiar with the basic concepts of operating system

CO2: To know about the multiprocessing, synchronization & deadlocks

CO3: To learn the strategy to manage the memory available

CO4: To learn the concepts of files, their accession and disk scheduling

CO5: To know about the hardware devices and drivers used for them

BCA-203	COMPUTER ARCHITECTURE AND ORGANIZATION	L T P	Cr
		4-0-0	4

OBJECTIVE

To provide basic knowledge of internals of microprocessor, its architecture, components, terminologies, etc. at minute level and ultimately about the working of a digital computer hardware as a whole.

PRE-REQUISITES

Knowledge of data structures, microprocessors and interfacing

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To learn the basic architecture of the computer

CO2: To learn about the different addresses and instructions passed for

CO3: To know about the different types of architecture & instruction cycle

CO4: To get knowledge about the different types of memories and their hierarchies

CO5: To know about the parallel processing

BCA-205	MULTIMEDIA TECHNOLOGIES	L T P	Cr
		4-0-0	4

OBJECTIVE

To provide basic knowledge of image compression, audio, video, sound, virtual reality, intelligent multimedia systems etc.

PRE-REQUISITES

Knowledge of computer graphics, programming, 3D geometry

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To get familiar with different types of media

CO2: To know about the network of multimedia distribution as well as animations

CO3: To learn about different types of images, color models etc.

CO4: To learn about different signals and digital sound

CO5: To know how to add motion in pictures leads to a video

BCA-207	COMPUTER NETWORKS	L T P	Cr
		3-0-0	3

OBJECTIVE

To have a fundamental understanding of the design, performance and state of the art of wireless communication systems, Topics covered include state of the art wireless standards and research and thus changes substantially form one offering of this course to the next

PRE-REQUISITES

Knowledge of computers hardware and software

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To know different types of networks and basic architecture of network

CO2: To learn about different network models

CO3: To know deeply about the local area

network **CO4:** To know deeply about the wide
area network

CO5: To aware about application layer of network models

BCA-209	CORE JAVA	L T P	Cr
		4-0-0	4

OBJECTIVE

To relay the theoretical and practical knowledge of Java programming language

PRE-REQUISITES

Basic Knowledge of programming language and object oriented programming

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To learn about the basics of objects, object behavior & storage of different objects

CO2: To know about the basics of Java programming language

CO3: To learn how to create a package as well as handling of exceptions

CO4: To learn about the multithreading as well as synchronization of threads to
avoid deadlocks

CO5: To aware about the database connectivity using JDBC as well as other APIs

BCA-211	DATABASE MANAGEMENT SYSTEM	L-T-P	Cr
		4-0-0	4

OBJECTIVE

To provide knowledge about various organizations and management information systems, keeping in view the aspects of shareability, availability, evolvability and integrity.

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To know the basics of database & its architecture

CO2: To aware about the existing data models, entities as well as constraints

CO3: To learn about the different anomalies of the data and ways to normalize

it **CO4:** To know about the storage of data in the files & organization of files

CO5: To learn about the transactions and its ways done on the database

BCA-255	MULTIMEDIA TECHNOLOGIES LAB	L T P	Cr
		0-0-2	1

OBJECTIVE

To provide practical knowledge of concepts of different medias.

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To get familiar with different types of media

CO2: To implement the motion in still images

CO3: To learn about shape tweening of objects & alphabets

CO4: To use the macromedia flash

CO5: To know how to add text in the file

BCA-259	CORE JAVA LAB	L T P	Cr
		0-0-2	1

OBJECTIVE

To relay the practical knowledge of Java programming language

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To learn about operators used in Java Programming

CO2: To know about loops implemented in Java programming language

CO3: To implement the arrays and strings

CO4: To learn about the inheritance, packages & exception

handling **CO5:** To aware about the database connectivity using

JDBC

BCA-261	DATABASE MANAGEMENT SYSTEM LAB	L-T-P	Cr
		0-0-2	1

OBJECTIVE

To provide knowledge about implementation of practical aspects of database i.e. creation of tables and applying queries using SQL queries

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To know the basics of structured query language

CO2: To aware about applying different queries on database structured in the form of tables

CO3: To learn about the different SQL queries performed using operators as well as constraints

CO4: To create views from created table to further organize the data

CO5: To learn about the basic operations of relational algebra

BCA 2nd Year
4th Semester

BCA-202	COMPUTER GRAPHICS	L T P	Cr
		4 0 0	4

OBJECTIVES

- Write programs Using C/C++/ OpenGL graphics environment.
- Use polygonal and other modelling methods to describe scenes.
- Understand and be able to apply geometric transformations.
- Create basic animations.

PRE-REQUISITES

Knowledge of computer programming

COURSE OUTCOMES

Students after undergoing this course will be able to:

CO1: Understand the basics of computer graphics, different graphics systems and applications of computer graphics.

CO2: Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.

CO3: Use of geometric transformations on graphics objects and their application in composite form.

CO4: Extract scene with different clipping methods and its transformation to graphics display device.

CO5: Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.

BCA-204	DESIGN & ANALYSIS OF ALGORITHMS	L T P	Cr
		4 0 0	4

OBJECTIVE

To relay the theoretical and practical aspects of design of algorithms.

PRE-REQUISITES

Knowledge of fundamentals of basic computer programming for implementing algorithms.

COURSE OUTCOMES

CO1: Define the basic concepts of algorithms and analyze the performance of algorithms.

CO2: Discuss various algorithm design techniques for developing algorithms.

CO3: Discuss various searching, sorting and graph traversal algorithms.

CO4: Understand NP completeness and identify different NP complete problems.

CO5: Discuss various advanced topics on algorithms.

BCA-206	LINUX AND SHELL PROGRAMMING	L-T-P	Cr
		3-0-0	3

OBJECTIVE

The objective of the course aims to introduce about open source operating system as We can use Linux as Server OS or as standalone OS on our PC, Shell scripting & IPC etc.

COURSE OUTCOMES

CO1: Students will be able to understand the basic commands of Linux operating system and can write shell scripts

CO2: Students will be able to create file systems and directories and operate them

CO3: Students will be able to create processes background and fore ground etc.. by fork() system calls

CO4: Students will create shared memory segments, pipes, message queues and can exercise inter-process communication

BS-220	APPLIED NUMERICAL TECHNIQUES	L-T-P	Credits
		3-0-0	3

OBJECTIVE

To acquaint the students with the various concepts and tools of applied mathematics which will be very basic and the very soul and guide of various engineering subject.

COURSE OUTCOMES

Students undergoing this course will be able to:

CO1: It is used for solving a system of equations

CO2: To know how to find the roots of transcendental equations.

CO3: To learn how to interpolate the given set of values

CO4: To understand the curve fitting for various

polynomials **CO5:** To learn numerical solution of differential equations

BCA-210	IT MANAGEMENT	L T P	CR
		3 0 0	3

OBJECTIVE

The objective of the course aims to introduce about Information technology plays an important role in today's business world. Majority of the companies rely on this for the purpose of data processing, fast communications and acquiring market intelligence. Information technology helps business improve the processes of business it drives revenue growth, helps them achieve cost efficiency and more importantly, ensures they increase revenue growth while maintaining a competitive edge in the market place

COURSE OUTCOMES

CO1: Understand the concepts related to Business.

CO2: Demonstrate the roles, skills and functions of management.

CO3: Analyze effective application of PPM knowledge to diagnose and solve organizational problems and develop optimal managerial decisions.

CO4: Understand the complexities associated with management of human resources in

the organizations and integrate the learning in handling these complexities.

BCA-212	RAPID APPLICATION DEVELOPMENT	L T P	Cr
		3 1 0	4

OBJECTIVE

The course on RAD focuses on building applications within a very short time period. After successful completion of this course the students will be able to obtain a firm foundation on RAD concepts and methodologies and acquire sufficient working knowledge in RAD tools.

PRE-REQUISITES

Knowledge of programming in C, C++, JAVA

COURSE OUTCOMES

CO1: Understand various strategies for rapid application development (e.g. Agile, Extreme, Joint, Lean, Scrum, Spiral)

CO2: Understand the role of scalability in RAD and available solutions (e.g. cloud solutions from Google, Amazon, Microsoft)

CO3: Understand the advantages and disadvantages of using platform independent data storage techniques (e.g. Java Data Objects, Java Persistence API) and platform dependent data storage techniques (e.g. Google Datastore)

CO4: Proficiently use the programming language within the strategies for RAD.

CO5: Create a rapid prototype for the user interface of an IT application

BCA-252	COMPUTER GRAPHICS LAB	L T P	Cr
		0 0 2	1

COURSE OUTCOMES

CO1: Understand the basic concepts of computer graphics.

CO2: Design scan conversion problems using C++ programming.

CO3: Apply clipping and filling techniques for modifying an object.

CO4: Understand the concepts of different type of geometric transformation of objects in 2D and 3D.

CO5: Understand the practical implementation of modeling, rendering, viewing of objects in 2D.

BCA-256	LINUX & SHELL PROGRAMMING LAB	L T P	Cr
		0 0 2	1

COURSE OUTCOMES

CO1 Demonstrate the installation process of various operating systems.

CO2 Implement virtualization by installing Virtual Machine software

CO3 Apply UNIX/LINUX operating system commands.

CO4 Understand different UNIX/LINUX shell scripts and execute various shell programs

BCA-262	RAPID APPLICATION DEVELOPMENT LAB	L T P	Cr
		0 0 2	1

COURSE OUTCOMES

CO1: Implementation of the platform independent data storage techniques (e.g. Java Data Objects, Java Persistence API) and platform dependent data storage techniques (e.g. Google Datastore)

CO2: Proficiently use the programming language within the strategies for RAD.

CO3: Create a rapid prototype for the user interface of an IT application

BCA 3rd Year
5th Semester

BCA-301	SOFTWARE ENGINEERING PRINCIPLES	L T P	Cr
		4-0-0	4

OBJECTIVE

To provide basic knowledge of properties of software and its development processes, software quality, CASE tools, etc.

PRE-REQUISITES

Knowledge of computer programming, principles of management

COURSE OUTCOMES

The students undergoing this course will be able:

- CO1:** To learn the basic concepts of software engineering
- CO2:** To know about the requirements and process to engineer the software
- CO3:** To learn how to design a software & what are its strategies
- CO4:** To aware about the coding, testing & maintenance of software
- CO5:** To know about different metrics used for software evaluation

BCA-303	PROGRAMMING USING C#	L-T-P	Cr
		4-0--0	4

OBJECTIVE

To equip students with C# programming Concepts

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To know the basics of Dot net programming language

CO2: To aware about different programming languages via differences &

comparison CO3: To learn about the basics of C# programming

CO4: To know about the different statements and controls in C# programming

CO5: To learn about different database connectivity's like ADO etc.

BCA-305	ARTIFICIAL INTELLIGENCE	L T P	Cr
		4-0-0	4

OBJECTIVE

To introduce about artificial intelligence approaches to problem solving, various issues involved and application areas

PRE-REQUISITES

Knowledge of neural networks, data structures

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To know the basics of artificial intelligence

CO2: To learn the different searching techniques of artificial intelligence

CO3: To learn about the representation of different information to produce a system

CO4: To know about different logics used

CO5: To aware about the uncertainties

BCA-307	INTRODUCTION TO E-COMMERCE	L T P	Cr
		3-0-0	3

OBJECTIVE

To give the students knowledge about the e-business and transactions done electronically

Pre-Requisites

Knowledge of internet and web development, data mining, computer networks, software engineering.

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To learn the basic concepts of e-commerce

CO2: To aware about the infrastructure required in e-commerce

CO3: To know about the payment system operated

electronically CO4: To aware about e-business and its related aspects

CO5: To learn about e-commerce

BCA-353	PROGRAMMING USING C# LAB	L-T-P	Cr
		0-0-2	2

OBJECTIVE

To train the students with C# programming Concepts using implementation

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To know the basics of Dot net programming

language CO2: To implement operators used in C#

Programming CO3: To learn about constructors to be implemented

CO4: To know about the different functions & file operations in C# programming

CO5: To learn about different database connectivity's like ADO etc.

BCA-355	ARTIFICIAL INTELLIGENCE LAB	L T P	Cr
		0-0-2	1

OBJECTIVE

To introduce about artificial intelligence approaches to problem solving, various issues involved and application areas

PRE-REQUISITES

Knowledge of neural networks, data structures

COURSE OUTCOMES

The students undergoing this course will be able:

CO1: To know the basics of prolog programming language

CO2: To learn the different iterative structures using prolog

CO3: To learn about different problems and solution by

prolog CO4: To know about different searching methods

CO5: To aware about the natural language processing

BCA-371	MINOR PROJECT	L T P	Cr
		0-0-8	4

OBJECTIVE

The student shall be capable of identifying a problem related to the program of study and carry out wholesome research on it leading to findings which will facilitate development of a new/improved product, process for the benefit of the society.

The projects should be socially relevant and research oriented ones. Student is expected to do an individual project or in group of 3 members. The project work is carried out in two phases – Minor Project in V semester and Major Project in VI semester. Major project of the project work shall be in continuation of Minor Project only. At the completion of a project the student will submit a project report, which will be evaluated (end semester assessment) by duly appointed examiner(s). This evaluation will be based on the project report and a viva voce examination on the project. Student will be allowed to appear in the final viva voce examination only if he / she has submitted his / her project work in the form of paper for presentation / publication in a conference / journal and produced the proof of acknowledgement of receipt of paper from the organizers / publishers.

BCA 3rd Year
6th Semester

BCA-302	SOFTWARE PROJECT MANAGEMENT	L T P	Cr
		3 0 0	3

OBJECTIVE

To provide the foundation required for becoming a good software project manager by means of planning, evaluation and estimation, risk management, allocation and monitoring of resources, controlling software quality PRE-REQUISITES Knowledge of software engineering and the basic principles of management

COURSE OUTCOMES

The students after undergoing this course will be able to:

CO1: Identify the different project contexts and suggest an appropriate management strategy.

CO2: Practice the role of professional ethics in successful software development.

CO3: Identify and describe the key phases of project management.

CO4: Determine an appropriate project management approach through an evaluation of the business context and scope of the project.

CO5: Methods to Maintain the Software Quality Assurance

BCA-304	NEURAL NETWORK	L T P	Cr
		4 0 0	4

OBJECTIVE

To study various algorithms and their implementation in real life and in different domains.

PRE-REQUISITES

Knowledge of Applied Mathematics and basic calculation techniques of matrices.

COURSE OUTCOMES

The students undergoing this course will be able to:

CO1: Model Neuron and Neural Network, and to analyze ANN learning, and its applications

CO2: Perform Pattern Recognition, Linear classification.

CO3: Develop different single layer/multiple layer Perception learning algorithms

CO4: Design of another class of layered networks using deep learning principles.

BCA-306	CRYPTOGRAPHY AND DATA COMPRESSION	L T P	Cr
		3 0 0	3

OBJECTIVE

The course will provide a down-to-earth overview of cryptographic techniques applicable in an IT environment, and outline the constraints and limitations of realistic secure systems. A running theme is the tradeoff between usability and security of a system. Also covered are a number of compression techniques - data compression and data encryption are, in some respects, closely related. A working knowledge of C is assumed and essential.

COURSE OUTCOMES

CO1: Understand and analyze public-key cryptography, RSA and other public-key cryptosystems

CO2: Analyze and design hash and MAC algorithms, and digital signatures.

CO3: Design network application security schemes, such as PGP, S/ MIME, IPSec, SSL, TLS, HTTPS, SSH, etc.

CO4: Understand key management and distribution schemes and design User Authentication Protocol

CO5: Know about Intruders and Intruder Detection mechanisms, Types of Malicious software, Firewall Characteristics, Types of Firewalls, Firewall Location and Configurations.

BCA-308	PYTHON PROGRAMMING	L-T-P	Cr
		3-0-0	3

OBJECTIVE

To build programming logic and thereby developing skills in problem solving using Python programming language; To be able to do testing and debugging of code written in Python Emphasize the concepts and constructs rather than on language features.

COURSE OUTCOMES

The students undergoing this course will be able to:

CO1: To learn and understand Python programming basics and paradigm.

CO2: To learn and understand python looping, control statements and string manipulations.

CO3: Students should be made familiar with the concepts of GUI controls and designing GUI applications.

CO4: To learn and know the concepts of Structure and Functions.

CO5: To learn and know the concepts of file handling, exception handling and database connectivity.

BCA-310	ELECTIVE – II (BIG DATA ANALYSIS)	L T P	Cr
		3 0 0	3

OBJECTIVE

The basics of Hadoop, the basics of Analytics – Concepts, Data preparation – merging, managing missing numbers sampling, Data visualization and Basic statistics.

COURSE OUTCOMES

The students undergoing this course will be able to:

CO1: Identify Big Data and its Business Implications.

CO2: List the components of Hadoop and Hadoop Eco-

System **CO3:** Access and Process Data on Distributed File

System **CO4:** Manage Job Execution in Hadoop Environment

CO5: Develop Big Data Solutions using Hadoop Eco System

CO6: Analyze Infosphere Big Insights Big Data

Recommendations **CO7:** Apply Machine Learning Techniques using R

BCA-354	NEURAL NETWORK LAB	L T P	Cr
		0 0 2	1

COURSE OUTCOMES

CO1: Implement the Neuron and Neural Network, and to analyze ANN learning, and its applications

CO2: Implement and Perform Pattern Recognition, Linear classification.

CO3: Develop different single layer/multiple layer Perception learning algorithms

BCA-358	PYTHON PROGRAMMING LAB	L T P	Cr
		0 0 2	1

COURSE OUTCOMES

CO1 Define and demonstrate the use of built-in data structures “lists” and “dictionary”.

CO2 Design and implement a program to solve a real-world problem

CO3 Design and implement GUI application and how to handle exceptions and files.

CO4 Make database connectivity in python programming language.

BCA-372	MAJOR RESEARCH PROJECT	L-T-P	CR
		0-0-10	5

OBJECTIVES

1. Identify and discuss the role and importance of research in the emerging Technology and Engineering
2. Ability to synthesize knowledge and skills previously gained and applied to an in-depth study and execution of new technical problem
3. Capable to select from different methodologies, methods and forms of analysis to produce a suitable research design, and justify their design.
4. Ability to present the findings of their technical solution in a written report.
5. Presenting the work in International/ National conference or reputed journals

COURSE OUTCOMES

After undergoing this course, the students will be able to:

CO1: Develop aptitude for research and independent learning.

CO2: Demonstrate the ability to carry out literature survey and select unresolved problems in the domain of the selected project topic

CO3: Gain the expertise to use new tools and techniques for the design and development.

CO4: Acquire the knowledge and awareness to carry out cost-effective and environment friendly designs.

CO5: Develop the ability to write good technical report, to make oral presentation of the work, and to publish the work in reputed conferences/journals.



Department of Computer Science & Engineering

Course: Master of Technology MTech (CS)

Batch:2021-2023

Program Education Objectives (PEOs):

PEO1: Demonstrate competency in different fields of Computer Science and Engineering and mastery in one of the sub-fields including emerging areas.

PEO2: Demonstrate the requisite breadth and depth of knowledge in advanced areas of Computer Science and Engineering and also demonstrate problem solving skills to excel in research-centric industry and academic environments.

PEO3: Exhibit communication, collaboration, and leadership skills required to function effectively in varied, dynamic and multi-member teams.

PEO4: Develop an aptitude for self-learning and life-long learning so as to keep abreast with rapidly evolving technologies.

PEO5: Practice ethics and human values in their profession.

Program Outcomes (POs):

PO1 Knowledge Assimilation: Dissect and understand concepts from varied disciplines including Computer Science, Mathematics, and Sciences, and inter-relate various facets of knowledge.

PO2 Analysis & Optimization: Identify, formulate and analyze complex engineering problems to reach optimal solutions using relevant bodies of knowledge, including Computer Science, Mathematics, Natural Sciences and Engineering Sciences.

PO3 Envision and build solutions: Identify and bring to fore the necessary concepts from Computer Science and envision futuristic and lasting solutions.

PO4 Insightful inquiry into problems: Interpolate and extrapolate based on existing knowledge base and self-learning skills to investigate the dynamics of complex problems and find innovative solutions.

PO5 Modern tool development and usage: Demonstrate requisite hands-on skills to develop and work with a variety of software packages, libraries, programming languages, and software development environment tools useful in engineering large scale systems

PO6 The engineer and society: Make judicious use of resources and understand the impact of technology across the societal, ethical, environmental, and economic aspects.



PO7 Environment and sustainability: Find advanced technological solutions by considering the environmental impact for sustainable development

PO8 Ethics: Practice principles of professional ethics and make informed decisions after a due impact analysis.

PO9 Individual and team-work: Work efficiently as an individual and provide leadership in team-oriented projects of varying sizes, cultural milieu, professional accomplishments, and technological backgrounds.

PO10 Communication: Effectively communicate and exchange ideas and solutions to any individual including peers, end-users, and other stakeholders.

PO11 Project management and Finance: Apply the principles of project management and software project management, with focus on issues such as the life cycle, scoping, costing, and development.

PO12 Self-learning and Life-long learning: Exhibit the aptitude for independent, continuous, and life-long learning required to meet professional and career goals.

Program Specific Outcomes (PSOs):

PSO 1: Demonstrate competence in core areas of Computer Science and Engineering, including algorithms, system building, computational thinking.

PSO 2: Exhibit specialized knowledge in any one or more of the sub-areas of Computer Science and Engineering such as Cyber-Physical Systems (CPS), AI&ML, Theoretical Computer Science, Information Security, and Computer Systems.

PSO 3: Demonstrate advanced end-to-end problem-solving skills to conceptualize, analyse, design, envision, build, and deploy software systems of varying scales.

PSO 4: Possess the requisite breadth, depth, and skills needed to excel in research-driven environments.

M.Tech(CS)

**1st Year 1st
Semester**

CS-501	BIG DATA ANALYTICS	L-T-P	Cr
		4-0-0	4

OBJECTIVES

This course brings together several key big data technologies used for storage, analysis and manipulation of data and recognize the key concepts of Hadoop framework, MapReduce, Pig, Hive, and No-SQL and a sample project in Hadoop API.

COURSE OUTCOMES

The students undergoing this course will be able to:

CO1: Learn the basic concepts of big data

CO2: Handle the big data as well as get familiar with the

Hadoop **CO3:** Get deeper knowledge of Hadoop as well as map

reduce **CO4:** Know about the architecture for real time

applications **CO5:** Learn about the Pig

CS-503	OBJECT ORIENTED DESIGN AND ANALYSIS	L-T-P	Cr
		3-0-0	3

OBJECTIVES

This course brings together several key features of object oriented related to design and analysis.

COURSE OBJECTIVES

After undergoing this course, the students will be able to:

CO1: Know about the fundamentals of object oriented design

CO2: Analyze the object oriented key features like behavior, design etc

CO3: Learn the basic concepts of UML

CO4: Learn about the USE-CASES, their designs as well as their implementation

CO5: Know about the testing and coding for design of object-oriented



CS-505	ADVANCED DATA STRUCTURES AND ALGORITHMS	L T P	Cr
		3 0 0	3

OBJECTIVES

To learn about the time complexity of algorithms and understand the representations used in heap data structures, different types of search structures and various algorithm design techniques. Understand the advanced data structures.

COURSE OUTCOMES

The students undergoing this course will be able to:

CO1: Know about the data types as well as measures of complexity of algorithms

CO2: Get knowledge about heaps and its different types

CO3: Get familiar with the BST and its types

CO4: learn about the dynamic programming

CO5: learn about the approaches used for parallel algorithms

CS-555	ADVANCED DATA STRUCTURE & ALGORITHM LAB	L T P	Cr
		0 0 4	2

OBJECTIVES

Implement advanced data structures and advanced algorithm concepts. Calculate the time complexity of algorithms and express it using appropriate notations and implement different algorithm design techniques.

COURSE OUTCOMES

CO1 Be able to design and analyze the time and space efficiency of the data structure

CO2 Be capable to identify the appropriate data structure for given problem

CO3 Have practical knowledge on the applications of data structures



CS-507	Elective – II (MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE)	L T P	Cr
		3 0 0	3

COURSE OBJECTIVES

Study the fundamental concepts of logic, abstract algebra, linear algebra, probability and statistics, graph theory etc.

COURSE OUTCOMES

- The students undergoing this course will be able to:
- CO1:** know the mathematical concepts of computer science
 - CO2:** Learn about the permutations and combinations
 - CO3:** Get knowledge about the different algebraic structures and substructures
 - CO4:** Learn how the functions work recursively
 - CO5:** Know about the lattices as well as Boolean algebra

CS-509	ELECTIVE I (ADVANCED DATABASE MANAGEMENT SYSTEM)	L T P	Cr
		3 0 0	3

OBJECTIVES

To provide a comprehensive study of Relational, Distributed and Advanced Database technologies.

COURSE OUTCOMES

- The students undergoing this course will be able to:
- CO1:** Learn about the query processing and normalization
 - CO2:** Know about different storage structures like indexes, sorting etc
 - CO3:** Learn about the distributed databases and their architecture
 - CO4:** Get knowledge about the different object oriented databases
 - CO5:** Learn about the different data models used for big data

RM-501	Elective – I (RESEARCH PROCESS AND METHODOLOGY)	L- T- P	Cr
		3- 1 - 0	4

COURSE OBJECTIVES

- The students undergoing this course will be able to:
- CO1:** Know about the research problem, its objectives and approaches of research
 - CO2:** Learn about plagiarism and ethics of research
 - CO3:** How to create a good research proposal
 - CO4:** Learn about the patents as well as copyrights
 - CO5:** Know about the patents deeply



AM-501	ELECTIVE II (ADVANCED ENGINEERING MATHEMATICS)	L- T- P	Cr
		3- 1 - 0	4

COURSE OUTCOMES

The undergoing this course will be able to:

- CO1: Know about integration as well as differential equations
- CO2: Learn about the Laplace transform, its inverse as well as applications
- CO3: State different statistical methods like interpolation, extrapolation etc.
- CO4: Learn about the different numerical methods for integration
- CO5: Key aspects used in differential equations

Syllabus

Of M.Tech(CS)

1st Year 2nd Semester

CS-502	TRENDS IN AI AND SOFT COMPUTING	L	T	P	Credit
		3	0	0	3

OBJECTIVES

1. To introduce the concepts and techniques of building blocks of Artificial Intelligence and Soft Computing techniques and their difference from conventional techniques.
2. To generate an ability to design, analyze and perform experiments on real life problems using various Neural Network algorithms.
3. To conceptualize Fuzzy Logic and its implementation for various real-world applications.
4. To provide the understanding of Genetic Algorithms and its applications in developing solutions to real-world problems.
5. To introduce the need and concept of hybrid soft computing algorithms.

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1: Understand AI concepts used to develop solutions that mimic human like thought process on deterministic machines for real-world problems.
- CO2: Analyze and evaluate whether a problem can be solved using AI techniques and analyze the same using basic concepts of AI.
- CO3: Understand the fundamental concepts of Neural Networks, different neural network architectures, algorithms, applications and their limitations.
- CO4: Apply Fuzzy Logic, the concept of fuzziness and fuzzy set theory in various systems.
- CO5: Apply Genetic Algorithms in problems with self-learning situations that seek global optimum.
- CO6: Create solutions to real-world problems using Neural Network, Genetic Algorithms, Fuzzy Logic or their Hybrid systems.



CS-506	DATA MINING & DATA WAREHOUSING	L	T	P	Credit
		3	0	0	3

COURSE OUTCOMES

- CO1: Understand the functionality of the various data mining and data warehousing component
- CO2: Appreciate the strengths and limitations of various data mining and data warehousing models
- CO3: Explain the analyzing techniques of various data
- CO4: Describe different methodologies used in data mining and data ware housing.
- CO5: Compare different approaches of data ware housing and data mining with various technologies.

CS-512	ELECTIVE III (NATURAL LANGUAGE PROCESSING)	L	T	P	Cr
		3	0	0	3

OBJECTIVES

- To explain the leading trends and systems in natural language processing.
- To understand the concepts of morphology, syntax, semantics and pragmatics of the language.
- To recognize the significance of pragmatics for natural language understanding.
- To enable students to describe the application based on natural language processing and to show the points of syntactic, semantic and pragmatic processing.

COURSE OUTCOMES (COS):

After completion of course, students would be able to:

- CO1: Understand fundamentals of Natural Language Processing.
- CO2: Model linguistic phenomena with formal grammars.
- CO3: Design, implement and analyze Natural Language Processing algorithms.
- CO4: Understand approaches to syntax, semantics and discourse generation in natural language processing.
- CO5: Apply NLP techniques to design real world NLP applications, such as machine translation, text categorization, text summarization, information extraction, etc.
- CO6: Implement proper experimental methodology for training and evaluating empirical NLP systems.



CS-552	TRENDS IN AI AND SOFT COMPUTING LAB	L	T	P	Credit
		0	0	4	2

COURSE OUTCOMES

CO1: Implement the AI concepts used to develop solutions that mimic human like thought process on deterministic machines for real-world problems.

CO2: Analyze and evaluate whether a problem can be solved using AI techniques and analyze the same using basic concepts of AI.

CO3: Implement the the fundamental concepts of Neural Networks, different neural network architectures, algorithms, applications and their limitations.

CS-556	DATA MINING & DATA WAREHOUSING LAB	L T P	CR
		0-0-4	2

COURSE OUTCOMES

CO1: Use and Demonstrate the Data Mining Tools : Tanagra, Weka

CO2: Learn the counterparts of the business intelligence like data warehouse, Tanagra, Weka, ERP etc.

CO3: Visualization of the data and dashboards

**Syllabus
of
M.Tech(CS)
2nd Year
3rd Semester**

CS-601	DIGITAL IMAGE PROCESSING	L T P	Cr
		3-0-0	3

OBJECTIVES

This course will equip the students with understanding of digital image processing, segmentation and feature extraction techniques of images, registration and image fusion, and 3D image visualization.

COURSE OUTCOMES

After completion of course, students would be able to:

- CO1:** Explain the essentials of digital image processing.
- CO2:** Describe various segmentation techniques for image analysis.
- CO3:** Outline the various feature extraction techniques for image analysis.
- CO4:** Discuss the concepts of image registration and fusion.
- CO5:** Illustrate 3D image visualization.

CS-603	DATA SCIENCE USING PYTHON	L T P	Cr
		3 0 0	3

OBJECTIVES

It will cover Python programming and its various package such as NUMPY, SCIPY and MATPLOTLIB. This course provides knowledge and expertise to become a proficient data scientist. It helps demonstrate an understand the statistics and machine learning concepts that are vital for data science.



COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1:** Explain how data is collected, managed and stored for data science.
- CO2:** Understand the key concepts in data science, including their real-world applications and the toolkit used by data scientists.
- CO3:** Implement data collection and management scripts using Python Pandas.
- CO4:** Understand how to use the Python standard library to write programs, access the various data science tools, and document and automate analytic processes.
- CO5:** understand the data science processes, data exploration, data visualization, hypothesis building, and testing; and the basics of statistics.
- CO6:** analyze data as well as perform data manipulation using data structures and tools provided in the Pandas package.
- CO7:** Understand an integrated analysis environment for doing data science with Python.
- CO8:** Understand supervised learning and unsupervised learning models such as linear regression, logistic regression, clustering, dimensionality reduction, K-NN, and pipeline.

CS-605	MACHINE LEARNING	L T P	Cr
		3 0 0	3

OBJECTIVES

- To understand and apply both supervised and unsupervised machine learning algorithms to detect and characterize patterns in real-world data.
- To understand complexity of machine learning algorithms, their limitations and open-issues

COURSE OUTCOMES

After completion of course, students would be able to:

- CO1:** Understand the fundamentals of machine learning.
- CO2:** Analyze the performance of machine learning algorithms, and effect of parameters.
- CO3:** Develop an understanding what is involved in learning models from data.
- CO4:** Understand a wide variety of learning algorithms.
- CO5:** Apply principles and algorithms to evaluate models generated from data.
- CO6:** Apply the algorithms to a real-world problem.



CS-607	INTRODUCTION TO BLOCK CHAIN TECHNOLOGY	L T P	Cr
		3 0 0	3

OBJECTIVES

This course explores the fundamentals of blockchain, the workings and applications of this technology and its potential impact on Supply Chain, Manufacturing, Real Estate, Customer Loyalty, Agriculture, Financial Services, Government, Banking, Contracting and Identity Management.

COURSE OUTCOMES

After completion of course, students would be able to:

- CO1: Understand the concept blockchain and its need.
- CO2: Analyze methods of cryptography for application with blockchain.
- CO3: Evaluate the working of blockchain.
- CO4: Understand the underlying technology of transactions, blocks, proof-of-work, and consensus building.
- CO5: Identify real world problems that blockchain can solve and analyze a use case.
- CO6: Develop applications on blockchain using platforms such as Ethereum, Hyperledger or Azure.

CS-609	ELECTIVE IV (COMPUTER VISION)	L T P	Cr
		3-0-0	3

COURSE OUTCOMES

- CO1: Identify basic concepts, terminology, theories, models and methods in the field of computer vision.
- CO2: Describe known principles of human visual system.
- CO3: Describe basic methods of computer vision related to multi-scale representation, edge detection and detection of other primitives, stereo, motion and object recognition.
- CO4: Suggest a design of a computer vision system for a specific problem.

CS-653	DATA SCIENCE USING PYTHON LAB	L T P	Cr
		0 0 4	2

COURSE OUTCOMES

CO1 To Access the .txt file by using Python Libraries.

CO2 Demonstrate the output of data in .txt file.

CO3 Practical Knowledge of Data Analysis, Understanding structured and unstructured data

CO4 Importing and Exporting Data, Basic Insights from Datasets, Cleaning and Preparing the Data

Implementation of Exploratory data analysis, Statistical techniques, Evaluation methods, Machine Learning and Data Science techniques will be done using Python.

CS-659	DISSERTATION PRELIMINARY	L T P	Cr
		0 0 4	2

CS-671	SEMINAR II	L-T-P	CR
		0-0-4	2

OBJECTIVES

The objective of the seminar is to impart training to the students in collecting materials on a specific topic in the broad domain of Engineering/Science from books, journals and other sources, compressing and organizing them in a logical sequence, and presenting the matter effectively both orally and as a technical report.

COURSE OUTCOMES

After undergoing this course, the students will be able to:

CO1: Organize and illustrate technical documentation with scientific rigor and adequate literal standards on the chosen topic strictly abiding by professional ethics while reporting results and stating claims

CO2: Demonstrate communication skills in conveying the technical documentation via oral presentations using modern presentation tools.

CO3: To impart training to students to face audience and present their ideas and thus creating in them self esteem and courage that are essential for engineers.

CO4: To assess the debating capability of the student to present a technical topic.

CO5: To learn real working condition and technologies of Industry.



M.Tech(CS) 2nd

year 4th Semester

CS-602	ELECTIVE V (CRYPTOGRAPHY & CYBER SECURITY)	L	T	P	Credit
		4	0	0	4

OBJECTIVES

- In depth understanding of the Cryptographic Techniques.
- To apply cryptographic techniques in computer systems.
- To learn threats and risks within context of the cyber security architecture.
- Student should learn and Identify security tools and hardening techniques.
- To learn types of incidents including categories, responses and timelines for response.

COURSE OUTCOMES

After completion of course, students would be able to:

- CO1:** Analyse and compare symmetric-key encryption public-key encryption schemes based on different security models.
- CO2:** Apply cyber security architecture principles.
- CO3:** Distinguish system and application security threats and vulnerabilities.
- CO4:** Describe risk management processes and practices.
- CO5:** Identify security tools and hardening techniques.

CS-658	DISSERTATION	L T P	Cr
		0 0 42	21

The Dissertation will be evaluated for 100 marks, with the following weightages:

- Periodic evaluation by Guide (40 marks)
- Internal review (20 marks)
- End Semester viva-voce examination (40 marks)

The end semester viva-voce examination will be conducted by Director's nominee along with an evaluation committee constituted by the Head of the Department. The midterm evaluation will also be done by the evaluation committee. The Departments have to evolve rubrics for evaluation of Dissertation. The marks may be distributed among various components like selection of topic, problem statement, literature review, methodology, oral and written presentation of the work done and performance in viva-voce examination. If the performance of the student in Dissertation (Internal or External) is not satisfactory, he/ she will be awarded 'F' grade. The student has to repeat the dissertation work. Such students may be given an option to either continue with the same topic and with the same guide or change the guide and the topic of his/ her dissertation.



		0-0-4	2
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OBJECTIVES

The objective of this seminar is to impart training to the students based on dissertation and presenting the matter effectively both orally and as a technical report.

COURSE OUTCOMES

After undergoing this course, the students will be able to:

- CO1:** Organize and illustrate technical documentation with scientific rigor and adequate literal standards on the chosen topic strictly abiding by professional ethics while reporting results and stating claims
- CO2:** Demonstrate communication skills in conveying the technical documentation via oral presentations using modern presentation tools.
- CO3:** To impart training to students to face audience and present their ideas and thus creating in them self esteem and courage that are essential for engineers.
- CO4:** To assess the debating capability of the student to present a technical topic.
- CO5:** To learn real working condition and technologies of Industry.

Individual students are required to choose a topic of their interest. A committee consisting of at least three faculty members preferably Expertise in respective fields shall assess the presentation of the seminar and award marks to the students.

Each student shall submit two copies of a write up of his/her seminar topic. One copy shall be returned to the student after duly certifying it by the chairman of the assessing committee and the other will be kept in the departmental library. Internal continuous assessment marks are awarded based on the relevance of the topic, presentation skill, quality of the report and participation.

Department: Department of Computer Applications
Course: Master of Computer Applications (MCA)
Batch:2021-2023

Program Education Objectives (PEOs):

- PEO-I: (Accomplishment)** Possess the well-fortified computing foundation as successful professionals by applying computing fundamentals and domain specific knowledge, demonstrating their innovative skills and considering social and environmental concerns.
- PEO-II: (Competence)** Excel in providing ethical solutions as an individual or a member or a leader of a team by investigating, analysing, formulating and solving complex computing problems in multidisciplinary approaches using modern tools.
- PEO-III: (Expertise)** Exhibit professionalism, ethical attitude in the profession while communicating with local, national and foreign peers, bound within regulations and leading to lifelong learning
- PEO-IV: (Transformation)** Develop awareness for uplifting health, safety, legal, environmental, ethical and cultural diversity issues for serving the society.

Program Outcomes (POs):

- PO-1: Computational Knowledge-** Apply knowledge of computing fundamentals, mathematics and domain specific knowledge for modelling, designing and developing the solution from defined problems and requirements.
- PO-2: Problem Analysis-** Solve complex computing problems and provide authenticated solutions, using conclusion fundamental principles of mathematics, computing, and domain specific disciplines by exploring relevant literatures.
- PO-3: Design / Development of Solutions-** Identify, Analyse, Design and Evaluate a computer-based system, components and process to meet the specific needs of applications, as well as the computing requirements considering public health and safety, cultural, societal, and environmental concerns.



PO-4: Conduct Investigations of Complex Computing Problems- Investigate research techniques for developing effective solutions by systematic analysis of data for getting valid conclusions.

PO-5: Modern Tool Usage- Design, analyse and develop the computing systems using modern tools by considering the limitations.

PO-6: Professional Ethics- Adapt to provide ethical solutions, within the boundaries and responsibilities of professional computing practices and cyber regulations.

PO-7: Life-long Learning- Understand the need, for and have the preparation to absorb in independent and long-term learning in context to technological updates.

PO-8: Project management and finance- Demonstrate knowledge to considerate the computing and management principles and apply them to own establishment, to function effectively as an individual and as a member or leader in diverse teams in multidisciplinary environment.

PO-9: Communication Efficacy- Communicate effectively on computing activities with the computing community, and with society at large and present effectively by writing and designing effective reports and design documentation, make effective presentations, and give and understand clear instructions.

PO-10: Societal and Environmental Concern- Understand the social, professional, cultural, inequality, diversity and ethical issues involved in the development of software systems.

PO-11: Individual and Team Work- Demonstrate as an individual and as a member or as a leader in diverse team and in multidisciplinary environments for effective solutions.

PO-12: Innovation and Entrepreneurship- Demonstrate knowledge by applying innovation skills and initiating significant and prosperous opportunities for the progress of individual and society at large.

Program Specific Outcomes (PSOs):

PSO-1: Globally expertise the technological planning and development of software applications in the usage of the modern era.



- PSO-2:** Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare.
- PSO-3:** Ability to enhance and develop techniques for independent and lifelong learning in computer application.
- PSO-4:** Acquiring In-depth knowledge & sustained learning leading to innovation, permutation, modernization and research to fulfill global interest.

MCA
1st Year
1st Semester

MCA-101	DATA STRUCTURE WITH C	L	T/SDA	P	Credit
		3	0	0	3

OBJECTIVE

To give the students knowledge about the data storage using different data structures and implementation using C programming language

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1:** Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.
- CO2:** Understand basic data structures such as arrays, linked lists, stacks and queues.
- CO3:** Describe the hash function and concepts of collision and its resolution methods
- CO4:** Solve problem involving graphs, trees and heaps
- CO5:** Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data

MCA-105	COMPUTER NETWORKS	L	T/SDA	P	Credit
		3	0	0	3

OBJECTIVE: To have a fundamental understanding of the design, performance and state of the art of wireless communication systems, Topics covered include state of the art wireless standards and research and thus changes substantially form one offering of this course to the next PRE-REQUISITES: Knowledge of computers hardware and software.

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1:** Understand computer network basics, network architecture, TCP/IP and OSI reference models.
- CO2:** Identify and understand various techniques and modes of transmission
- CO3:** Describe data link protocols, multi-channel access protocols and IEEE 802 standards for LAN
- CO4:** Describe routing and congestion in network layer with routing algorithms and classify IPV4 addressing scheme
- CO5:** Discuss the elements and protocols of transport layer. Understand network security and define various protocols such as FTP, HTTP, Telnet, DNS



MCA-107	COMPUTER ORGANIZATION AND ARCHITECTURE	L T P	Cr
		3-0-0	3

OBJECTIVE

To make the students savvy about hardware, their counterparts and frame constructed with these hardware components

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1: Explain the organization of basic computer, its design and the design of control unit.
- CO2: Demonstrate the working of central processing unit and RISC and CISC Architecture.
- CO3: Describe the operations and language of the register transfer, micro-operations and I/O organization.
- CO4: Understand the organization of memory and memory management hardware.
- CO5: Elaborate advanced concepts of computer architecture, Parallel Processing, inter processor communication and synchronization.

MG-121	RESEARCH METHODOLOGY	L	T/SDA	P	Credit
		2	1	0	3

OBJECTIVES

1. To familiarize participants with basic of research and the research process.
2. To enable the participants in conducting research work and formulating research synopsis and report.
3. To familiarize participants with Statistical packages such as SPSS/EXCEL.
4. To impart knowledge for enabling students to develop data analytics skills and meaningful interpretation to the data sets so as to solve the business/Research problem.

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1: Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.
- CO2: Discuss different methodologies and techniques used in research work.
- CO3: Have basic knowledge on qualitative research techniques.
- CO4: Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis
- CO5: Propose the required numerical skills necessary to carry out research.



MG-115	FINANCIAL ACCOUNTING	L	T/SDA	P	Credit
		3	0	0	3

OBJECTIVES: To help the students to develop cognizance of the importance of accounting in organization financial statements and how people analyze the corporate financial under different conditions and understand why people describe the financial statements in different manner. To provide the students to analyze specific characteristics of Logistics Management Accounting and their future action for expenses and income and synthesize related information and evaluate options for most logical and optimal solution such that they would be able to predict and control cost incurrence and improve results

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1:** Demonstrate the applicability of the concept of accounting to understand the managerial Decisions and financial statements
- CO2:** Apply the Financial Statement Analysis associate with Financial Data in the organization.
- CO3:** Analyze the complexities associated with management of cost of product and services in the Organization
- CO4:** Demonstrate how the concepts of accounting and costing could integrate while identification and resolution of problems pertaining to LM Sector
- CO5:** Enable optimal solution such that they would be able to predict and control cost incurrence and improve results.

MCA-151	DATA STRUCTURE WITH C LAB	L	T/SDA	P	Credit
		0	1	2	2

COURSE OUTCOMES

- CO1** Be able to design and analyze the time and space efficiency of the data structure
- CO2** Be capable to identity the appropriate data structure for given problem
- CO3** Have practical knowledge on the applications of data structures



MCA-157	COMPUTER ORGANIZATION & ARCHITECTURE LAB	L	T/SDA	P	Cr
		0	1	2	2

COURSE OUTCOMES

CO1: Implementation of Logic Gates (AND,OR,NOT,NOR,NAND etc) and De’Morgan’s Theorem.

CO2: Implementation of Adders (Half and Full)

CO3: Implementation of Flip Flops.

MCA

1st Year

2nd Semester

MCA-102	WEB DEVELOPMENT	L T P	Cr
		2 0 0	2

COURSE OUTCOMES

CO1: Explain the history of the internet and related internet concepts that are vital in understanding web development.

CO2: Discuss the insights of internet programming and implement complete application over the web.

CO3: Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.

CO4: Utilize the concepts of JavaScript and Java

CO5: Use web application development software tools i.e. Ajax, PHP and XML etc. and identify the environments currently available on the market to design web sites.



MCA-104	DATA BASE MANAGEMENT SYSTEM	L T P	Cr
		3 0 0	3

COURSE OBJECTIVE

To provide knowledge about various organizations and management information systems, keeping in view the aspects of share ability, availability, evolvability and integrity

PRE-REQUISITES

Knowledge of data structures, discrete mathematical structures

COURSE OUTCOMES

- CO1: Define the basic concepts of DBMS and demonstrate the basic elements of a relational database management system
- CO2: Identify the data models for relevant problems and Design entity relationship models.
- CO3: Design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data into RDBMS and formulate SQL queries on the data.
- CO4: Demonstrate their understanding of key notions of query evaluation and optimization techniques and Extend normalization for the development of application software's.
- CO5: Synthesize the concepts of transaction management, concurrency control and recovery.

MCA-106	OPERATING SYSTEMS	L T P	Cr
		3 0 0	3

OBJECTIVE

To provide the knowledge of internals, different types and purpose of operating systems

PRE-REQUISITES

Knowledge of computer organization and architecture programming skills

COURSE OUTCOMES

- CO1: Understand the basics of operating systems like kernel, shell, types and views of operating systems
- CO2: Describe the various CPU scheduling algorithms and remove deadlocks.
- CO3: Explain various memory management techniques and concept of thrashing
- CO4: Use disk management and disk scheduling algorithms for better utilization of external memory.
- CO5: Recognize file system interface, protection and security mechanisms. Explain the various features of distributed OS like Unix, Linux, windows etc



MCA-108	CYBER SECURITY	L T P	Cr
		2 0 0	2

OBJECTIVES

The objective of this course is to create architectural, algorithmic and technological foundations for ensuring cyber security, maintenance of the privacy of individuals, the confidentiality of organizations, and the protection of sensitive information, despite the requirement that information be released publicly or semi-publicly.

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1:** Know about the security issues in case of cyber
- CO2:** Learn about the related concepts of data like privacy attacks, policies etc.
- CO3:** Aware about the architecture and structural organization for a safe cyber system
- CO4:** Know about the practice policies for the real world
- CO5:** Learn about the ways of investigations and handling of evidence in cyber forensic

MCA-110	ANALYSIS & DESIGN OF ALGORITHMS	L T P	Cr
		3 0 0	3

OBJECTIVE:

To relay the theoretical and practical aspects of design of algorithms

PRE-REQUISITES

Knowledge of fundamentals of basic computer programming for implementing algorithms.

COURSE OUTCOMES

- CO1:** Define the basic concepts of algorithms and analyze the performance of algorithms.
- CO2:** Discuss various algorithm design techniques for developing algorithms.
- CO3:** Discuss various searching, sorting and graph traversal algorithms.
- CO4:** Understand NP completeness and identify different NP complete problems.
- CO5:** Discuss various advanced topics on algorithms.

MCA-152	WEB DEVELOPMENT LAB	L T P	Cr
		0 0 2	1

COURSE OUTCOMES

CO1: Implement and Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.

CO2: Utilize the concepts of JavaScript and Java

CO3: Use web application development software tools i.e. Ajax, PHP and XML etc. and identify the environments currently available on the market to design web sites.

MCA-154	DATA BASE MANAGEMENT SYSTEM LAB	L T P	Cr
		0-0-2	1

COURSE OUTCOMES

CO1: Implement the basic concepts of DBMS and Demonstrate the basic elements of a relational database management system

CO2: Identify the data models for relevant problems and Design entity relationship models.

CO3: Design and Implement of entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data into RDBMS and formulate SQL queries on the data.

CO4: Demonstrate their understanding of key notions of query evaluation and optimization techniques and Extend normalization for the development of application software's.



MCA-160	ANALYSIS AND DESIGN OF ALGORITHMS LAB	L	T/SDA	P	Credit
		0	0	2	1

OBJECTIVE

Design, develop, and implement the specified algorithms for the following problems using Java language under LINUX /Windows environment. Netbeans /Eclipse IDE tool can be used for development and demonstration.

COURSE OUTCOMES

- CO1 Be able to design and analyze the time and space efficiency of the data structure
- CO2 Be capable to identify the appropriate data structure for given problem
- CO3 Have practical knowledge on the applications of data structures

PEP-102	UNIVERSAL HUMAN VALUES	L T P	Cr
		1-0-2	2

OBJECTIVE

The present course deals with meaning, purpose, and relevance of universal human values and how to inculcate and practice them consciously to be a good human being and realise one's potentials.

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1: Know about universal human values and understand the importance of values in individual, social circles, career path, and national life.
- CO2: Learn from case studies of lives of great and successful people who followed and practised human values and achieved self-actualisation.
- CO3: Become conscious practitioners of human values.
- CO4: Realise their potential as human beings and conduct themselves properly in the ways of the world.



MCA

2st Year

3rd Semester

MCA-201	COMPUTER GRAPHICS & MULTIMEDIA	L T P	Cr
		3 0 0	3

OBJECTIVE

To impart the knowledge about the different graphics, image, color models as well as its role in real world applications

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1:** Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.
- CO2:** Use of geometric transformations on graphics objects and their application in composite form. Extract scene with different clipping methods and its transformation to graphics display device
- CO3:** Explore projections and visible surface detection techniques for display of 3D scene on 2D screen. Render projected objects to naturalize the scene in 2D view and use of illumination models for this.
- CO4:** Understand the basics of computer graphics, framework for multimedia systems; multimedia devices.
- CO5:** Understand the basics of Multimedia graphics, different graphics systems and applications of computer graphics.

MCA-203	SOFTWARE TESTING	L T P	Cr
		3 0 0	3

Objectives:

Software testing is an activity which aims at evaluating the quality of a software product and also to improve it by identifying defects. Software testing strives to achieve its objectives but has certain limitations. However, adherence to the established objectives ensures effective testing.

COURSE OUTCOMES

After completing this course, the students will be able:

- CO1:** To know about the basic concepts of software testing
- CO2:** To learn about the various techniques of software testing as well as building the test plan
- CO3:** To create different test cases in different situations
- CO4:** To use different tools for building test reports, risks as well as test cases
- CO5:** To automate the testing process



MCA-205	PYTHON PROGRAMMING	L-T-P	Cr
		3-0-0	3

OBJECTIVE

To build programming logic and thereby developing skills in problem solving using Python programming language; To be able to do testing and debugging of code written in Python Emphasize the concepts and constructs rather than on language features.

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1:** Understand the building blocks of Internet of Things and characteristics
- CO2:** Describe the various application areas of IoT.
- CO3:** Design a basic IoT product using Raspberry Pi and sensors.
- CO4:** Deploy an IoT application and connect to the cloud.
- CO5:** Simulate/implement given problem scenario and analyze its performance.

MCA-207	DATA MINING AND DATA WAREHOUSING	L T P	Cr
		3 0 0	3

OBJECTIVE

This course introduces basic concepts, tasks, methods, and techniques in data mining. The emphasis is on various data mining problems and their solutions. Students will develop an understanding of the data mining process and issues, learn various techniques for data mining, and apply the techniques in solving data mining problems using data mining tools and systems. Students will also be exposed to a sample of data mining applications.

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1:** Understand the functionality of the various data mining and data warehousing component
- CO2:** Appreciate the strengths and limitations of various data mining and data warehousing models
- CO3:** Explain the analyzing techniques of various data
- CO4:** Describe different methodologies used in data mining and data ware housing.
- CO5:** Compare different approaches of data ware housing and data mining with various technologies.



MCA-209C	BLOCKCHAIN TECHNOLOGY	L T P	Cr
		3 0 0	3

OBJECTIVE

The primary objective of this course is to provide a broad introduction to blockchain and its application. Blockchain is the distributed and decentralized database technology behind this cyptocurrency. This course explores the fundamentals of the public, transparent, secure, immutable and distributed database called blockchain. Blockchains can be used to record and transfer any digital asset not just currency.

PRE-REQUISITES

Basics of centralized and distributed database and network technologies

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1: Discover blockchain technology
- CO2: Learn and explain why we need blockchain as well working of blockchain
- CO3: Simulations of blockchain without any central controlling agency
- CO4: Design and implementation of new ways of using blockchain for application
- CO5: Explore different platforms such as Ethereum to build applications

MCA-251	COMPUTER GRAPHICS AND MULTIMEDIA LAB	L T P	Cr
		0 0 4	2

COURSE OUTCOMES

The students undergoing this course will be able:

- CO1: To get familiar with different types of media
- CO2: To implement the motion in still images
- CO3: To learn about shape tweening of objects & alphabets
- CO4: To use the macromedia flash
- CO5: To know how to add text in the file



MCA-255	PYTHON PROGRAMMING LAB	L T P	Cr
		0-0-2	1

COURSE OUTCOMES

After completing this course, the students will be able to:

- CO1 Define and demonstrate the use of built-in data structures “lists” and “dictionary”.
- CO2 Design and implement a program to solve a real-world problem
- CO3 Design and implement GUI application and how to handle exceptions and files.
- CO4 Make database connectivity in python programming language.

PDP-201	ADVANCED PROFESSIONAL SKILLS	L-T-P	CR
		1-0-2	2

Pre-requisite/Exposure: Min. B1/B2 level of English Language

Co-requisites: Knowledge of Word processing using MS Word, basic IT skills

Course Outcomes

On completion of this course, the students will be able to:

- CO1: Transition successfully from campus to corporate by gaining an understanding of the corporate environment, the skills desired by employers' and analyzing self-strengths and exploring the possibility of further developing the transferable skills.
- CO2. Experience heightened self-worth and become presentable by acquiring an all-round approach with a combination of skills such as creativity, persuasion, collaboration, adaptability and time management.
- CO3. Understand the importance of written, verbal and non-verbal communication to carry out effective work-related processes in a corporate and team environment.
- CO4. Discern the HR competencies skill map and to be able to introspect and develop a planned approach towards the ever-changing and intensive labor market.

Syllabus
of
MCA
2nd Year 4th
Semester

MCA-202	ARTIFICIAL INTELLIGENCE	L-T-P	Cr
		3-0-0	3

OBJECTIVE

To impart knowledge about the intelligence, artificial intelligence and their role in real world applications

COURSE OUTCOMES

The students undergoing this course will be able to:

- CO1:** Demonstrate fundamental understanding of artificial intelligence (AI) and expert systems. Solve basic AI based problems
- CO2:** Define the concept of Artificial Intelligence and Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- CO3:** Apply AI techniques to real-world problems to develop intelligent systems.
- CO4:** Select appropriately from a range of techniques when implementing intelligent systems.
- CO5:** Discuss the basics of ANN and different optimizations techniques.



MCA-204C	DEEP LEARNING	L T P	Cr
		3 0 0	3

OBJECTIVES

The objective of this course is to cover the fundamental of neural networks as well as some advanced topics such as recurrent neural networks, long short term memory cells and convolutional neural networks. The course also requires students to implement programming assignments related to these topics.

COURSE OUTCOMES

- CO1:** Understand the fundamentals and current usage of the TensorFlow library for deep learning research and the graphical computational model of TensorFlow
- CO2:** Understand the context of neural networks and deep learning
- CO3:** Design recurrent neural networks with attention mechanisms for natural language classification, generation, and translation.
- CO4:** Perform regularization, training optimization, and hyperparameter selection on deep models.
- CO5:** Explore the parameters for neural networks

MCA-272	MAJOR PROJECT	L-T-P	CR
		0-0-10	5

OBJECTIVES

11. Identify and discuss the role and importance of research in the emerging Technology and Engineering
12. Ability to synthesize knowledge and skills previously gained and applied to an in-depth study and execution of new technical problem
13. Capable to select from different methodologies, methods and forms of analysis to produce a suitable research design, and justify their design.
14. Ability to present the findings of their technical solution in a written report.
15. Presenting the work in International/ National conference or reputed journals

COURSE OUTCOMES

After undergoing this course, the students will be able to:

- CO1:** Develop aptitude for research and independent learning.
- CO2:** Demonstrate the ability to carry out literature survey and select unresolved problems in the domain of the selected project topic
- CO3:** Gain the expertise to use new tools and techniques for the design and development.
- CO4:** Acquire the knowledge and awareness to carry out cost-effective and environment friendly designs.
- CO5:** Develop the ability to write good technical report, to make oral presentation of the work, and to publish the work in reputed conferences/journals.



SCHOOL OF COMPUTER SCIENCE & ENGINEERING

Department of Computer Science & Engineering
Bachelor of Technology (B.Tech(CSE))
Batch:2021-2025

Programme Educational Objectives:

PEO 1: To provide core theoretical and practical knowledge in the domain of Computer Science & Engineering for leading successful career in industries, pursuing higher studies or entrepreneurial endeavours.

PEO 2: To develop the ability to critically think, analyze and make decisions for offering techno-commercially feasible and socially acceptable solutions to real life problems in the areas of computing.

PEO 3: To imbibe lifelong learning, professional and ethical attitude for embracing global challenges and make positive impact on environment and society.

Programme Outcomes:

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO 1: Able to identify suitable data structures and algorithms to design, develop and evaluate effective solutions for real-life and research problems.

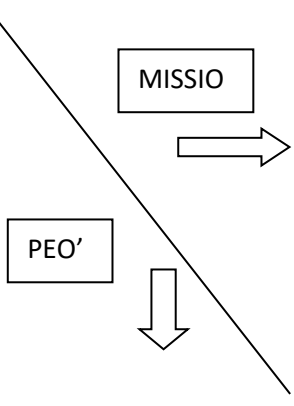
PSO 2: Able to excel in various programming/project competitions and technological challenges laid by professional societies.

School of Engineering & Technology
Department of Electronics & Communication Engineering
Program: B.Tech.
Discipline: Electronics & Communication Engineering (ECE)
Batch: 2021-22

Programme Educational Objectives (PEOs)

- PEO1: To provide students with solid engineering science fundamentals, with a greater focus on Electronics & Communication Engineering through the analysis of electronics & communication challenges.
- PEO2: Provide students with the Electronics & Communication Engineering skills they need to comprehend, interpret, design, and create new products and solutions to real-world problems.
- PEO3: To instill a professional and moral demeanor attitude, effective interpersonal skills, teamwork abilities, a multidisciplinary approach, innovative thinking, and the ability to identify with social issues.
- PEO4: To provide students with a high-quality academic atmosphere in which they can develop leadership skills, written ethical codes and guidelines, and the self-motivated life-long learning habits that are necessary for a successful professional career.
- PEO5: To prepare students for success in Electronics & Communication Engineering field as well as in higher education by instilling strong moral standards and awareness in them.
-

Mapping of PEOs with Mission Statements

	<p>To develop professionals and leaders in Electronics and Communication Engineering who have right attitude and aptitude to serve the society.</p>	<p>To develop and maintain state-of-the-art infrastructure and research facilities to enable, create, apply and disseminate knowledge.</p>	<p>To foster linkages with all stakeholders for continuous improvement in academics.</p>	<p>To develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders can emerge who have deep respect for human life and values.</p>	<p>To undertake disciplinary and inter-disciplinary collaborative projects which offer opportunities for long term interaction with academia and industry.</p>
<p>To provide students with solid engineering science fundamentals, with a greater focus on Electronics & Communication Engineering through the analysis of electronics & communication challenges.</p>	3	3	2	1	2
<p>Provide students with the Electronics & Communication Engineering skills they need to comprehend, interpret, design, and create new products and solutions to real-world problems.</p>	3	3	3	2	2
<p>To instill a professional and moral demeanor attitude, effective interpersonal skills, teamwork abilities, a multidisciplinary approach, innovative thinking, and the ability to identify with</p>	3	2	3	3	3

social issues.					
To provide students with a high-quality academic atmosphere in which they can develop leadership skills, written ethical codes and guidelines, and the self-motivated life-long learning habits that are necessary for a successful professional career.	3	3	2	3	3
<div style="border: 1px solid black; padding: 2px; display: inline-block;"> stu for success in Electronics & Communication Engineering field as well as in higher education by instilling strong moral standards and awareness in them. </div>	3	2	3	3	2

Enter correlation levels 1, 2, or 3 as defined below:

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

If there is no correlation, put “-“

Program Outcomes (PO's)

PO1: **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and Electronics & Communication Engineering specialization to the solution of complex electronics and communication engineering problems.

PO2: **Problem analysis:** Identify, formulate, research literature, and analyze complex Electronics & Communication Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: **Design/development of solutions:** Design solutions for complex Electronics & Communication Engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

- PO4: **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of electronics and communication engineering experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5: **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern electronic engineering and IT tools including prediction and modelling to complex Electronics & Communication Engineering activities with an understanding of the limitations.
- PO6: **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional Electronics & Communication Engineering practice.
- PO7: **Environment and sustainability:** Understand the impact of the professional Electronics & Communication Engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8: **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the Electronics & Communication Engineering practice.
- PO9: **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10: **Communication:** Communicate effectively on complex Electronics & Communication Engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11: **Project management and finance:** Demonstrate knowledge and understanding of the Electronics & Communication Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12: **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of Electronics & Communication Engineering changes.

Program Specific Outcomes (PSO's)

PSO1: An ability to apply the concepts of Robotics & Embedded Systems with its applications.

PSO2: Ability to apply Artificial Intelligence to develop a product.

Mapping of Program Outcome with Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	3	2	2	3	1
PO2	3	3	2	1	3
PO3	2	3	1	3	2
PO4	3	2	3	1	3
PO5	2	1	2	3	2
PO6	1	3	3	2	2
PO7	3	1	2	3	3
PO8	2	3	3	2	1
PO9	3	3	1	2	2
PO10	3	3	2	3	3
PO11	3	2	2	1	2
PO12	3	3	2	3	3
PSO1	2	2	1	3	2
PSO2	3	2	2	1	2

1. Slight (Low)

2. Moderate (Medium)

3. Substantial (High)

B. TECH. (ECE) – SCHEME – 2021-22

DETAILED SYLLABUS

Ist Year

SEMESTER – I

BSC-101	PHYSICS	L-T-P	Credits
		3-1-0	4

Objective: The core objective is to provide a coherent foundation of physics for all majors that are usually necessary to work in areas such as computer science, electronic industry, mechanical domains and communication technologies. The contents are based on the static and dynamic state of elementary physics resulting in the field theory and wave mechanics the matter.

Course Outcomes:

CO1: The students will learn scientific understanding of different phenomena associated with light, relativity, statistical physics, atomic physics, and lasers.

CO2: learn about generation of electromagnetic field.

CO3: Student will the application of laser technology

CO4: Learn the application of wave optics.

CO5: Learn the concepts of quantum mechanics

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

Objective- The objective of this course is to familiarize the prospective engineers with techniques in calculus, multivariate analysis and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

Course Outcome:

- CO1. Learn to apply differential and integral calculus to notions of curvature and to improper integrals. Apart from some other applications they will have a basic understanding of Beta and Gamma functions.
- CO2. Learn the fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems.
- CO3. Learn the tool of power series and Fourier series for learning advanced Engineering Mathematics.
- CO4. Learn to deal with functions of several variables that are essential in most branches of engineering. The essential tool of matrices and linear algebra in a comprehensive manner.
- CO5. Understand the multivariable differential Calculus.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

ESC-101	BASIC ELECTRICAL ENGINEERING	L T P	Cr
		3-1-0	4

OBJECTIVE: To understand and analyze basic electric and magnetic circuits

To study the working principles of electrical machines and power converters.

To introduce the components of low voltage electrical installations.

COURSE OUTCOMES:

CO1: Students are able to understand and analyze basic electric and magnetic circuits

CO2: Students are able to understand the working principles of electrical machines and power converters

CO3: Learn the application of Power convertors.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

OBJECTIVE: To give basic knowledge of Computer Hardware, Software systems & internets

COURSE OUTCOMES:

On successful completion of this course students will be able to:

- Identify different application areas of computers.
- Distinguish hardware and software components of the computer system.
- Use Ms-windows operating system. Make use of the basic Microsoft office applications for office use.
- Identify information resources and services available on the Internet.
- Make use of search and retrieval services on subjects of their interest.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

ESC-153	ENGINEERING GRAPHICS & DESIGN	L-T-P	Credits
		0-0-6	3

Objective: All phases of manufacturing or construction require the conversion of new ideas and design concepts into the basic line language of graphics. Therefore, there are many areas (civil, mechanical, electrical, architectural and industrial) in which the skills of the CAD technicians play major roles in the design and development of new products. The conversion of new ideas and design concepts into the basic line language of graphics. This course is designed to address a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

Course Outcomes:

CO1: To read, understand and apply the knowledge of orthographic projections (production related features and instructions) in manufacturing industry, process industry and other allied engineering application.

CO2: To communicate with the globally recognized engineers and the engineers of different discipline of engineering for research and development activities.

CO3: To apply the concept of intersections of solids for various engineering applications.

CO4: Exposure to engineering graphics standards.

CO5: To understand and apply the concept of surface development for fabricating and manufacturing industrial devices.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

HSS-101	ENGLISH	L T P	Cr
		2-0-0	2

Objective- Recognized different styles of communication and how to improve understanding and build rapport with others. Reflected on different methods of communication and decided when each is most suitable. Appreciated the role of body language and voice tone in effective communication. Communicated their message in an effective and engaging way for the recipient.

Course Outcome:

- CO1: Students will be able to understand and apply knowledge of human communication and language processes.
- CO2: Students will be able to understand and evaluate key theoretical approaches used in the interdisciplinary field of communication.
- CO3: students will be able to explain major theoretical frameworks, constructs, and concepts for the study of communication and language, summarize the work of central thinkers associated with particular approaches, and begin to evaluate the strengths and weaknesses of their approaches.
- CO4: Students will be able to understand the research methods associated with the study of human communication, and apply at least one of those approaches to the analysis and evaluation of human communication.
- CO5: Students will be able to communicate effectively orally and in writing.

POs Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS 13	PSO 14
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

BSC-151	PHYSICS LAB	L-T-P	Credits
		0-0-2	1

Course Objective The present course is aimed to offer a broad aspect of those areas of Physics, which are specifically required as an essential background to all engineering students for their studies in higher semesters.

Course Outcomes:

CO1: The students will have sufficient scientific understanding of different phenomena associated with light, relativity, statistical physics, atomic physics, and lasers.

CO2: Learn about resolving power of Microscope.

CO3: Learn about applications of optical fiber.

CO4: Learn about LCR circuit applications.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

ESC-151	BASIC ELECTRICAL ENGINEERING LAB	L T P	Cr
		0-0-2	1

Objective:

The objective of this course is to build basic concepts of electrical circuits. To understand network theorems and to build fundamental concepts in the design and implementation of different electrical circuit. To build basic concepts for the understanding of different electrical components and devices.

COURSE OUTCOMES:

CO1. The Students will be able to learn Basic concepts of electrical circuits

CO2. The Students will be able to learn Implementation of network theorems.

CO3. Learn Characteristics of different electrical components

CO4. Learn Application of circuit theory in electronics circuit

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

HSS-151	ENGLISH LAB	L T P	Cr
		0-0-2	1

OBJECTIVE: To expose the students to a variety of self-instructional learnerfriendly modes of language learning. To enable them to learn better pronunciation through stress on word accent, Intonation and rhythm and to increase vocabulary

COURSE OUTCOMES:

CO1. Students learn to use the basic concepts of communication in an organised set up and social context

CO2. Learn resume /CV preparation, report writing, format making etc. and to improve writing skills.

CO3. **Learn** body language a presenter

CO4. Learn to create network at meetings, college, or social activities.

CO5. Learn levels of concentration and improves the conversational abilities of the reader.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

MC-101	ENVIRONMENTAL SCIENCE	L T P	Cr
		2 -0 -0	0

Objective- Creating the awareness about environmental problems among people. Imparting basic knowledge about the environment and its allied problems. Developing an attitude of concern for the environment. Motivating public to participate in environment protection and environment improvement.

Course Outcomes:

- CO1. Enable to analyze the national and global environmental issues relating to atmosphere, water, soil and land use, biodiversity, and natural resources (global warming, climate change, mineral extraction and energy resources, environmental impact assessment and environmental audit)
- CO2. Enable to understand environmental politics in contemporary India, and issues in global environmentalism
- CO3. Investigate the agenda of environmental agencies
- CO4. Demonstrates the relationship between types of contaminants and effect on human health.
- CO5. Learn skills to analyze case studies on, industrial pollution and global warming.

CO6. CO7.	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	PO 10	PO 11	PO 12	PS O1	PS O2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

PDP101	AICTE Induction programme + Hobby Club	L T P	Cr
		0-0-2	1

Objective: To make the Environment clean and green and pollution free .The Green club is a part of academic curriculum scheme of Lingaya's Vidyapeeth and taken up by the students of First Year so that they could get the first-hand knowledge of Environment and its sustainability. This club is born with a vision to make the campus green and Eco-friendly and educate the youth about the importance of sustainable development, outside of the campus also.

Course Outcomes:

CO1: Learn the importance of Nature.

CO2: Learn the importance of Natural resources

CO3: Learn to working culture of NGO's

CO4: Learn the leadership qualities.

CO5: Learn to organize the events.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

BSC 102	CHEMISTRY	L T P	Cr
		3-1-0	4

Course Objective: To familiarize the students with basic and applied concept in chemistry

Course Outcomes:

CO1: Recall the fundamentals of basic chemistry

CO2: Familiarise the students with analytical techniques used in identification of molecules

CO3: Recognise and explain the trends in periodic properties

CO4: Understand the spatial arrangement of molecules

CO5: Apply the concept of organic reactions in daily life.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

BSC 104	MATHEMATICS-II	L T P	Cr
		3-1-0	4

Objective: The objective of this course is to familiarize the students with statistical techniques. It aims to equip the students with standard concepts and tools at an intermediate to advanced

Course Outcomes:

CO1: Student will learn the mathematical tools needed in evaluating multiple integrals and their usage.

CO: Develops the ability to solve higher order & first degree linear non homogenous differential equation arising in various branch of engineering and related mathematical model develops arising to form mathematical modeling of Real World Problem with its physical interpretation.

CO3: Students learn about random variables, various discrete, cotinuous probability distributions, and their properties.

CO4: Learn to expand any functions of two variables in the ascending power of variables and also develops error and approximation, extremum value of a given function related to engineering application

CO5: Develop the concepts of Laplace transformation & inverse Laplace Transform with its property to solve partial Differential equation and Ordinary Differential Equation with given boundary conditions which is helpful in all engineering & research work.

Level that will serve them well towards tackling various problems in the discipline.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

ESC-102	PROGRAMMING FOR PROBLEM SOLVING	L T P	Cr
		3-0-0	3

Course Objective: To explore computing and to introduce the art of computer programming. This course teaches the programming,

Course Outcomes:

CO1: Learn C programming

CO2: Able to develop specific application based programs

CO3: Able to set up relation between hardware and software applications

CO4: Knowledge of structured programming in program design

CO5: Learn Program testing skills

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

HSS-102	EFFECTIVE TECHNICAL COMMUNICATION	L T P	Cr
		3-0-0	3

Course Objective: To enable the students to use English language as a tool for their specific professional and individual requirements.

Course Outcomes:

CO1: Students will be able to communicate effectively orally and in writing

CO2: Students will develop knowledge, skills, and judgment around human communication that facilitate their ability to work collaboratively with others

CO3: students will be able to explain major theoretical frameworks, constructs, and concepts for the study of communication and language

CO4: Students will be able to understand and apply knowledge of human communication and language processes as they occur across various contexts, e.g., interpersonal, intrapersonal, small group, organizational, media, gender, family, intercultural communication, technologically mediated communication, etc. from multiple perspectives.

CO5: summarize the work of central thinkers associated with particular approaches, and begin to evaluate the strengths and weaknesses of their approaches

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

ESC-154	WORKSHOP/MANUFACTURING PRACTICE	L T P	Cr
		0-0-4	2

Objective:

- To teach students the practices of workshop management and maintenance.
- To familiarize students with workshop machinery like drills, lathes, welding torches, files, saws, hammers, etc.
- To teach students the need to economize materials when managing a workshop.
- To teach students the safety measures needed in a workshop and how to deal with accidents at work.
- To teach student welding and manufacture of selected items.
- To teach students the practice of plumbing.
- To teach students the basics of electrical installations.

Course Outcomes:

CO1: Enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops.

CO2: Identify the basics of tools and equipment used in fitting, carpentry, sheet metal, machine, welding and smithy

CO3: Learn electrical Installation.

CO4: Learn plumbing and welding

CO5: familiarize with the production of simple models in fitting, carpentry, sheet metal, machine, welding and smithy trades.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

BSC-152	CHEMISTRY LAB	L T P	Cr
		0-0-2	1

Course Objective: To provide an in-depth knowledge of principles of chemical engineering to address the challenges of chemical and industries

Course Outcomes:

CO1: The students will learn to Estimate rate constants of reactions from concentration of reactants/products as a function of time.

CO2: Learn the properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc.

CO3: Learn to Synthesis small drug molecule and analysis a the sample salt

CO4: Learn the filtration techniques used in water purification

CO5: Learn to analysis slats

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

ESC-152	PROGRAMMING FOR PROBLEM SOLVING LAB	L T P	Cr
		0-0-4	2

Course Objective: To learn and develop programs

Course Outcomes:

CO1: Design algorithm, flowchart and pseudopodia

CO2: Develop c programs using control structures

CO3: Develop c programs using functions and arrays

CO4: Demonstrate computer system and program development process

CO5: Develop programs for managing memory using pointers and for processing strings

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

MC-102	CONSTITUTION OF INDIA	L T P	Cr
		2-0-0	0

COURSE OBJECTIVE:

- To acquaint the students with legacies of constitutional development in India and help those to understand the most diversified legal document of India and philosophy behind it.
- To make students aware of the theoretical and functional aspects of the Indian Parliamentary System.
- To channelize students' thinking towards basic understanding of the legal concepts and its implications for engineers.
- To acquaint students with latest intellectual property rights and innovation environment with related regulatory framework.
- To make students learn about role of engineering in business organizations and e-governance.

CO1: Learners should be able to Identify and explore the basic features and modalities about Indian constitution.

CO2: Differentiate and relate the functioning of Indian parliamentary system at the center and state level.

CO3: Differentiate different aspects of Indian Legal System and its related bodies.

CO4: Discover and apply different laws and regulations related to engineering practices.

CO5: Correlate role of engineers with different organizations and governance models

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

SEMESTER – III			
EC-201	ELECTRONICS DEVICES	L T P	CR
		3-1-0	4

Course Objects:

- To give exposure to students about Semiconductor Physics.
- To give the exposure about characteristics of semiconductor devices.
- To introduce the working of different semiconductor electronics devices.
- To introduce about the fabrication technologies of semiconductor electronics devices.

CO1: Understand and utilize the mathematical models of semiconductor junctions and MOS transistors for circuits and systems

CO2: Ability to analyse PN junctions in semiconductor devices under various conditions.

CO3: Ability to design and analyse simple rectifiers and voltage regulators using diodes.

CO4: Ability to design and analyse simple BJT and MOSFET circuits.

CO5: Understand various semiconductor, fabrication process

Course Outcomes: On successful completion of this course, the students should be able to:

- Understand the principles of semiconductor Physics.
- Understand and utilize the mathematical models of semiconductor junctions and MOS transistors for circuits and systems.
- Understand the design & characteristics of semiconductor device.
- Understand various semiconductor, fabrication process.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

EC-203	DIGITAL ELECTRONICS	L T P	CR
		3-0-0	3

Objective:

Modern world deals with digital conditioning of various signals. Digitally manipulating signals or using digital circuits have a lot of advantages in terms of accuracy etc. This subject introduces concept of basic digital electronics: gates; combinational and sequential circuits and their designing.

Course Outcomes: After studying this course the students would gain enough knowledge

- CO1. Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
- CO2. To understand and examine the structure of various number systems and its application in digital design.
- CO3. The ability to understand, analyze and design various combinational and sequential circuits.
- CO4. Ability to identify basic requirements for a design application and propose a cost effective solution.
- CO5. The ability to identify and prevent various hazards and timing problems in a digital design.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

CS-201	Data Structure & Algorithms	L T P	CR
		3-1-0	4

Objective: To relay the theoretical and practical fundamental knowledge of most commonly used algorithms.

Course Outcomes:

- CO1. Ability to analyze algorithms and algorithm correctness.
- CO2. Ability to summarize searching and sorting techniques
- CO3. Ability to describe stack, queue and linked list operation.
- CO4. Ability to have knowledge of tree and graphs concepts.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

BSC-201	Mathematics – III	L T P	CR
		3-1-0	4

Objective: To relay the theoretical and practical fundamental knowledge of most commonly used algorithms.

Course Outcomes:

- CO1. Ability to analyze algorithms and algorithm correctness.
- CO2. Ability to summarize searching and sorting techniques
- CO3. Ability to describe stack, queue and linked list operation.
- CO4. Ability to have knowledge of tree and graphs concepts.

HSS-201	Engineering Economics & Management	L T P	CR
		3 0 0	3

OBJECTIVE The purpose of this course is to

- Acquaint the students in the basic economic concepts and their operational significance
- Stimulate him to think systematically and objectively about contemporary economic problems.

Course Outcomes:

- CO1. Explain the transaction approach and cash balance approach of quantity theory of money
- CO2. Describe the process of credit creation of a commercial bank, describe the balance sheet of a commercial bank, explain the functions of commercial bank
- CO3. Explain the various functions of central bank
- CO4. Describe the various phases of business cycle, explain the Hawtrey's theory of trade cycle
- CO5. Explain the main objective of monetary policy in under developed countries

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

EC-251	Electronics Devices Lab	L T P	CR
		0-0-2	1

LIST OF EXPERIMENTS

1. To study V-I characteristics of diode, and its use as a capacitance.
2. To study the V-I characteristics of Zener Diode.
3. To study the V-I characteristics of LED.
4. Study of the characteristics of transistor in Common Base configuration.
5. Study of the characteristics of transistor in Common Emitter configuration.
6. Study of the characteristics of transistor in Common Collector configuration.
7. Study of V-I characteristics of a photo-voltaic cell.
8. Study of characteristics of JFET in CS configuration.
9. Study of characteristics of MOSFET in CS configuration.
10. Study of photo-resist in metal pattern for planar technology.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

EC-253	Digital Electronics Lab	L T P	CR
		0-0-2	1

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

CS-251	Data Structure Algorithms Lab	L T P	CR
		0 0 2	1

POs Cos	PO 1	P O 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

EC-202C	Analog & Digital Communication	L T P	CR
		3 0 0	3

At the end of this course students will demonstrate the ability to

CO1: Analyze and compare different analog modulation schemes for their efficiency and bandwidth

CO2: Analyze the behaviour of a communication system in presence of noise

CO3: Investigate pulsed modulation system and analyze their system performance

CO4: Analyze different digital modulation schemes and can compute the bit error performance.

CO5: Able to apply concept of random variables in communication.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

EC-204C	Analog Electronics Circuits	L T P	CR
		3 1 0	4

OBJECTIVE: To show the students the physical picture of the internal behavior of semiconductor diode and its different type of circuit. Among these are rectifier; clipper; clamper; and filter also gives knowledge of internal behavior of transistor; FET and its application. This subject deals with the study of circuits designed using Transistors/FETs. It also aims to impart knowledge to the students about Operational Amplifiers and their various linear and non linear applications.

COURSE OUTCOMES:

At the end of this course students will demonstrate the ability to

CO1: Understand the characteristics of diodes and transistors

CO2: Design and analyze various rectifier and amplifier circuits

CO3: Design sinusoidal and non-sinusoidal oscillators

CO4: Understand the functioning of OP-AMP and design OP-AMP based circuits

CO5: Design ADC and DAC

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

EC-206C	Signals and Systems	L T P	CR
		3 1 0	4

Objectives:

To introduce students, the concept and theory of signals and systems needed in electronics and telecommunication engineering fields.

To introduce students to the basic idea of signal and system analysis and its characterization in time and frequency domain

Course Outcomes:

CO1. Understand about various types of signals and systems, classify them, analyze them, and perform various operations on them,

CO2. Understand use of transforms in analysis of signals and system in continuous and discrete time domain.

CO3. Observe the effect of various properties and operations of signals and systems.

CO4. Evaluate the time and frequency response of Continuous and Discrete time systems which are useful to understand the behaviour of electronic

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

EC-208C	Digital System Design	L T P	CR
		3 0 0	3

OBJECTIVE

This course provide student with a foundation in digital system. The course will explore the essential topic related to the design of modern digital circuit and to go about designing complex, high speed digital system and implement such design using programmable logic.

Course outcomes: At the end of this course students will demonstrate the ability to

1. Design and analyze combinational logic circuits
2. Design & analyze modular combinational circuits with MUX/DEMUX, Decoder, Encoder
3. Design & analyze synchronous sequential logic circuits
4. Use HDL & appropriate EDA tools for digital logic design and simulation.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

CS-204C	Computer Architecture & Organization	L T P	CR
		3 0 0	3

OBJECTIVE: To provide basic knowledge of internals of computer, its architecture, components, terminologies, etc. at minute level and ultimately about the working of a digital computer hardware as a whole

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

CS-206C	Data Base Management System	L T P	CR
		3 0 0	3

OBJECTIVE

To provide knowledge about various organizations and management information systems, keeping in view the aspects of share ability, availability, evaluability and integrity

PRE-REQUISITES

Knowledge of data structures, discrete mathematical structures

CO1: Understand database concepts and structures and query language

CO2: Understand the E R model and relational model

CO3: Understand Functional Dependency and Functional Decomposition.

CO4: Understand query processing and techniques involved in query optimization.

CO5: Understand the principles of storage structure and recovery management.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

EC-252C	Analog & Digital Communication Lab	L T P	CR
		0 0 2	1

LIST OF EXPERIMENTS

1. Study of Amplitude Modulation and determination of Modulation index.
2. Study of Frequency Modulation and determination of Modulation index.
3. Study of Phase Modulation.
4. Study of Pulse Amplitude Modulation.
5. Study of Pulse Width Modulation.
6. Study of Pulse Frequency Modulation.
7. Study of Pulse Code Modulation.
8. Study of frequency Shift Keying.
9. Study of ASK and QASK.
10. Study of PSK and QPSK.
11. Project related to the scope of the course.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

EC-254C	Analog Electronics Circuits Lab										L T P		CR	
											0 0 2		1	

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

EC-301C	Microprocessors & Microcontroller	L T P	CR
		3 0 0	3

Objective:

This subject introduces the concept of Microprocessors to the students. It covers 8 bit (8085) and 16-bit (8086) Microprocessors: their architecture, assembly language programming and interfacing with peripheral devices

Course Outcomes:

- CO1. Demonstrate the various features of microprocessor, memory and I/O devices including concepts of system bus.
- CO2. Identify the hardware elements of 8085/8086 microprocessor including architecture and pin functions and programming model including registers, instruction set and addressing modes.
- CO3. Select appropriate 8085/8086 instructions based on size and functions to write a given assembly language program.
- CO4. Design a given interfacing system using concepts of memory and I/O interfacing.
- CO5. Demonstrate the features of advance microprocessors.

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

EC-303C	Network Theory	L T P	CR
		3 1 0	4

Course Outcomes: At the end of this course students will demonstrate the ability to

CO1: Understand basics electrical circuits with nodal and mesh analysis.

CO2: apply electrical network theorems.

CO3: Apply Laplace Transform for steady state and transient analysis.

CO4: Determine different network functions.

CO5: learn the frequency-time domain techniques

POs Cos	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	2	2	2	1	-	-	-	-	-	2	2	1	1
CO2	2	3	1	1	1	-	-	-	-	-	1	2	1	-
CO3	3	2	3	1	-	-	-	-	-	-	2	2	-	-
CO4	1	2	1	2	-	-	-	-	-	-	2	1	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2	-	-

EC-305C	Digital Signal Processing	L T P	CR
		3 0 0	3

Objective To induce a thorough understanding of theory of DSP.

To get in-depth knowledge of various applications- Filters, MultiMate DSP, DSP to speech & Radar, Transforms etc.

Course Outcomes:

- CO1. Able to obtain different Continuous and Discrete time signals.
- CO2. Able to calculate Z-transforms for discrete time signals and system functions.
- CO3. Ability to calculate discrete time domain and frequency domain of signals using discrete Fourier series and Fourier transform.
- CO4. Ability to develop Fast Fourier Transform (FFT) algorithms for faster realization of signals and systems.
- CO5. Able to design Digital IIR/FIR filters from Analog filters using various techniques (Butterworth and Chebyshev).

EC-302	Control System	L T P	Cr
		3 0 0	3

Course Outcomes:

At the end of this course, students will demonstrate the ability to understand the modeling of linear-time-invariant systems using transfer function and state space representations.
Understand the concept of stability and its assessment for linear-time invariant systems.
Design simple feedback controllers.

EC 304	Probability and Stochastic Processes	L T P	Cr
		3 0 0	3

Objective

Learn the concept and application of Random variables

Course Outcomes

- CO1 Define Probability and different Theorems of Probability
- CO2 Explain single, multiple Random Variables, distribution and density functions of Random Variables.
- CO3 Apply the knowledge of Mathematical operations on Random Variables to find the moments.
- CO4 Test the Temporal characteristics of a Random Process.
- CO5 Measure the spectral characteristics of a Random Process

EC 306	Broadband Network	L T P	Cr
		3 0 0	3

Objective:

1. Understanding the architecture, protocols and services that are used in broadband networks, and methods for acquisition of the new future technologies and services to be introduced in the next generation networks
2. Installing and maintaining the equipment needed to operate the broadband networks

Course Outcomes:

- CO1. Define services and specify their applications in modern broadband networks,
- CO2. Explain communication protocols,
- CO3. Analyze and compare the appropriate network architecture,
- CO4. Develop, design and create broadband networks,
- CO5. Choose an engineering approach to solving problems, starting with the acquired theoretical knowledge.

EC-308	Internet of Things (IOT)	L T P	CR
		3 0 0	3

OBJECTIVE:

Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop IOT Devices.

COURSE OUTCOMES:

- CO1. Able to understand the application areas of IOT
- CO2. Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks
- CO3. Able to understand building blocks of Internet of Things and characteristics.
- CO4. Recognize the factors that contributed to the emergence of IoT
- CO5. Use real IoT protocols for communication

EC-310A	Real Time System	L T P	CR
		3 1 0	4

Course Objective:

This course covers the principles of real-time systems, Modeling of a Real-Time System, Task assignment and scheduling, Resource management, Real-time operating systems, RTOS services, Programming language with real-time support, System design techniques, Inter task communication, Fault tolerant techniques, Reliability evaluation methods; Performance analysis, Case studies of real-time systems.

Course Outcomes: On completion of this course, the students will be able to understand concepts of Real-Time systems and modeling recognize the characteristics of a real-time system understand and develop document on an architectural design of a real-time system develop and document Task scheduling, resource management, real-time operating systems

and fault tolerant applications of Real-Time Systems.

EC-310C	Wireless & Cellular System	L T P	CR
		3 1 0	4

Course Outcomes

CO1 Analyze and design wireless and mobile cellular systems.

CO2 Understand impairments due to multipath fading channel.

CO3 Understand the fundamental techniques to overcome the different fading effects.

CO4 Understand Co-channel and Non Co-channel interferences

CO5 Familiar with cell coverage for signal and traffic, diversity techniques and mobile antennas.

CO6 Understanding of frequency management, Channel assignment, and types of handoff.

EC-310D	Fiber Optical Communication	L T P	CR
		3 1 0	4

OBJECTIVE

The aim of this course is to describe the various technologies, implementation, mythologies and performance measurement techniques that make optical fiber communication system possible.

COURSE OUTCOMES

CO1: understand the modulation and demodulation schemes in the coherent optical systems.

CO2: understand the various types of the optical amplifiers

CO3: analyse various multiplexing techniques used and evaluate the recent advances in this field

CO4: compare the merits and demerits, potential applications of microwave semiconductor devices.

CO5: Analyze the operating principle of optical amplifiers

EC-312A	Embedded System Design	L T P	CR
		3 0 0	3

Course Objectives

To introduce the Building 1.Blocks of Embedded System

2. To Educate in Various Embedded Development Strategies

3. To Introduce Bus Communication in processors, Input/output interfacing.

4. To impart knowledge in various processor scheduling algorithms.

5. To introduce Basics of Real time operating system and example tutorials to discuss on one real time operating system tool

Course Outcomes

CO1: Acquire a basic knowledge about programming and system control to perform a specific task.

CO2: Acquire knowledge about devices and buses used in embedded networking

CO3: Develop programming skills in embedded systems for various applications.

CO4: Acquire knowledge about basic concepts of circuit emulators.

CO5: Acquire knowledge about Life cycle of embedded design and its testing

EC-312B	Data Communication	L T P	CR
		3 0 0	3

Course Objective:

- 1.To understand the basic concepts of data communication, layered model, protocols and interworking between computer networks and switching components in telecommunication systems.
2. Discuss the nature, uses and implications of internet technology.
3. To understand the functioning of Frame Relay, ATM.
4. An overview of security issues related to data communication in networks

Course Outcomes

- CO1 Understand the basics of data communication, networking, internet and their importance.
- CO2 Analyze the services and features of various protocol layers in data networks.
- CO3 Differentiate wired and wireless computer networks
- CO4 Analyze TCP/IP and their protocols.
- CO5 Recognize the different internet devices and their functions.

EC-312C	VLSI Design	L T P	CR
		3 0 0	3

OBJECTIVE:

- 1: Learn the design and realization of combinational & sequential digital circuits.
- 2: Architectural choices and performance tradeoffs involved in designing and realizing the circuits in CMOS technology are discussed
- 3: Learn the different FPGA architectures and testability of VLSI circuits.

COURSE OUTCOMES:

- Upon completion of the course, students should be able to
- CO1 Realize the concepts of digital building blocks using MOS transistor.
- CO2 Design combinational MOS circuits and power strategies.
- CO3 Design and construct Sequential Circuits and Timing systems.
- CO4 Design arithmetic building blocks and memory subsystems.
- CO5 Apply and implement FPGA design flow and testing.

EC-352C	Control System Lab	L T P	CR
		0 0 2	1

Course Objectives:

1. Will have a strong knowledge on MATLAB software.
2. To study the concept of time response and frequency response of the system
3. Students get the basic knowledge on practical control system applications on machines & electronic devices.
4. This course aims to familiarize with the modeling of dynamical systems, to simulate and analyze the stability of the system using MATLAB

Course Outcomes:

- CO1. Understand the basics of Matlab and familiarize with control system tool box for designing various LTI systems.
- CO2. Design, analyze various models of the systems in time domain and evaluate different response parameters
- CO3. Analyze stability from root locus of the given model of the system.
- CO4. Prepare professionals in laboratory to compute or to predict the characteristics of a system by visualizing experimental data and its graphical representation.
- CO5. Primarily via team based laboratory activities, students will demonstrate the ability to interact effectively on a social and interpersonal level with fellow students, and will develop the ability to divide up and share task responsibilities to complete assignments.

EC-358	Internet of Things Lab	L T P	Cr
		0 0 2	1

Course Outcomes:

- CO1 Understand the IoT Systems.
- CO2 Understand the concept of M2M (machine to machine) with necessary protocols.
- CO3 Create programs using python scripting language in IoT devices.
- CO4 Create programs for Raspberry Pi interfaces.
- CO5 Understand to communicate with IoT Systems through web-interface.

EC-362A	Embedded System Design Lab	L T P	Cr
		0 0 2	1

Course Objective:

The student should be made to:

- Learn the working of ARM Processor
- Understand the building blocks of Embedded Systems.
- Learn the concept of memory map and memory interface.
- Write programs to interface memory, I/Os with processor
- Study the interrupt performance.

Course Outcome:

At the end of the course, the student should be able to:

- CO1: Write programs in ARM for a specific Application

- CO2: Interface memory, A/D and D/A convertors with ARM system
 CO3: Analyze the performance of interrupt
 CO4: Write program for interfacing keyboard, display, motor and sensor.
 CO5: Formulate a mini project using embedded system

EC-362C	VLSI Design Lab	L T P	Cr
		0 0 2	1

Course Objective

learn Hardware Descriptive Language (Verilog/VHDL). To learn the fundamental principles of VLSI circuit design in digital and analog domain. To familiarize fusing of logical modules on FPGAs. To provide hands on design experience with professional design (EDA) platforms

Course Outcomes

- CO1 Construct NMOS, PMOS, CMOS, and Bi CMOS transistors using various fabrication technologies.
 CO2 Analyze the quality metrics of combinational circuits.
 CO3 Acquire the knowledge in advanced technologies.
 CO4 Design combinational and sequential circuits.
 CO5 Analyze power dissipation and delays in sequential circuits.

EC-364C	Project Work – I	L T P	Cr
		0 0 4	2

Objective:

The student shall be capable of identifying a problem related to the program of study and carry out wholesome research on it leading to findings which will facilitate development of a new/improved product, process for the benefit of the society.

B.Tech projects should be socially relevant and research oriented ones. Student is expected to do an individual project or in group of 3 members. The project work is carried out in two phases – Minor Project in VI semester and Major Project in VII semester. Major project of the project work shall be in continuation of Minor Project only.

EC-401 C	Smart Grid Technology	L T P	Cr
		3 0 0	3

Course Objectives:

- To introduce students about the challenging issues and architecture of smart grid
- To give exposure to the students about the communication and wide area monitoring in smart grid
- To introduce the implementation of the control in computational intelligence and security issues in smart grid and the role of Power electronics and energy storage in smart grid

Course Outcomes: At the end of this course, students will demonstrate the ability to

1. Understand the challenging issues and architecture of smart grid
2. Understand the communication and wide area monitoring in smart grid
3. Rudimentary energy management issues in smart grid
4. Acquire the knowledge in computational intelligence and security issues in smart grid
5. Know the role of Power electronics and energy storage in smart grid

EC-403C	Electronics System Design	L T P	CR
		3 0 0	3

Course Objectives:

The course treats different aspects of printed circuit boards in electronic system design with the aim that the student should learn to design, simulate and assemble an electronic system and analyze the influence of interconnects at different levels on the performance of electronic systems

Course Outcomes

At the end of the course, the student should be able to:

CO1 explain and apply basic principles and guidelines for physical architectural design for complex electronic systems from the level printed circuit boards (PCB) to higher levels

CO2 design PCBs considering signal integrity and impedance matching

CO3 analyse and budget system noise

CO4 design power distribution and analyse noise related to power supply

CO5 design impedance matching networks for electronic systems for radio frequency

EC-417C	Energy Harvesting Technologies & Power Management for IOT devices	L T P	CR
		3 0 0	3

Course Objectives:

1 Understanding the various energy sources and Energy harvesting based sensor network

2 Learn about the various piezoelectric materials and non linear techniques

3 Learn various power sources of WSN

4 Learn about the application of WSN

Course Outcomes:

At the end of the course, the student should be able to:

CO1 Understand the techniques used in Energy Harvesting

CO2 Undersatnd various power sources of WSN

CO3 Understand the application of piezo materials

CO4 Understand the application of Bio MEMS

CO5 Develop system model for Energy harvesting

EC-423C	IoT Using RFID and Microcontroller	L T P	CR
		3 0 0	3

Course objective

1. To learn the basics of RFID and 8051 microcontrollers
2. Interfacing RFID with microcontrollers
3. To develop real time applications based on microcontrollers
4. Analyze different case studies.

COURSE OUTCOMES

- CO1.Explain the orbits of satellites, satellite mechanism, satellite hardware and Earth station design.
- CO2. Describe the concepts of signal propagation effects, frequency and noise considerations, which affect satellite link design.
- CO3. Investigate various multiple access techniques used for satellite communication.
- CO4. Describe the fundamentals underlying the operation of VSAT systems and MSAT
- CO5.Learn the satellite link design

EC-425C	Satellite communication	L T P	CR
		0 0 2	1

OBJECTIVE

The course aims to provide a comprehensive understanding of satellite communication to perform and verify link budget equations. It also discusses the modulation and multiplexing techniques for satellite, link and application areas of the satellite.

COURSE OUTCOMES

- CO1.Explain the orbits of satellites, satellite mechanism, satellite hardware and Earth station design.
- CO2. Describe the concepts of signal propagation effects, frequency and noise considerations, which affect satellite link design.
- CO3. Investigate various multiple access techniques used for satellite communication.
- CO4. Describe the fundamentals underlying the operation of VSAT systems and MSAT
- CO5.Learn the satellite link design

EC-453C	Electronics System Design Lab	L T P	CR
		0 0 2	1

Objectives:

To understand the design procedure of different power supplies.
 To know to design trans receiver and voltage regulator.
 To understand the working of Microprocessor and DSP based system design

Course Outcomes:

At the end of the course, the student should be able to:
 CO1 Design different forms of power supply.
 CO2 Design Voltage regulators
 CO3 AM/FM trans receiver.
 CO4 Know the design procedure of Instrumentation amplifier and Digital Indicator.
 CO5 Understand the working of modems and timers.

EC-473C	IoT Using RFID and Microcontroller Lab	L T P	CR
		0 0 2	1

Course Objectives:

1 To learn programming of Arduino board
 2 To learn website designing and publishing
 3 To design Home automation system

Course Outcomes

At the end of the course, the student should be able to:
 CO1 Program the Arduino Board
 CO2 host website
 CO3 deal with gas Sensor
 CO4 learn Interfacing of LCD display with Arduino
 CO5 design home automation projects

EC-475C	Satellite Communication Lab	L T P	CR
		0 0 2	1

Course Objectives:

1. This course will introduce the basic concepts and techniques of Satellite communication and frequency allocations.
 2. The course emphasizes intuitive understanding and practical implementations of the theoretical concepts.
 3. To produce graduates who understand how to analyze and manipulate digital signals and to determine the orbital issues to have the fundamental knowledge to do so, for navigation and GPS

Course Outcomes

At the end of the course, the student should be able to:

CO1 Able to obtain different types of satellites

CO2 Ability to calculate the orbital determination and launching methods

CO3 Ability to develop commands, monitoring power systems and developments of antennas.

CO4 Able to calculate multiple access techniques like TDMA, CDMA, FDMA,DAMA.

CO5 Able to design antennas to provide Uplink and Down link Frequency.

EC-406D	Big Data Analysis	L T P	CR
		3 0 0	3

COURSE OBJECTIVES :

Understand the Big Data Platform and its Use cases Provide an overview of Apache Hadoop

- Provide HDFS Concepts and Interfacing with HDFS
- Understand Map Reduce Jobs • Provide hands on Hadoop Eco System
- Apply analytics on Structured, Unstructured Data.
- Exposure to Data Analytics with R.

COURSE OUTCOMES:

The students will be able to:

- Identify Big Data and its Business Implications.
- List the components of Hadoop and Hadoop Eco-System
- Access and Process Data on Distributed File System
- Manage Job Execution in Hadoop Environment
- Develop Big Data Solutions using Hadoop Eco System
- Analyze Infosphere BigInsights Big Data Recommendations.
- Apply Machine Learning Techniques using R.

Pre-requisites : Should have knowledge of one Programming Language (Java preferably), Practice of SQL (queries and sub queries), exposure to Linux Environment

EC-408D	INDUSTRY 4.0 and INDUSTRIAL INTERNET OF THINGS	L T P	CR
		3 0 0	3

Course Outcomes

At the end of the course, the student should be able to:

CO1 Able to obtain different types of satellites

CO2 Ability to calculate the orbital determination and launching methods

CO3 Ability to develop commands, monitoring power systems and developments of antennas.

CO4 Able to calculate multiple access techniques like TDMA, CDMA, FDMA,DAMA.

CO5 Able to design antennas to provide Uplink and Down link Frequency

COURSE OUTCOMES:

The students will be able to:

- Identify Big Data and its Business Implications.
- List the components of Hadoop and Hadoop Eco-System
- Access and Process Data on Distributed File System
- Manage Job Execution in Hadoop Environment
- Develop Big Data Solutions using Hadoop Eco System
- Analyze Infosphere BigInsights Big Data Recommendations.
- Apply Machine Learning Techniques using R.

Pre- requisites : Should have knowledge of one Programming Language (Java preferably), Practice of SQL (queries and sub queries), exposure to Linux Environment

EC-483C	Major Research Project	L T P	Cr
		0-0-32	16

Course Objective:-

- To enhance employ ability skills and become job ready along with real corporate exposure.
- To enhance students' knowledge in core study.
- To Increase self-confidence of students and helps in finding their own proficiency
- To cultivate student's leadership ability and responsibility to perform or execute the given task.
- To provide knowledge of a real job situation.

Course Outcomes:-

CO1.Capability to acquire and apply fundamental principles of engineering.

CO2.Become updated with all the latest changes in technological world

CO3.To be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills

CO4.Ability to identify, formulate and model problems and find engineering solution based on a systems approach

CO5.Awareness of the social, cultural, global and environmental responsibility as an engineer.

CO6.Capability and enthusiasm for self-improvement through continuous professional development and life-long learning

CO7. EC-484C	Seminar	L T P	Cr
		0-0-2	1

Course Outcomes:-

CO1. Learn to demonstrate awareness of the ethics involved in doing an internship

CO2 Learn to describe, analyze, and synthesize their learning experience in the internship in the form of presentation

CO3 Articulate new learning from the internship experience in the form of an oral presentation.

CO4 Learn to present understanding and assess the challenges carrying out an internship CO5
Learn to demonstrate meaningful and practical experience in their 6month duration of real
industrial training

School of Engineering & Technology
Department of Electronics & Communication Engineering
Program: M.Tech.
Discipline: Electronics & Communication Engineering (ECE)
Batch: 2021-22

Programme Educational Objectives (PEOs)

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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Scheme and Syllabus

SN	Category	Course Code	Course Name	Periods			Credit	Evaluation Scheme					Subject Total
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
2	PCC	EC-509	Detection and Estimation Theory	3	0	0	3	15	25	60	-	-	100

Course Objectives: The goal of the course is to teach students the basics of estimation and detection theory. More specifically, it is to introduce the students to classical and Bayesian estimators, estimation bounds, hypothesis testing, and a number of detectors of signals in noise. Exposing the students to applications of estimation and detection is another important goal.

Course Outcomes At the end of the course, the student should be able:

- CO1 To analyze the general principles of detection and estimation theory
- CO2 To Apply detection and estimation theory to the communication problems
- CO3 To comprehend the advanced level knowledge in communication theory.
- CO4 learn probability concepts used in wireless communication
- CO5 learn techniques of Signal estimation

Unit-1 Review of Gaussian variables and processes

Background: Review of Gaussian variables and processes; problem formulation and objective of signal detection and signal parameter estimation in discrete-time domain. Statistical Decision Theory: Bayesian, minimax, and Neyman-Pearson decision rules, likelihood ratio, receiver operating characteristics, composite hypothesis testing, locally optimum tests, detector comparison techniques, asymptotic relative efficiency.

Unit-2 Detection of Deterministic Signals

Matched filter detector and its performance; generalized matched filter; detection of sinusoid with unknown amplitude, phase, frequency and arrival time, linear model. Detection of Random Signals: Estimator-correlator, linear model, general Gaussian detection, detection of Gaussian random signal with unknown parameters, weak signal detection

Unit-3 Nonparametric Detection

Detection in the absence of complete statistical description of observations, sign detector, Wilcoxon detector, detectors based on quantized observations, robustness of detectors.

Unit-4 Estimation of Signal Parameters

Minimum variance unbiased estimation, Fisher information matrix, Cramer-Rao bound, sufficient statistics, minimum variance unbiased estimation, complete statistics; linear models; best linear unbiased estimation; maximum likelihood estimation, invariance principle; estimation efficiency; Bayesian estimation: philosophy, nuisance parameters, risk functions, minimum mean square error estimation, maximum a posteriori estimation.

Unit 5 Signal Estimation in Discrete

Signal Estimation in Discrete-Time: Linear Bayesian estimation, Wiener filtering, dynamical signal model, discrete Kalman filtering.

Text Books:

1. H. L. Van Trees, "Detection, Estimation and Modulation Theory: Part I, II, and III", John Wiley, NY, 1968.

Reference Books:

1. H. V. Poor, "An Introduction to Signal Detection and Estimation", Springer, 2/e, 1998.
2. S. M. Kay, "Fundamentals of Statistical Signal Processing: Estimation Theory", Prentice Hall PTR, 1993.

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	-	-	-	-	-	2	2
CO2	2	3	1	1	1	-	-	-	-	-	1	2
CO3	3	2	3	1	-	-	-	-	-	-	2	2
CO4	1	2	1	2	-	-	-	-	-	-	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2

SN	Category	Course Code	Course Name	Periods			Credit	Evaluation Scheme					Subject Total
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
3	PCC	EC-511	Neural Networks And Fuzzy Logic	3	0	0	3	15	25	60	-	-	100

Course Objectives: This course introduces the basics of Neural Networks and essentials of Artificial Neural Networks with Single Layer and Multilayer Feed Forward Networks. It deals with Associate Memories and introduces Fuzzy sets and Fuzzy Logic system components. The Neural Network and Fuzzy Network system application to Electrical Engineering is also presented. This subject is very important and useful for doing Project Work. The main objective of this course is to provide the student with the basic understanding of neural networks and fuzzy logic fundamentals.

Course Outcomes At the end of the course, the student should be able to:

- CO1 Comprehend the concepts of feed forward neural networks
- CO2 Analyze the various feedback networks.
- CO3 Understand the concept of fuzziness involved in various systems and fuzzy set theory.
- CO4 Comprehend the fuzzy logic control and adaptive fuzzy logic and to design the fuzzy control using genetic algorithm.
- CO5 Analyze the application of fuzzy logic control to real time system

Unit-1 Introduction

Neural networks characteristics, History of development In neural networks principles, Artificial neural net terminology, Model of a neuron, Topology.

Unit-2 Learning Methods & Neural network models

Learning Methods & Neural network models: types of learning, Supervised, Unsupervised, Reinforcement learning. Knowledge, representation and acquisition. Basic Hop field model, Basic learning laws, Unsupervised learning, Competitive learning, Kmeans clustering algorithm, Kohonen's feature maps.

Unit-3 Artificial Neural Networks

Radial basis function neural networks, Basic learning laws in REF nets, Recurrent back propagation. Introduction to counter propagation networks, CMAC network, and ART networks.

Unit-4 Applications of neural nets

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Scheme and Syllabus

Applications of neural nets: Applications such as pattern recognition, Pattern mapping, Associative memories, speech and decision-making.

Unit 5 Fuzzy Logic

Basic concepts of fuzzy logic, Fuzzy vs. Crisp set, linguistic variables, Membership functions Fuzzy sets & Operations of fuzzy sets Fuzzy IF-THEN rules, Variable inference techniques, DeFuzzification, Basic fuzzy inference algorithm, Fuzzy system design, Antilock Breaking system (ABS), Industrial applications.

Text Books:

1. J.M. Zurada, "Introduction to artificial neural systems", Jaico Pub.
2. ROSS J.T., "Fuzzy logic with engineering application", TMH

Reference Books:

1. Simon Haykin, "Neural Networks", PHI
2. Ahmad M. Ibrahim, "Introduction to applied Fuzzy Electronics", (PHI) 3. P.D. Wasserman, "Neural computing theory & practice", (ANZA PUB).

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	-	-	-	-	-	2	2
CO2	2	3	1	1	1	-	-	-	-	-	1	2
CO3	3	2	3	1	-	-	-	-	-	-	2	2
CO4	1	2	1	2	-	-	-	-	-	-	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2

SN	Category	Course Code	Course Name	Periods			Credit	Evaluation Scheme					Subject Total
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
4	PCC	EC-513	Underwater Communication	3	1	0	4	15	25	60	-	-	100

Course Objectives: This course provides an outline about sonar systems, its types and their applications. The course will provide overview of signal processing and filtering options for output received from sonar systems and acoustic modems. It will discuss acoustic modems and underwater sensor networks. The aim of this course is to discuss the transducers and array systems used for sonar, classification of sonar systems and modern versions, Signal processing, filtering and noise impact on sonar systems.

Course Outcomes At the end of the course, the student should be able to:

- CO1 Acquire in-depth knowledge and analyze on Sound Navigation and Ranging (SONAR) equations and its characteristics
- CO2 Gain knowledge and apply OFDM concepts for underwater applications.
- CO3 Acquire knowledge on working of underwater Acoustic transducers
- CO4 Analyze Ocean Acoustic Processing and sound wave propagation.
- CO5 Acquire knowledge and analyze Underwater reverberation and various types of noises

Unit-1 Introduction

Basics of underwater communication, acoustic waves as carrier, challenges in acoustic communication, sound propagation mechanism.

Unit-2 Applications of Digital Signal Processing to Sonar

Characteristics of Sonar Signal propagation, Digital signal Processing for active sonar system and digital signal processing for passive sonar systems, Signal Processing Hardware - TMS 320 Series Signal Processors, real-time implementation considerations.

Unit-3 Orthogonal Frequency division multiplexing

Key features, characteristics and principle of operation of OFDM, Channel coding and interleaving System model, Enhancement of spectral efficiencies, Transmission/ Reception of OFDM Simulations.

Unit-4 Acoustic Modem

Underwater Wireless Modem-Sweep spread carrier signal-transmission characteristics in shallow water channel-separation of time varying multipath arrivals-Typical acoustics modems-characteristics and specifications-Applications, Acoustic Releases-Real time wireless current monitoring system.

Unit 5 Underwater Sensor Network

Underwater Networking-Ocean Sampling Networks, Pollution Monitoring, Environmental Monitoring and Tactical surveillance systems, Major challenges in design of Underwater Sensor Networks, Factors that affect the UWSN-Sensor Node Architecture-GIBS, VRAP, DABSRAPT, etc.

Text Books:

1. Underwater Communications, Marco Lanzagorta, Morgan & Claypool Publishers, 2012

Reference Books:

1. Principles of Underwater Sound' Robert J. Urick, McGraw Hill Book Company, New York (1975)
2. Digital Underwater Acoustic Communications - 1st Edition Lufen Xu Tianzeng Xu - Elsevier
3. Richard A. Haddad and Thomas W Parsons, "Digital Signal Processing: Theory Applications and Hardware", Computer Science Press, 1991.
4. SONAR for Practicing Engineers, A.D. Waite John, Wiley & Sons, Ltd., (1998).

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	-	-	-	-	-	2	2
CO2	2	3	1	1	1	-	-	-	-	-	2	2
CO3	3	2	3	1	-	-	-	-	-	-	2	1
CO4	1	2	1	2	-	-	-	-	-	-	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2

SN	Category	Course Code	Course Name	Periods			Credit	Evaluation Scheme					Subject Total
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
5	PCC	EC-561	Neural Networks And Fuzzy Logic Lab	0	0	2	1	0	0	0	60	40	100

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Scheme and Syllabus

Course Objective

1. Acquaint student with various computing algorithms in FLNN using software tools.
2. Understand operation of basic elements in fuzzy logic and neural network through simulation.
3. Learn development of algorithms to solve real life applications.

Course Outcomes

- CO1 Demonstrate basic concepts fuzzy logic and neural network through simulation.
- CO2 Develop the logic given in problem statement using algorithms in NN and basics of toolbox studied.
- CO3 Develop the logic given in problem statement using operations in fuzzy logic and basics of toolbox studied.
- CO4 Develop real life applications using NN and Fuzzy Logic
- CO5 Learn a fuzzy controller systems using fuzzy tool of Matlab

S.N List of Experiments

- 1 Implementation of Fuzzy Operations.
- 2 Implementation of Fuzzy Relations (Max-min Composition)
- 3 Implementation of Fuzzy Controller (Washing Machine)
- 4 Implementation of Simple Neural Network (McCulloch-Pitts model)
- 5 Implementation of Perceptron Learning Algorithm
- 6 Implementation of Unsupervised Learning Algorithm
- 7 Implementation of Simple Genetic Application
- 8 Study of ANFIS Architecture
- 9 Study of Derivative-free Optimization
- 10 Study of research paper on Soft Computing

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	-	-	-	-	-	2	2
CO2	2	3	1	1	1	-	-	-	-	-	1	2
CO3	3	2	3	1	-	-	-	-	-	-	2	2
CO4	1	2	1	2	-	-	-	-	-	-	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2

SN	Category	Course Code	Course Name	Periods			Credit	Evaluation Scheme					Subject Total
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
6	PCC	EC-563	Project	0	0	4	2	0	0	0	-	100	100

Course Objectives: The student shall be capable of identifying a problem related to the program of study and carry out wholesome research on it leading to findings which will facilitate development of a new/improved product, process for the benefit of the society.

Course Outcomes At the end of the course, the student should be able to:

- CO1 Identify problems that have relevance to societal / industrial needs
- CO2 Exhibit independent thinking and analysis skills
- CO3 Demonstrate the application of relevant science / engineering principles
- CO4 Gain the expertise to use new tools and techniques for the design and development.
- CO5 Develop the ability to write good technical report, to make oral presentation of the work, and to publish the work in reputed conferences/journals.

S.No Modalities / Requirements

- 1 Individual or group projects can be taken up
- 2 Involve in literature survey in the chosen field
- 3 Use Science/Engineering principles to solve identified issues
- 4 Adopt relevant and well-defined / innovative methodologies to fulfill the specified objective
- 5 Submission of scientific report in a specified format (after plagiarism check)

Student Assessment : Periodical reviews, oral/poster presentation

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	-	-	-	-	-	2	2
CO2	2	3	1	1	1	-	-	-	-	-	1	2
CO3	3	2	3	1	-	-	-	-	-	-	2	2
CO4	1	2	1	2	-	-	-	-	-	-	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2

SN	Category	Course Code	Course Name	Periods			Credit	Evaluation Scheme					Subject Total
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
7	PCC	EC-565	Seminar-I	3	1	0	2				-	-	100

Course Objectives: The objective of the seminar is to impart training to the students in collecting materials on a specific topic in the broad domain of Engineering/Science from books, journals and other sources, compressing and organizing them in a logical sequence, and presenting the matter effectively both orally and as a technical report. The topic should not be a replica of what is contained in the syllabi of various courses of the M. Tech program.

Course Outcomes At the end of the course, the student should be able to:

- CO1 collect useful information from the literature on the assigned topic

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- Organize and illustrate technical documentation with scientific rigor and adequate literal standards on the chosen topic strictly abiding by professional ethics while reporting results and stating claims
- Develop the ability to write good technical report, to make oral presentation of the work
- Develop aptitude for research and independent learning
- Develop the ability to publish the work in reputed conferences/journals.

S.No Modalities / Requirements

- One faculty assigned to each M. Tech student. Usually the assigned faculty suggest a particular research topic to the concern student. Subsequently student collects research papers.
- The faculty assigned/ supervisor gives one / two research paper and advice the student to make detail study on
- Authors contribution
 - Mathematical analysis
 - Performance comparison parameters
- The student has to undertake extensive literature survey on a topic with the approval of the course coordinator. The course coordinator shall not be below the rank of Assistant Professor. The work may involve extensive search of print, audio-video materials, internet surfing etc.
- The work of monitoring will be done by the course coordinator and evaluation by the course coordinator and the HOD or his nominee.

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Cos												
CO1	3	2	2	2	1	-	-	-	-	-	2	2
CO2	2	3	1	1	1	-	-	-	-	-	1	2
CO3	3	2	3	1	-	-	-	-	-	-	2	2
CO4	1	2	1	2	-	-	-	-	-	-	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2

SN	Category	Course Code	Course Name	Periods			Credit	Evaluation Scheme					Subject Total
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
8	PCC	EC-567	Dissertation Phase-1	3	1	0	4	15	25	60	-	-	100

Course Objectives:

- To analyze the title and proposed a model for Dissertation.
- To gear up students for preparation of Dissertation-Phase 2 in Semester-IV

Course Outcomes At the end of the course, the student should be able to:

- CO1 To study of literature survey, formulate the research problem and develop necessary methodology
- CO2 A workable design/ algorithm to be developed based on the proposed methodology,
- CO3 demonstrate independence and originality in thought and application.
- CO4 Demonstrate communication skills in conveying the technical documentation via oral presentations using modern presentation tools.
- CO5 Learn Simulation tool to execute the research work

Title of the Dissertation- This should be carefully decided by the student after discussing with the dissertation supervisor or the guide.

Students will select topics from the field of recent trends and based on a thorough review of literature on that topic, they will identify the problems and decide on plans of research for dissertation. Under the supervision of faculty members, they will execute their plans involving theoretical and/or experimental work. Students will have to prepare proper documentation consisting of SRS, Modeling Techniques, Development Strategies and Implementation and Testing Strategies. This is done during phase 1. Regular reviews will be conducted.

Student has to spend two hours daily in library to analyze the problem.

It is also essential for student to meet supervisor twice in a week to discuss the research problem.

After four weeks of registration the first evaluation has been done before committee to revive the literature survey and formulation of the problem. In second the At end of semester, simulation based design has been analyzed by the committee.

S.No Evaluation Scheme for Dissertation Part-I

- Day to day work 35% awarded by the Supervisor(s)
- One Mid-Term Seminar 15% awarded by a panel of examiners students on the project work
- One Viva-Voce Examination Between Test T-2 and Test T-3 15% awarded by a panel of examiners
- Dissertation Report 15% awarded by the supervisor (s)
- Final Viva-Voce/ 20% awarded by a panel of three Defense/ Dissertation teachers including Supervisors. In case of M.Tech. Programs, External examiner being a part of the panel

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Cos												
CO1	3	2	2	2	1	-	-	-	-	-	2	2
CO2	2	3	1	1	1	-	-	-	-	-	2	2
CO3	3	2	3	1	-	-	-	-	-	-	2	1
CO4	1	2	1	2	-	-	-	-	-	-	1	2
CO5	2	3	3	3	-	-	-	-	-	-	1	2

SN	Category	Course Code	Course Name	Periods			Credit	Evaluation Scheme					Subject Total
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
1	PCC	EC-508	Radar System Analysis and Design	3	1	0	4	15	25	60	-	-	100

Course Objectives:

- describe radars and explain how they are used to detect remote objects

Lingaya's Vijayapeetham, Pattinam
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- 2 analyze radar systems to assess performance
- 3 explain the processing of radar signals
- 4 describe the effects of the atmosphere and interference on radar systems
- 5 design a radar system for a particular application and technical specification

Course Outcomes At the end of the course, the student should be able to:

- CO1 Demonstrate an understanding of the factors affecting the radar performance using Radar Range Equation.
- CO2 Analyze the principle of FM-CW radar and apply it in FM- CW Altimeter.
- CO3 Differentiate between a MTI Radar and a Pulse Doppler Radar based on their working principle.
- CO4 Demonstrate an understanding of the importance of Matched Filter Receivers in Radars.
- CO5 Familiarize with the different types of Radar Displays and their application in real time scenario

Unit-1 Radar Range Equation

Radar fundamentals, Derivation of range equation, the search radar equation, Jamming and radar range with jamming, Radar clutter and radar range with clutter, Radar range with combined interferences sources.

Unit-2 Theory of Target Detection

Noise and false alarms, Detection of one sample of signal with noise, Integration of pulse trains, Detection of fluctuating targets, CFAR, Optimum and matched filter Theory, Loss factors in detection.

Unit-3 Targets and Interference

Definition of radar cross section, Radar cross section of simple and complex objects, Spatial distribution of cross section, Bistatic cross section, CW and FM Radar: Doppler Effect, CW and FMCW Radar, Airborne Doppler Navigation, Multi frequency CW Radar.

Unit-4 MTI Radar

Delay lines and line cancellors, Subclutter Visibility. MTI using range gates and filters, Pulse Doppler radar, Non-coherent MTI radar, Application of Digital signal processing to radar system. Tracking Radar: Different types of tracking techniques, Tracking in range, Tracking in Doppler, Search Acquisition radar, Comparison of Trackers.

Unit 5 Introduction to Pulse Compression Radar

Height finding radars, Air traffic control Radars and data handling, Atmospheric effects of radar, Electromagnetic compatibility aspects, Airborne Radars, Synthetic Aperture Radar, Secondary surveillance Radars.

Text Books:

1. David Barton .K, "Modern Radar System Analysis", Artech House, 1988.

Reference Books:

1. Fred Nathanson E, "Radar Design Principles Signal Processing and The Environment", McGraw Hill, 1969.*
2. Cook CE, Bernfield. M, "Radar Signals", Academic Press, 1967.
3. Skolnik, "Introduction to radar systems", McGraw Hill, 2nd Edition, 2003.

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	-	-	-	-	-	2	2
CO2	2	3	1	1	1	-	-	-	-	-	1	2
CO3	3	2	3	1	-	-	-	-	-	-	2	2
CO4	1	2	1	2	-	-	-	-	-	-	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2

SN	Category	Course Code	Course Name	Periods			Credit	Evaluation Scheme					Subject Total
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
2	PCC	EC-510	Architectural Design of Digital Integrated Circuits	3	1	0	4	15	25	60	-	-	100

Course Objectives: This course covers algorithm, architecture and circuit design trade-offs to optimize for power, performance and area.

- 1 Analyze the manufacturability of Integrated Circuits with various design constrains.
- 2 Identify the fundamentals of IC fabrication
- 3 Build an idea on process integration – NMOS, CMOS and Bipolar process

Course Outcomes At the end of the course, the student should be able to:

- CO1 Calculate various parameters and short channel effects of a MOSFET
- CO2 Derive static and dynamic characteristics of digital CMOS circuits
- CO3 Design and simulate static and dynamic CMOS logic circuits for a given functionality and speed, power consumption and area requirements
- CO4 Design SRAM and DRAM cells using CMOS
- CO5 Sumarize different types of PCBs and their design considerations for manufacturability

Unit-1 VLSI Design flow

VLSI Design flow, general design methodologies, Mapping algorithms into Architectures: Signal flow graph, data dependences, data-path synthesis, control structures, critical path and worst case timing analysis, concept of hierarchical system design; Data-path element: Data-path design philosophies, fast adder, multiplier, driver etc.

Unit-2 Algorithm to Architecture

Efficient technique/s for Algorithm to Architecture Mapping Recent Trends on Adder/Subtractor /Multiplier/Divider Design, Efficient VLSI Architectures for Various DSP blocks (FIR filter, CORDIC, FFT etc)

Unit-3 Data-path optimization

Data-path optimization, application specific combinatorial and sequential circuit design, Pipeline and parallel architectures: Architecture for real time systems, latency and throughput related issues, clocking strategy, power conscious structures, array architectures; Control strategies: Hardware implementation of various control structures, micro-programmed control techniques, VLIW architecture

Unit-4 Efficient VLSI Architectures

Efficient VLSI Architectures for Various DSP blocks , Fundamentals of Efficient Design and Implementation strategies of Digital VLSI Design (Clock Tree synthesis, Timing Closure, Synthesis Static Timing Analysis, Clock Skew, Digital VLSI based IC design

Unit 5 Trade-off issues

Department of Electronics and Communication
Scheme and Syllabus

Optimization with regard to speed, area and power, asynchronous and low power system design, ASIC (application specific integrated circuits) and ASISP (application specific instruction set processors) design

Text Books:

1. U. Meyer-Baese, Digital Signal Processing with Field Programmable Gate Arrays, Springer-Verlag, 2001.

Reference Books:

1. S. Y. Kung, VLSI Array Processors, Prentice, Prentice-Hall, 1988.

2. K. Parhi, VLSI Digital Signal Processing Systems, Wiley & Sons, 1999.

3. J. Rabaey, A. Chandrakasan and B. Nikolic, Digital Integrated Circuits: A Design Perspective, Prentice Hall, Second Edition, 2003.

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	-	-	-	-	-	2	2
CO2	2	3	1	1	1	-	-	-	-	-	1	2
CO3	3	2	3	1	-	-	-	-	-	-	2	2
CO4	1	2	1	2	-	-	-	-	-	-	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2

SN	Category	Course Code	Course Name	Periods			Credit	Evaluation Scheme					Subject Total
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
3	PCC	EC-566	Seminar-II	0	0	4	2	0	0	0	-	100	100

Course Objectives: The objective of the seminar is to impart training to the students in collecting materials on a specific topic in the broad domain of Engineering/Science from books, journals and other sources, compressing and organizing them in a logical sequence, and presenting the matter effectively both orally and as a technical report.

Course Outcomes At the end of the course, the student should be able to:

- Organize and illustrate technical documentation with scientific rigor and adequate literal standards on the chosen topic strictly abiding by professional ethics while reporting results and stating claims
- CO1 Demonstrate communication skills in conveying the technical documentation via oral presentations using modern presentation tools.
- CO2 To impart training to students to face audience and present their ideas and thus creating in them self esteem and courage that are essential for engineers.
- CO3 To assess the debating capability of the student to present a technical topic.
- CO4 Learn to publish their contents in in reputed confrence/journals

Individual students are required to choose a topic of their interest from their M.Tech ECE curriculum or related topics from outside the M.Tech syllabus and give a seminar on that topic about 20 minutes. A committee consisting of at least three faculty members preferably Expertise in respective fields shall assess the presentation of the seminar and award marks to the students.

Each student shall submit two copies of a write up of his/her seminar topic. One copy shall be returned to the student after duly certifying it by the chairman of the

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	-	-	-	-	-	2	2
CO2	2	3	1	1	1	-	-	-	-	-	1	2
CO3	3	2	3	1	-	-	-	-	-	-	2	2
CO4	1	2	1	2	-	-	-	-	-	-	2	1
CO5	2	3	3	3	-	-	-	-	-	-	1	2

SN	Category	Course Code	Course Name	Periods			Credit	Evaluation Scheme					Subject Total
				L	T	P		Theory			Practical		
								ABQ	MSE	ESE	IP	EXP	
4	PCC	EC-568	Dissertation Phase-II	3	1	-	15	-	-	-	-	100	100

Course Objectives:

- 1 Ability to synthesize knowledge and skills previously gained and applied to an in-depth study and execution of new technical problem
- 2 Capable to select from different methodologies, methods and forms of analysis to produce a suitable research design, and justify their design.
- 3 Ability to present the findings of their technical solution in a written report.
- 4 Presenting the work in International/ National conference or reputed journals

Course Outcomes At the end of the course, the student should be able to:

- CO1 Develop aptitude for research and independent learning.
- CO2 Demonstrate the ability to carry out literature survey and select unresolved problems in the domain of the selected project topic
- CO3 Gain the expertise to use new tools and techniques for the design and development.
- CO4 Acquire the knowledge and awareness to carry out cost-effective and environment friendly designs.
- CO5 Develop the ability to write good technical report, to make oral presentation of the work, and to publish the work in reputed conferences/journals.

The dissertation / project topic should be selected / chosen to ensure the satisfaction of the urgent need to establish a direct link between education, national development and productivity and thus reduce the gap between the world of work and the world of study.

The dissertation should have the following

- i Relevance to social needs of society
- ii Relevance to value addition to existing facilities in the institute
- iii Relevance to industry need
- iv Problems of national importance
- v Research and development in various domain The student should complete the following
- vi Literature survey Problem Definition
- vii Motivation for study and Objectives
- viii Preliminary design / feasibility / modular approaches



Lingaya's Vidyapeeth
Deemed to be University
u/s of UGC Act 1956, Government of India

School of Education

Co's of Academic Session 2021-23

Batch 2021-22

SEMESTER- I

Programme Educational Objectives (PEO)

Programme Educational Objectives of B.Ed. programme are the following:

PEO1: To acquire pedagogical skills, reflective practice and ability to adapt instruction to the needs of each individual as well as group as curriculum and instructional designer.

PEO2: To apply tools and techniques to assessment and plan for education in the schools.

PEO3: To work professionally as teacher in all educational settings with lifelong learning adhering to ethical standards of teaching.

PEO4: To promote technology enabled teaching learning process with working knowledge of information and communication technology.

Mapping of PEOs with Mission Statements

PEO Statements	School	School	School
	Mission 1	Mission 2	Mission 3
PEO1:	1	3	2
PEO2:	2	3	3

PEO3:	3	2	3
PEO4:	2	3	3

Enter correlation levels 1, 2, or 3 are defined as below:

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

If there is no correlation, put '-'

Program Outcomes (PO's)

On Successful completion of Bachelor of Education (B.Ed.) the student teachers will be able:

PO1: To gain knowledge to explore the educational thoughts of Indian and western thinkers and practice their educational implications while transacting the school curriculum.

PO2: To comprehend the nature of learners by applying the educational principles of philosophical, psychological and sociological foundations in classroom situation.

PO3: To apply Blooms taxonomy of behavioral objectives in the teaching learning process and assess the student's learning outcomes in terms of teacher made test and standardized test.

PO4: To integrate ICT enabled education in developing the educational technology tools and apply them in their curriculum transaction.

Mapping of Program Outcome with Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4
PO1	2	-	2	1
PO2	3	2	3	-
PO3	3	3	2	-
PO4	2	2	-	3

correlation levels 1, 2, or 3 are defined as below:

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

If there is no correlation, '-' is put.

Program Specific Outcomes (PSO's)

On Successful completion of Bachelor of Education(B.Ed.), the student teachers will be able:

PSO1: Acquire knowledge about the theories and ideals of different educational thinkers.

PSO2: Understand the role and responsibilities of central agencies like NCTE, NCERT, UGC, NIEPA in implementing the functions of higher education system in India.

PSO3: Apply teaching skills and technique to make classroom teaching-learning more interesting.

PSO4: Correlate the development of education in India in comparative perspective.

Course Title: Childhood and Growing Up

Course Code: BED101

Objectives of the Course: • To understand the nature and stages of Growth and Development.

- To reflect upon issues and concerns of childhood and Adolescence.
- To expand awareness with respect to the role of different agencies in the healthy development of children.
- To understand socio-political realities constructing and defining different childhoods.

Course Title: Philosophical Foundations of Education

Course Code: BED103

Objectives of the Course:

- To gain an understanding of the concept, meaning and aims of education and the inter-relation of education and philosophy.
- To reflect upon the thoughts of Indian and Western thinkers on education and explore the implications of the concepts involved in educational practices.
- To promote clarity and coherence in explaining philosophical concepts, theories, and policies
- To build up their capacity to be able to formulate their response to the concerns in education.

Course Title: Language Across the Curriculum

Course Code: B.Ed. 105

Objectives of the Course:

- To understand language as a medium for comprehending ideas, reflection and thinking and for expression and communication.
- To understand the different theories of language acquisition.
- To develop competencies in fostering the language skills among school children.
- To develop sensitivity and competency towards catering to a multilingual audience

Course Title: Understanding Disciplines and Subjects

Course Code: BED107

Objectives of the Course:

- To understand the concept of discipline and subjects
- To explain the process of concept formation.
- To reflect upon the pedagogic practices and process of learning.
- To identify and comprehend academic interest on the basis of attitude, aptitude and interest of learners.

Course: Critical Understanding of ICT

Course Code: BED 109

Objectives of the course

- To equip student teachers in the effective use of ICT tools, software applications and digital resources.
- To familiarize them with the understanding and skills of integration of ICT in teaching learning, evaluation and management of an institution.
- To acquire the skill of organizing and creating her/his own digital resources.
- To sensitize them to practice safe, ethical and legal ways of using ICT.
- To enable them to use ICT for making classroom processes more inclusive and supportive in addressing multiple learning abilities.

Course Title: School Organization and Management

Course Code: BED111

Objectives of the Course:

- To enable the student-teachers to understand the meaning, nature, scope, functions and principles of Educational Administration of a School.
- To develop an understanding of leadership qualities and accountability to be maintained by the different school personnel.
- To develop an understanding of the concept of quality enhancement & management in schools.
- To acquaint the students with specific problems of school management.

Course Title: Understanding the Self

Course Code: BED151

Objectives of the Course:

- To develop the capacity for sensitivity, life skills to understand self, sound communication and ways to establish peace and harmony.
- To develop the capacity to facilitate personal growth and social skills in their own students.
- To enable student-teachers to recall and reflect on their own educational journeys and become conscious of factors those have shaped their aspirations and expectations.
- To enable student-teachers to become more conscious of their responses to experiences, observations of life situations, as also of ideas and issues that arise in their minds, and to thus develop their capacity for reflection

Course Title: Preliminary School Engagement (PSE-1) (Two Weeks)

Course Code: BED153

- Writing a reflective journal on observation of regular class room teaching with respect to pedagogical practices and class room management techniques used by the teachers.
- Reflection on roles and responsibilities of different school staff (viz. Managerial, Teaching and Non-teaching Staff) and Critical study of the infrastructural facilities, namely Library, Laboratories, Playground, Canteen, Sports facilities, Seminar Halls, Auditorium etc. which are available in the school.
- The student- teacher shall also undertake the field activities pertaining to the practical's during this period. Course Expected Outcomes

SEMESTER- II

Course Title: Learning and Teaching

Course Code: BED102

Objectives of the Course:

- To foster a comprehensive understanding of the concept of development, learning and teaching.
- To critically examine different theoretical perspectives of learning and their applications with special reference to diverse socio-cultural context
- To understand various processes that facilitate the construction of knowledge
- To examine the concept, nature and theories of intelligence and motivation • To reflect on the theories of personality and methods of adjustment.

Course Title: Contemporary perspectives in Education

Course Code: BED 104

Objectives of the Course:

- To understand the contemporary development of Indian Education.
- To explain the concept of Globalization, Liberalization and Privatization.
- To understand the socio-cultural context of Indian Education.

- To reflect upon the social issues in education

Course Title: Assessment of Learning

Course Code: BED106

Objectives of the Course:

- To understand The Nature, Purpose & Types of Educational Assessment & Evaluation.
- To comprehend various Tools & Techniques of Evaluation.
- To analyze & interpret result of the Assessment qualitatively and by using Elementary Statistical Methods
- To analyze the recent Trends & Issues in Learning Assessment

Course Title: Experiential Learning

Course Code: BED108

Objectives of the Course:

- To enable the student-teachers to master the theory and models of Experiential Learning,
- To enable them to identify the projectable and non-projectable course-contents of their methodology subjects,
- To enable them to transact the non-projectable topics through Experiential Learning,
- To enable them to make use of different methods of teaching through Experiential Learning,
- To enable them to identify experiential activities at the different levels of school education, and
- To enable the student-teachers to follow experiential learning in completing their teaching-learning transaction as suggested in the NPE-2020.

Course Title: Entrepreneurial Mindset

Course Code: BED 110

Course Objectives:

- To provide a foundation for basic entrepreneurial skills and to acquaint them with the world of entrepreneurship and inspire them to set up and manage their businesses.
- To acquaint students with the process of creativity and innovation

- To expose students to various aspects of entrepreneurship and business
- To expose students to case studies on successful entrepreneurs.

Course Title: Reading and Reflecting on Texts

Course Code: BED152

Objectives of the Course:

- Develop Proficiency in Reading, Reflecting and Responding to a variety of written texts in different ways.
- Enhance Creative and Critical Thinking of the students – teachers by critically analysing the texts & Audio-Visual Resources. Course Outcomes:
- Develop Meta – Cognitive Awareness in student-teachers to become conscious of their own thinking processes as they engage with diverse texts.
- Reflect on the ideas expressed in the texts to plan, draft, edit and present a piece of writing related to their understanding of a texts & Audio-Visual Resources

Course Title: Preliminary School EngagementPSE-2 (2weeks)

Course Code: BED154

Objectives of the Course:

- To organize co-curricular activities at school.
- To undertake a reflective writing on prevalent assessment practices at schools with special reference to Continuous and Comprehensive Evaluation.
- To develop understanding about diverse needs, interests and aspirations of the learners and its significance in organizing school activities for holistic development.
- To appreciate the significance of preparing reflective journals in recording field activities undertaken during school engagement

PEDAGOGICAL COURSES

Course Title: Teaching of English

Course Code: BED 116

Objectives of the course:

- To understand the need & importance of English language and develop proficiency in the language.
- To extend awareness of the pedagogical practices of teaching English.
- To facilitate the effective use of learning resources.
- To understand the process of language assessment and continuous professional development
- To develop activities and tasks for learners including audio-video materials, ICT and internet.

Course Title: Teaching of Mathematics

Course Code: BED122

Objectives of the course:

- To understand the nature and value of mathematics and its place in curriculum.
- To understand the historical developments leading to concepts in modern Mathematics.
- To improve the competencies in secondary level Mathematics.
- To understand the various instructional strategies and their appropriate use in teaching Mathematics at the secondary level.
- To apply appropriate, method, strategies and evaluation techniques in teaching of Mathematics.

Course Title: Teaching of Social Science

Course Code: BED124

Objectives of the course:

- To develop understanding about the basic differences between Social Studies and Social Sciences.
- To develop the ability to justify the relevance of social Sciences in terms of Contemporary events.
- To acquire knowledge about the different approaches associated with the discipline
- To develop certain professional skills useful for classroom teaching.
- To identify, prepare and collect different teaching Aids & use them effectively in the classroom.

Course Title: Teaching of Accountancy

Course Code BED128

Objectives of the course:

- To understand of the nature and rationale of Accountancy as a subject in the school curriculum.
- To use of workbooks and practice sets for gaining practical knowledge of the world of Accountancy.
- To expand awareness about curricular innovations in Accountancy.
- To develop the competencies for transacting the accountancy curriculum.
- To familiarize with the techniques of evaluation and to analyze the digital platforms and e-assessment for Accountancy.

Course Title: Teaching of Business Studies

Course Code: BED130

Objectives of the course:

- To understand the rationale of teaching Business Studies at the School level.
- To develop the skill of developing and transacting curriculum of Business Studies.
- To develop the tools and techniques of evaluation for appraising and enhancing students' knowledge and performance in Business Studies.
- To analyze and use the digital platforms and e-assessment.

Course Title: Teaching of Political Science

Course Code: BED 132

Objectives of the Course:

- To enrich the knowledge of pupil teachers along with promoting reflective thinking and skill of expression.
- To develop respect for human values such as respect for all persons, empathy, tolerance, gender equality, non-violence, inclusion and equity
- To develop the potential for perspective building located in the Indian socio-political culture through practicum tasks, academic discourse and classroom discussions.
- To develop and inculcate rational and scientific outlook.

- To prepare for responsible citizenship and to inculcate democratic values.

Course Title: Teaching of Economics

Course Code BED134

Objectives of the course:

- To familiarize the student-teachers with various strategies, methods, techniques and Skills of teaching Economics at the senior secondary level.
- To develop competence in use of appropriate strategy in relation to the content to be taught.
- To develop competence in designing effective instructional strategies to teach Economics
- To develop ability to design, develop; and use various tools & techniques of Evaluation.
- To develop awareness about recent advancements in teaching of Economics.

Course Title: Teaching of Geography

Course Code: BED136

Objectives of the course:

- To equip the student-teachers to establish correlation between geographic Knowledge and cultural background and to develop geographic sense.

To understand the inter relationships between different Subjects, Disciplines and Geography

- To develop an understanding of the need for Teaching and Learning Geography.
- To make use of various methods of teaching Geography.
- To acquaint with the techniques of evaluation in Geography.

Course Title: Teaching of History

Course Code: BED 138

Course Objectives:

- To understand the importance of History and its place in school curriculum.
- To equip student-teachers with the techniques of evaluation in History.
- To develop the efficiency in using audio-visual aids, graph, timeline and resource material in History

- To practice learner centered methods and techniques in the classroom.
- To develop a sense of pride in our History and Culture.

Course Title: Teaching of Integrated Science

Course Code: BED140

Objectives of the Course:

- To analyze critically the curriculum and textbooks from the dimensions of integration at various levels of school
- To acquire and learn skills of preparing lesson plans using various approaches and methods.
- To acquire and learn specific laboratory skills to conduct practical work in science
- To develop and use the techniques for evaluation of students' performance.
- To understand the importance of Professional Development of a science teacher

Course Title: Teaching of Physics

Course Code: BED142

Objectives of the Course:

- To develop an understanding of the nature of Physics and its interface with society.
- To acquire and learn specific laboratory skills for conducting and facilitating practical and laboratory work in Physics.
- To develop and use the techniques for assessment of student's performance.
- To critically analyze the Curriculum and textbooks from the dimension of development of Scientific Values.
- To acquaint with advancements in technology and their integration with pedagogy.

Course Title: Teaching of Chemistry

Course Code: BED144

Objectives of the Course:

- To analyze critically the curriculum of teaching of Chemistry in school.
- To develop the abilities for planning and organizing chemistry laboratory.

- To understand various learning experiences and usage of teaching aids in chemistry.
- To develop professional competencies skills related to teaching Chemistry at school level.
- To construct appropriate assessment tool for evaluating chemistry.

Course Title: Teaching of Biology

Course Code: BED146

Objectives of the Course:

- To develop in student-teachers an understanding of the nature of Biology and its interface with Society
- To acquire and learn specific laboratory skills and technological skills to conduct practical work in Biology.
- To develop the techniques of regular assessment for continuous review of progress of students' performance.
- To evolve as a reflective practitioner through use of innovative practices in the teaching of Biology.

SEM-III

INTERNSHIP

Course Code: BED251, BED253, BED255 & BED257

Credits: 20

. Objectives of the Course:

- To observe children and the teaching learning process in a systematic manner.
- To learn to relate to and communicate with children.
- To learn the nuances of the practice of teaching in a School using appropriate methods, materials and skills
- To evaluate school textbooks and other resource material critically in the context of Children's development and pedagogic approach used.
- To develop a repertoire of resources this can be used by the intern later in his/her teaching – textbooks, children's literature, activities and games, planning excursions
- To reflect critically on practice by visiting a learning Centre.

SEMESTER- IV

Course Title: Gender, School and Society

Course Code: BED202

Objectives of the Course:

- To develop an understanding of the paradigm shift from Women studies to Gender Studies based on the historical backdrop.
- To reflect on different theories of Gender and Education.
- To analyze the institutions involved in Socialization processes and see how socialization practices impact power relations and identity formation.
- To foster gender sensitization in the classroom

Course Title: Knowledge and Curriculum Perspectives in Education

Course Code: BED204

Objectives of the Course:

- To enable student teachers to understand the meaning of the term Knowledge and Curriculum.
- To explore the role of School as an organization and its culture along with the teachers in operationalizing and developing, a contextually responsive 'Curriculum' which fosters the spirit of Critical Pedagogy.
- To familiarize student-teachers with the recommendation of NCF 2005 and NPE 2020 pertaining to Curriculum and Schooling.
- To gain insight about Knowledge and Construction of Knowledge.

Course Title: Guidance and Counselling

Course Code: BED206

Objectives of the Course: ● To appreciate the nature, need, principles for guidance and counseling

- To familiarize the responsibilities and moral obligation of teacher as a guide and Counsellor
- To develop capacity of applying the techniques and procedures of guidance and Counselling

- To facilitate career development of all the different types of students.

Course Title: Environmental Education

Course Code: BED208

Objectives of the Course:

- To understand and reflect on the concept and characteristics of environmental education from various aspects.
- To develop awareness understanding and concern about environment and associated problems.
- To develop critical insights about the environment, through the environment and for the environment.
- To develop awareness about sustainable development goals.

Course Title: Creating an Inclusive School

Course Code: BED210

Objectives of the Course:

- To familiarize student- teachers with the concept of Inclusive Education and appreciate its Philosophy in the context of Education for All.
- To identify and address the diverse needs of all learners.
- To acquaint with the trends and issues in Inclusive Education
- To develop capacity of student- teachers for creating an inclusive School
- To appreciate various inclusive practices to promote Inclusion in the classroom.

Course Title: Human Rights and Value Education

Course Code: BED212A

Objectives of the Course:

- To understand the need and importance of value-education and education for Human Rights as a duty.

To orient themselves on duty-conscious ethics and morality based on a rational understanding of moral personality development of oneself and the child.

- To comprehend the process of moral personality development vis-à-vis as a means of their cognitive and social development.
- To draw lessons from principles of life and converting them into moral learning towards moral education.

Course Title: Health and Physical Education

Course Code: BED212B

Objectives of the Course:

- To acquaint pupil teachers with the concept of holistic health.
- To enable them to understand the various dimensions & determinants of health.
- To acquaint them to school health program and its importance.
- To enable them to understand the need & importance of Physical Education.
- To develop organisation skills in organising inter house tournaments and sports meet.
- To understand the need and relevance of Yoga and develop the skills in yogic practices.

Course Title: Adult and Population Education

Course Code: BED212C

Objectives of the Course:

- To enable the student teachers to develop an understanding of the meaning and concept of Adult Education.
- To impart knowledge to student teachers about the problems and difficulties coming in the way of achieving full literacy in the country.
- To acquaint the student teachers with chief characteristics of an adult learner, different methods and evaluation techniques of adult learning.
- To be aware of the population trends and spread of AIDS in the world.
- To understand that population becomes stable when there is little difference between birth and death rates.

Course Title: Peace Education

Course Code: BED 212D

Objectives of the Course:

- To understand the concept of peace as an umbrella concept of all positive values.
- To understand the importance of peace education in personality development.
- To imbibe the knowledge, attitudes and skills of culture of peace needed to achieve and sustain a global culture of peace and values
- To make future teachers aware of the scale and variety of conflicts affecting contemporary life and learn to deal with them through unilateral ethics • To analyse the need for Peace Education to foster National and International Understanding.

Course Title: Work Education

Course Code: BED-212E

Objectives of the Course:

- To acquire knowledge of the various aspects of vocational education in India.
- To understand the dynamics of the development of vocational programmes in India with respect those which play a significant role in increasing productivity.
- To develop healthy attitude towards vocational education.
- To appreciate the significant changes in the field of vocational education in India.

Course Title: Education of the Marginalized Groups

Course Code: BED -212F

Objectives of the Course:

- To acquaint the student-teachers of their constitutional rights and duties.
- To sensitize students towards the paradigm shift from welfare approach to development.
- To the rights-based approach.
- To understand the relevance of Right to Education as a tool for social empowerment of the marginalized sections of India.

Course Title: Life Skills Education

Course Code: BED-125

Objectives of the Course:

- To familiarize student-teachers in the theoretical foundations of Life Skills Education.
- To prepare student-teachers in training methodologies and enable students to apply Life Skills in various spheres
- To develop professionals in Life Skills Education and enhance the ability to contribute as youth workers specialized in the area of Life Skills Education.
- To foster the spirit of social responsibility in students and enhance social and emotional well being.

Course Title: School Leadership

Course Code: BED -212H

Objectives of the Course:

- To develop a critical understanding of the notion of school organization.
- To develop a comprehensive understanding of context-specific notions of school effectiveness.
- To develop an understanding of school leadership and challenges to management.
- To help in making overt connections between field-based project work, educational leadership and change facilitation.

Course Title: Reflection on School Experience

Course Code: BED-252

Reflection has many facets. For example, reflecting on work enhances its meaning. Reflecting on experiences encourages insight and complex learning. We foster our own growth when we control our learning, so some reflection is best done alone. Reflection is also enhanced, however, when we ponder our learning with others. Reflection involves linking a current experience to previous learning (a process called Scaffolding). Reflection also involves drawing forth cognitive and emotional information from several sources: visual, auditory, kinesthetic, and tactile. To reflect, we must act upon and process the information, synthesizing and evaluating the data. In the end, reflecting also means applying what we've learned to contexts beyond the original situations in which we learned something.

Course Title: Drama and Art in Education

Course Code: BED-254

Objectives of the Course:

- To develop basic understanding of different Art forms – impact of Art forms on the human mind.
- To enhance artistic and aesthetic sensibility of learners to enable them to respond to the beauty in different Art forms, through genuine exploration, experience and free expression.
- To develop skills for integrating different Art forms across school curriculum at secondary level.
- To create awareness of the rich cultural heritage, artists and artisans Course Content.

**Master of Education (M.Ed.) Programme
(Two Years)**

SESSION 2021-23

Programme Educational Objectives (PEO)

Programme Educational Objectives of M.Ed. programme are the following:

PEO1: To acquire pedagogical skills, reflective practice and ability to adapt instruction to the needs of each individual as well as group as curriculum and instructional designer.

PEO2: To apply tools and techniques to assess and plan for education in the schools and colleges of Education.

PEO3: To work professionally as teacher educator in all educational settings with lifelong learning adhering to ethical standards of teaching.

PEO4: To promote technology enabled teaching learning process with working knowledge of information and communication technology

Mapping of PEOs with Mission Statements

PEO Statements	School Mission 1	School Mission 1	School Mission 1
PEO1:	1	3	2
PEO2:	2	3	3
PEO3:	3	2	3
PEO4:	2	3	3

Program Outcomes (PO's)

On Successful completion of Master of Education (M.Ed.), the student teachers will be able:

PO1: To gain knowledge to explore the educational thoughts of Indian and western thinkers and practice their educational implications while transacting the school curriculum.

PO2: To comprehend the nature of learners by applying the educational principles of philosophical, psychological and sociological foundations in classroom situation.

PO3: To apply Blooms taxonomy of behavioral objectives in the teaching learning process and assess the students' learning outcomes in terms of teacher made test and standardized test.

PO4: To integrate ICT enabled education in developing the educational technology tools and apply them in their curriculum transaction.

Mapping of Program Outcome with Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4
PEO1:	2	-	2	1
PEO2:	3	2	3	-
PEO3:	3	3	2	-
PEO4:	2	2	-	3

Program Specific Outcomes (PSO's)

On Successful completion of Master of Education (M.Ed.), the student teachers will be able:

PSO1: Acquire knowledge about the theories and ideals of different educational thinkers.

PSO2: Understand the role and responsibilities of central agencies like NCTE, NCERT, UGC, NIEPA in implementing the functions of higher education system in India.

PSO3: Analyze and familiarize the principles underlying in the pre service teacher education programs at primary, secondary and higher secondary level. **PSO4:** Correlate the development of education in India in comparative perspective

SEMESTER I

Course Title: Historical and Political Perspectives of Education

Course Code: MED 101

Credits: 4

Course Objectives: The students will be able to

- Understand the pre-independence and post-independence development of education in India.
- Understand the factors from historical perspective that contributed to present education system.
- Explain the important features of various reports, commissions and policies of education during pre- and post-independence development of Education - in India.
- Understand that development of Education is influenced by political forces of the time.

Course Outcomes:

- To summarize the historical perspectives of Indian Education in the pre independence era.
- To formulate an experience of Indian Education system in the post-independence era.
- To develop an understanding about constitutional provisions regarding education.
- To relate Political perspectives of education in the Indian Context.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	3	2	-	-	3	3	2	2
CO2	3	1	-	-	3	3	-	2
CO3	-	-	-	-	-	-	1	1
CO4	2	-	-	2	2	-	2	2

Course Title: Educational Psychology

Course Code: MED 102

Credits: 4

Course Objectives: The students will be able to

- Understand the relevance of psychological perspective of education.
- Get acquainted with the process of assessment of personality.
- Understand the dynamics of intelligence and learning
- Apply the learning principles in classroom situations.

Course Outcomes:

- To analyze various stages of development with reference to adolescence.
- To comprehend the impact of heredity and environment in the development of personality.
- To understand about learner and learning.
- To reflect upon memory and its psychological implication on various theories of learning and intelligence.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	2	3	2	1	1	3	1
CO2	-	3	2	1	1	1	1	2
CO3	2	3	3	2	1	-	2	1
CO4	1	2	2	1	2	-	1	2

Course Title: Research Methodology in Education

Course Code: MED 103

Credits: 4

Course Objectives: The students will be able to

- Get familiarized with the basic terms of research methodology.
- Develop understanding of concept of research in general and educational research in particular.
- Develop understanding of distinctive features of qualitative and quantitative research paradigms.
- Acquaint the students with respect to different techniques of research.

Course Outcomes:

- To define nature and types of educational research
- To demonstrate an understanding of various data collection tools and sampling
- To apply knowledge of research design and procedure
- To analyze descriptive and inferential statistics

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	-	2	3	-	-	-	-
CO2	-	1	-	2	-	-	-	2
CO3	-	-	-	2	-	-	-	-
CO4	-	1	1	2	-	3	-	-

Course Title: Educational Studies

Course Code: MED 104

Credits: 4

Course Objectives: The students will be able to

- Understand the meaning, functions and aims of education
- Comprehend the nature of education studies and map the fields in present scenario.
- Introduce certain selected seminal educational texts representing the foundational perspectives.
- Get oriented to the institutions, systems and structures of education and flag the contemporary concerns of education policy and practice.

Course outcomes:

- To outline theoretical perspectives of Indian & Western Education thinkers
- To relate upon views of eminent educators
- To compare different schools of philosophies of Education
- To distinguish socio cultural context of Education

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	-	3	-	-	2
CO2	3	2	2	-	3	2	-	2
CO3	2	3	-	-	3	-	-	2
CO4	1	2	1	-	2	2	-	1

Course Title: Educational Measurement and Evaluation

Course Code: MED 109

Credits: 4

Course Objectives: The students will be able to

- Mention the purposes of measurement and evaluation
- Describe the taxonomy and domains of educational objectives
- List the uses and types of tests used in the classroom
- Explain the reliability and validity of a test as an instrument

Course Outcomes:

- To develop relevant educational assessment
- To evaluate tests using statistical and qualitative methods

- To identify flaws in educational assessments
- To understand the utility of educational assessments within the broader context of educational policy and decision making

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	-	2	2	-	2	-	2
CO2	-	1	2	3	-	1	1	-
CO3	-	-	1	2	-	2	2	-
CO4	-	3	3	3	-	3	3	3

Course Title: Communication and Expository Writing

Course Code: MED 192

Credits: 2

Course Objectives: The students will be able to

- Listen, converse, speak, present and explain ideas in groups and before an audience.
- Use ICT in effective communication.
- Understand about writing skills and enhance their expository writing skills.
- Implement their knowledge of communication in classroom discussion and in daily life.

Course outcomes:

- To describe ideas with clarity & relevance
- To interpret the role of ICT in effective communication
- To synthesize academic representation with effective writing skills
- To employ academic listening skills

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	3	3	3
CO2	-	-	3	3	-	2	2	-
CO3	2	1	3	3	-	-	1	-
CO4	3	3	3	3	3	3	3	3

Course Title: Self-Development

Course Code: MED 193

Credits: 2

Course Objectives: The students will be able to

- Understand what they are and what they want to be?
- Take responsibility for self- development, self-exploration and self-evolution.
- Know oneself and through those knowing surroundings (including human and other living beings.)

Course Outcomes:

- To recognize the significance of yoga for integrated personality
- To practice stress relieving measures
- To discover the concept of self-development
- To assess the importance of human values

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	1	2	-	1	-	-	-
CO2	-	-	-	-	2	2	1	1
CO3	3	2	2	2	3	-	2	2
CO4	3	3	3	3	3	-	3	-

SEMESTER II

Course Title: Philosophical Foundations of Education

Course Code: MED 105

Credits: 4

Course Objectives: The students will be able to

- Understand the relevance of Philosophy as a liberal discipline and a critical inquiry process
- Undertake Philosophical enquiry as the basis of all educational endeavors
- Sensitize students to the concerns of human beings and the contributions of Philosophy there in
- Appreciate the contribution of Western philosophy and Indian Philosophy to Education

Course outcomes:

- To understand Indian and western philosophy and their educational implications

- To identify the relevance and contribution of western schools of philosophy
- To critically analyze and examine any philosopher
- To critically analyze educational issues and its relevance in the present scenario.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	3	1	2	1	3	-	1	3
CO2	3	3	1	-	3	2	1	2
CO3	3	3	2	1	3	1	1	2
CO4	3	3	3	-	3	-	3	3

Course Title: Sociology of Education

Course Code: MED 106

Credits: 4

Course Objectives: The students will be able to

- Understand the social nature of education
- Realize the need of studying education with sociological perspectives
- Understand the relationship of different social institutions with education
- Understand the role of education and change

Course Outcomes:

- To understand the relationship between society and education
- To apply the principles of sociology of education in learning process
- To understand the role of new technology in the changing social content
- To understand and analyze the changing nature of society and education in 21st century

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	3	2	1	3	2	2	3
CO2	2	3	2	2	1	1	3	2
CO3	2	3	2	3	1	2	2	1
CO4	1	3	2	3	1	2	2	2

Course Title: Curriculum Studies in Education

Course Code: MED 107

Credits: 4

Course Objectives: The students will be able to

- Explain the significance of curriculum as a field of study in Teacher Education.
- Get sensitized to curriculum as a process, product and praxis.
- Develop critical understanding on various issues of curriculum as a discipline and across disciplines.
- Acquaint students with the different aspects of curriculum evaluation.

Course Outcomes:

- Identify various methods and approaches in transaction of curriculum for particular school subject
- Identify factors to optimize gaps between curriculum framing and teacher pedagogy
- Prepare and evaluate of different curricular materials, specific subject and teacher guide
- Critically evaluate present National Curriculum Frameworks 2000 and 2005

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	2	2	3	-	2	3	2
CO2	-	1	2	3	-	3	3	2
CO3	-	2	3	3	1	-	2	1
CO4	-	1	2	2	-	3	2	2

Course Title: Teacher Education

Course Code: MED 108

Credits: 4

Course Objectives: The students will be able to

- Get sensitized to the aims and development of teacher education in India.
- Develop an understanding of the teacher education curriculum in India.
- Acquaint with the competencies essential for a teacher for effective transaction.
- Get equipped with the skills to become effective and efficient teachers and teacher-educators.

Course Outcomes:

- To enable the students to understand the meaning, need, importance, aims, objectives and scope of teacher education and appreciate the historical development
- To enable the learners to understand the structure, administrative agencies, curriculum methodology and evaluation of teacher education programs in the country
- To help the students to understand the evaluation procedure of pre-service and inservice teacher education programs in India.
- To understand the school functioning mechanisms

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	1	2	1	-	3	3	3
CO2	1	1	2	3	1	3	3	3
CO3	-	-	1	2	-	3	3	3
CO4	-	-	2	3	-	3	3	3

Course Title: Dissertation

Course Code: MED 194

Credits: 4

Dissertation

- Teacher educator will facilitate the areas of research related to educational issues.
- Students are expected to take up a research-based project on an area of interest, which is associated with optional/specialization course or challenges faced /Recent needs and trends.
- Identification of the problem and its statement.
- Preparation of Synopsis/Research Proposal.

Course Outcomes:

- To explore educational research problems.
- To prepare and present a research proposal.
- To develop research skills of administrating research tools and data collection.
- To use statistical techniques and software (SPSS) for data analyzing.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
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CO1	1	2	2	3	1	3	3	3
CO2	1	-	1	1	-	-	-	2
CO3	2	-	-	2	1	-	2	3
CO4	3	1	2	2	3	1	2	2

Course Title: Internship in Teacher Education Institutions

Course Code: MED 195

Credits: 4

Internship will be organized with deputation to both pre- service as well as in- service teacher education institutions setting for 3 weeks such as CBSE, NUEPA, NCERT, SCERT, DIETs, IASE, NGOs, Curriculum Development Bodies, University Education Departments, Colleges of Education etc.

Necessary orientations to the students, teachers, concerned supervisor and teacher educators from the respective institutions of teacher education need to be provided before organizing the internship.

Couse Outcomes:

- Internalize the working of teacher training institutions.
- Develop insight about the roles and responsibilities of teacher training institutions. • Create an interface of theory and practice.
- Relate the understanding of functioning of teacher education institutions and develop teaching skill

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3

SEMESTER III

Course Title: Advance Research Methodology

Course Code: MED 209

Credits: 4

Course Objectives: The students will be able to

- Understand concept, Characteristics & Themes of Qualitative& Quantitative Research.
- Examine different types of qualitative& quantitative research and their characteristics.

- Examine the concept of Qualitative& Quantitative Research.
- Develop a tool, which allows for the evaluation and data collection of Qualitative& Quantitative Research.

Course Outcomes:

- To understand descriptive and inferential statistical techniques.
- To learn tabulation of data and representation of graphs.
- To analyze qualitative and quantitative data in educational research.
- To differentiate and apply parametric and non-parametric inferential techniques

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	2	3	3	-	-	-	-
CO2	-	1	2	3	-	-	2	2
CO3	-	2	3	3	-	1	2	1
CO4	-	1	3	3	-	1	1	1

Course Title: In-Service Teacher Education in India

Course Code: MED 210

Credits: 4

Course Objectives: The students will be able to

- Gain insight and reflect on the status of in-service teacher education.
- Reflect on the nature and objectives and components of in-service teacher education programmes
- Examine the existing teacher education curricula from the viewpoint of policy, its relevance to the demands of present-day school realities.

Course Outcomes:

- To analyze policies, reports and recommendations of Commissions and Committees on Teacher Education
- To review National Curriculum Framework for Teacher Education 2009 and its implications in the schools.
- To identify the factors affecting professional development of teachers.
- To explore emerging trends, issues and research area of teacher education.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	-	2	2	-	3	3	3
CO2	-	2	3	3	-	3	-	2
CO3	1	1	2	2	-	3	1	2
CO4	2	1	1	1	-	3	-	3

Course Title: Elementary Education in India: Administration and Management

Course Code: MED 211

Credits: 4

Course Objectives: The students will be able to

- Sensitize the student teachers with the need and relevance of Elementary Education as a foundation stage.
- To reflect on the various concerns of Elementary Education including Access, Enrolment, Retention & Achievement
- To gain insight into factors promoting the Universalization of Elementary Education
- Develop a critical outlook towards measures taken for the achievement of quality at the Elementary Education stage

Course Outcomes:

- To understand current practices, status, recent initiatives and future prospects of Elementary Education in India.
- To study the implementation of RTE Act and SSA influencing Elementary Education in India.
- To discuss specific issues and concerns related to successful management and administration at elementary level of education.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	2	1	1	3	2
CO2	1	-	1	1	1	2	1	-
CO3	2	-	-	2	3	1	2	2
CO4	1	2	3	3	1	2	2	2

Course Title: Planning & Management at Secondary & Level

Course Code: MED 212

Credits: 4

Course Objectives: The students will be able to:

- acquaint themselves with the need, scope and purpose of educational planning in terms of national and community needs.
- determine and implement objectives of planning based on individual needs of the students.
- know different programmes and policies for realizing the constitutional obligations related to secondary education in India.
- develop an idea about the structure of secondary education in India

Course Outcomes:

- To explain the students about the need and importance of institutional planning.
- To understand commissions, policies and schemes related to secondary education.
- To determine the conceptual framework of management and administration of secondary education in India.
- To apply the various principles and techniques of educational planning in secondary education
- To survey research in achieving UEE.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	-	3	3	1	3	2	2
CO2	2	2	3	3	1	3	3	3
CO3	1	-	2	1	2	3	-	3
CO4	-	2	3	3	2	3	-	3

Course Title: Issues and Curricular Concerns at Elementary Level

Course Code: MED 213

Credits: 4

Course Objectives: The students will be able to

- Understand various schemes & programmes of Govt. for elementary education.
- Study effective practices with various curriculum transaction strategies.
- Find out research trends in elementary education.
- Select and use appropriate assessment practice to meet the needs of the students.

Course Outcomes:

- To develop curricular material for elementary level.
- To make aware about the pedagogical theories, strategies and techniques.
- To understand the curriculum, principles, basis at elementary level.
- To observe the classroom learning and A-V aids used by the teachers

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	2	1	1	3	2
CO2	1	-	1	1	1	2	1	-
CO3	2	-	-	2	3	1	2	2
CO4	1	2	3	3	1	2	2	2

Course Title: Issues & Curricular Concerns at Secondary Level**Course Code: MED 214****Credits: 4****Course Objectives: The student will be able to:**

- Examine the status of development of secondary education in India after Independence.
- Identify the problems issues of secondary school teachers and visualize the impact of Rights of children to free and Compulsory Education Act, 2009 for universalization of Secondary Education
 - understand different programmes and agencies for ensuring the quality of secondary education in India
- Reflect upon different issues, concerns and problems of secondary education in India.

Course Outcomes:

- To examine the status of development of secondary education in India after Independence
- To understand the problems and challenges related to secondary education
- To develop research insight for curriculum development in secondary education
- To understand the nature and uses of different types of tools and techniques of evaluation in secondary education

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
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CO1	-	1	1	1	1	3	-	1
CO2	2	2	-	-	2	3	2	2
CO3	-	1	-	2	-	-	-	2
CO4	-	2	3	3	1	2	1	2

Course Title: Internship in school

Course Code: MED 296

Credits: 4

Course Objectives: The students will be able to

- Experience and understand the academic and social environment of school as social Institution.
- Observe and list the developmental needs of students.
- Identify and workout practical solutions of different types of problems.
- Develop teaching competence through practice teaching and social modelling.

Course outcomes:

- To develop an understanding of technicality of teaching roles.
- To acquaint with the content organization and various activities held in Elementary schools.
- To develop with pedagogical competencies to pre-service and in- service teachers of Elementary schools.
- To examine the contributory role of teachers at Elementary Level.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	3	3	3	3	3	3	3
CO2	-	1	2	3	-	1	2	2
CO3	-	2	3	3	1	1	3	2
CO4	-	2	3	3	1	1	2	1

Course Title: Dissertation (Progress report)

Course Code: MED 297

Credits: 2

To give the background of the problem, Review of the related literature, framing a research design, selection of tools, collecting and using data in thought provokingly and in a convincing manner, analysis and tabulation of data. Writing of Research Reports with up-to-date references.

Course outcomes:

- To develop the skills of reviewing the literature.
- To develop critical thinking and research attitude.
- To collect and analyze the research data.
- To develop an insight to solve educational problems in scientific manner.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	2	2	3	1	3	3	3
CO2	1	-	1	1	-	-	-	2
CO3	2	-	-	2	1	-	2	3
CO4	3	1	2	2	3	1	2	2

Course Title: Academic Writing**Course Code: MED 298****Credits: 2****Course Objectives: The students will be able to**

- Reflect on their communicative behavior.
- Improve their communicative behavior performance
- Build capacities for self-criticism and facilitate self-growth.
- Enhance their listening & writing skills.

Course Outcomes:

- To develop the need for writing process.
- To summarize in one's own words.
- To modify their writing skills.
- To pivot critical thinking to structure an argument.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	1	2	-	-	-	-	-
CO2	-	2	2	1	-	-	-	-
CO3	-	1	-	-	-	-	-	-
CO4	-	1	3	2	-	-	-	-

SEMESTER IV

Course Title: Advance Curriculum Theory

Course Code: MED 216

Credits: 4

Course Objectives: The students will be able to

- Enhance quality of syllabus, after understanding of curriculum and concept of syllabus/analysis.
- Develop expertise/specialize in curriculum theories, models and analysis of syllabus.
- Develop capabilities of theoretical understanding of curriculum as well as practical abilities to work in these areas.
- Understand appropriate textbooks, syllabus and other curriculum material.

Course Outcomes:

- To develop an understanding of curriculum development approaches and curriculum designing
- To develop an understanding of curriculum planning
- To explain the tools and techniques in curriculum assessment and pedagogical practice
- To develop an understanding of critical analysis of curriculum

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	-	3	2	2	2	1	1
CO2	1	2	3	1	1	3	-	-
CO3	1	2	3	3	2	3	2	1
CO4	2	2	3	3	1	3	-	2

Course Title: Policy, Planning and Financing of Education

Course Code: MED 217

Credits: 4

Course Objectives: The students will be able to

- To sensitize students to the factors affecting Educational Planning in India.
- To develop critical understanding of the dynamics of Educational Management.
- To examine the process and procedures related to financing of Indian Education.

- To analyze the recent trends in Educational Management in India.

Course Outcomes:

- To develop an understanding of the concept of policy planning.
- To understand the issues and trends of financing of elementary education.
- To contrast the students about role of various bodies promoting educational planning.
- To devise the role and latest developments of different educational bodies in educational planning and management.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	-	2	1	-	3	1	1
CO2	-	-	-	-	2	3	-	-
CO3	1	1	2	2	1	3	-	-
CO4	-	-	3	3	-	3	-	2

Course Title: Educational Technology

Course Code: MED 218

Credits: 4

Course Objectives: The students will be able to

- Appreciate the relevance of Information and Communication Technology in education.
- Develop an understanding of Media Technology and Instructional System for use in education.
- Acquaint with the nature, forms, research trends and applications of Educational Technology.

Course Outcomes:

- To understand the systems approach to education and communication theories and modes of communication.
- To correlate instructional design and modes of development of self-learning material.
- To develop basic skills in the production of different types of instructional material.
- To interpret recent innovations and future perspectives of Education Technology.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	2	3	3	1	2	2	2
CO2	-	1	3	3	-	2	1	-
CO3	-	-	3	3	-	-	3	1
CO4	-	3	3	3	-	3	3	3

Course Title: Issues, Planning and Policies of Elementary Education

Course Code: MED 219

Credits: 4

Course Objectives: The students will be able to

- Gain insight into the vision and mission of Elementary Education in the country.
- Develop understanding for enhancing learner's achievement.
- Reflect on various concerns of elementary education
 - Gain insight into factors promoting success and participation in quality in elementary education.

Course Outcomes:

- To understand the constitutional provisions for Elementary Education
- To analyze the development process of Elementary Education.
- To assess the outcomes of Elementary Education.
- To describe the role of various programs for enhancing Elementary Education

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	2	3	1	1	3	-	3
CO2	3	3	3	3	3	3	-	3
CO3	-	2	2	3	2	3	3	3
CO4	-	1	2	3	1	3	2	3

Course Title: Peace Education

Course Code: MED 220

Credits: 4

Course Objectives: The students will be able to

- Appreciate the current challenges of teacher education in context with the introduction of education for peace harmony.
- Develop skills among teacher trainees in human values, harmonious living with co-existence.
- Create awareness among student teachers for development of activities for peace and harmony education.

- Articulate and identify the activities & programmes for promoting peace and harmony.
- Understand Vedic Darshan of international work for promoting peace values.

Course Outcomes:

- To differentiate peace and peace education, their relevance and connection in inner harmony as well as harmony in social relationships across individuals and groups based on constitutional values.
- To understand the critical pedagogy of peace education
 - To modify self by continual reflection leading to reduction in stereotypes and transcending barrier of identity and socialization.
- To explain the importance of skills and strategies of assessment of the peace-building processes.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	1	-	-	-	-
CO2	1	1	3	3	2	2	2-	2
CO3	3	3	3	-	1	-	-	-
CO4	-	1	3	2	-	1	1	-

Course Title: Educational, Vocational Guidance

Course Code: MED 221

Credits: 4

Course Objectives: The students will be able to

- Understand the basic principles of guidance & counselling and the application of the same to the process of education.
- Develop practical knowledge of the various techniques used in counselling.

Course Outcomes:

- To determine the history of guidance and counseling in India
- To relate the importance of guidance and counseling at primary, middle and secondary level
- To understand various techniques adopted for vocational guidance and counseling
- To develop knowledge of various techniques and tools for assessing mental health of learners

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	2	2	1	3	3	-	-
CO2	1	3	3	-	1	1	3	2
CO3	-	3	3	-	-	2	2	1
CO4	-	1	1	3	-	1	-	-

Course: Inclusive Education

Course Code: MED 222

Credits: 4

Course Objectives: The students will be able to

- Understand concept, meaning and significance of inclusive education.
- Appreciate the need for promoting inclusive practice and the roles and responsibilities of the teachers.
- Develop critical understanding of the recommendations of various commissions and committees towards teacher preparation for inclusive education and special education.
- Understand the nature of difficulties encountered by children.

Course Outcomes:

- To understand the concept and importance of inclusive education.
- To understand the educational approaches and strategies for enrichment of inclusive education.
- To understand the curriculum adaptation and evaluation for children with diverse need.
- To understand the teacher preparation for inclusive education.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	1	-	3	3	2	3	1	2
CO2	-	-	3	3	1	3	-	1
CO3	2	3	3	3	1	3	-	-
CO4	1	1	3	1	1	2	3	2

Course Title: Environmental Education

Course Code: MED 223

Credits: 4

Course Objectives: - The students will be to

- Understand the relationship between Humans Beings and their Environment.

- develop sensitivity towards Environmental Disaster Management.
- Acquire an understanding of the process of Environmental Education.
 - develop skills and competencies as teachers for Management of Environmental Awareness Programmes
- Acquire a critical understanding of the different curriculum transaction and evaluation strategies for environmental education.

Course Outcomes:

- To understand the concept, need and importance of environmental education.
- To understand the concept of environmental crisis and Management.
- To know about the natural disasters.
- To identify and correlate the role of National and International organizations in the management of environment.

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	2	2	2	1	2	-	-	-
CO2	2	2	2	-	2	-	-	-
CO3	-	1	1	-	1	-	-	-
CO4	-	-	-	-	-	3	-	3

Course Title: Dissertation

Course Code: MED 299

Credits: 4

Course Objectives: The research scholars will be required to write the chapters of their dissertation in this semester with the required rigor. This semester shall thus be the culmination of the work undertaken in the previous semesters.

Course Outcomes:

- To develop skills to find an appropriate problem
- To formulate solution of the appropriate problem through systematic investigation.
- To familiarize with research methods in education
- To develop an in-depth understanding of steps in conducting educational research

POs/COs	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO1	-	2	2	3	1	-	-	-
CO2	1	1	3	3	-	3	-	-
CO3	-	1	2	3	-	1	-	-
CO4	-	2	3	3	-	2	-	1



**LINGAYA'S
VIDYAPEETH**
choose to know

(u/s 3 of UGC Act 1956)

(A Deemed to be

University u/s 3 of

UGC Act, 1956)

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(NAAC Accredited)

M.A. ENGLISH

(2-Year Full-time Program)

SCHEME OF STUDY AND SYLLABUS

CHOICE-BASED CREDIT SYSTEM

School of Social Sciences & Humanities

ACADEMIC YEAR 2021-22



VISION, MISSION and CORE Values of the Vidyaapeeth

www.lingayasvidyapeeth.edu.in

Vision

Traditionally believing that God is the Source of all Truth, Goodness and Beauty, Lingaya's Vidyapeeth, wishes to develop in students a wisdom that translates academic achievements into responsible citizenship, sincere professional service and a deep respect for life and beauty in God's Creation and Recreation.

Mission

1. To impart knowledge and skills in the field of Engineering/ Technology, Management, Education, Science & Arts and related areas
2. To dedicate itself for improvement of social and economic status and enhancement of the quality of life for all
3. To strive for maximizing human welfare through education
4. To produce effective knowledge workers, practitioners and educators who will be guided by vision, compassion, knowledge, discipline, discovery with deep respect for human values
5. To provide an individual engineering and other professional learning experience for each student
6. To develop critical thinking, analytical ability and creative skills
7. To supplement the curricula, teamwork, leadership, communication skills, project management, social concerns and ethics, and
8. To establish interaction with industries for Technology, Research & Development.

In line with above vision and mission statements, Lingaya's Vidyapeeth has the following special characteristics:

1. Lingaya's Vidyapeeth is an Institution for providing a student with opportunity for all round development and education with the aim of effective living as a good citizen.
2. It has special strength in the field of Engineering and Technology with emphasis on practice and problem-solving skills.

3. Its activities and course curriculum concentrate on design, self-learning and research, which are the unique features of the Vidyapeeth.
4. The primary value of knowledge and skill imparted by Lingaya's Vidyapeeth resides in its utility in creating an infrastructure for the physical welfare of the general public, in sustaining good health of individual and the community.
5. Lingaya's Vidyapeeth facilitates and promotes creativity and critical thinking capabilities in its students.
6. The education in Lingaya's Vidyapeeth enhances the inherent capacity of a student with honesty, courage and fairness.

Vision & Mission - Department of English

Vision: The Department of English aspires to be recognized as a department of global standing for holistic development of students in language & literary courses and research so that they become humane, ethical, professionally competent & future-ready.

Mission:

- To train students to achieve Linguistic & Communicative Competency in English for personal & professional growth.
- To develop and deliver courses and research programs that equip students with the requisite language, literary and life skills to meet contemporary needs and job situations.
- To offer opportunities to explore literature and language across cultures.
- To prepare students for life and to make every student humane and ethical.
- To cultivate intellectual curiosity, aesthetic sensibility, creativity and the desire for lifelong learning.
- To create a conducive culture so that faculty and students develop consideration for the environment and social issues.

Program Educational Objectives (PEOs)

- **PEO 1:** Explore avenues in various roles viz. Teacher, Trainer, Writer, Author, Translation Specialist, Content Writer, Editor, Professional Copy Writer, Education Policy etc.
- **PEO 2:** Pursue Higher Education in the similar field or allied subjects and work in universities either as Professors or Researchers.
- **PEO 3:** Start own initiative and communicate with others/customers effectively and develop the technical skills and ethical decisions appropriate for the holistic professional development in the field.
- **PEO 4:** Widen their perspective to face the literary and artistic challenges and incorporate ICT skills to clear competitive examinations like NET, SET, UPSC, etc.

Program Outcomes (POs)

- **PO 1:** Disciplinary knowledge: Capable of demonstrating comprehensive knowledge and in understanding Language and Literature Studies.
- **PO 2:** Reasoning: Ability to analyse, interpret and draw conclusions from evidence and experiences from an open-minded and reasoned perspective.
- **PO 3:** Problem solving: Capacity to extrapolate and apply their competencies to solve different kinds of non-familiar problems and apply one's learning to real life situations using curriculum content knowledge.
- **PO 4:** Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.
- **PO 5:** Research-related skills: Recognize cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyze, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an investigation
- **PO 6:** Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

- **PO 7:** Cooperation/Team work: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.
- **PO 8:** Communication Skills: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.
- **PO 9:** Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning and engage in continuous learning for professional growth and development.
- **PO 10:** Scientific Temper: To build essential skills of life including questioning, observing, testing, hypothesizing, analysing and communicating.
- **PO 11:** Effective Citizenship: Demonstrate empathetic social concern and engage in service learning and community engagement programmes for contributing towards achieving of local, regional and national goals.
- **PO 12:** Gender Sensitization and Social Commitment: To imbibe Gender sensitivity and the sense of social responsibility for self and community for the benefit of the society at large.

Program Specific Outcomes (PSOs)

- PSO 1. Familiarise with the writers of English literature across different ages and continents, their theories, perspectives, models and methods.
- PSO 2. The student will be well versed with the major literary trends and movements and schools of criticism.
- PSO 3. The student will be familiar with research practices in language and literature.
- PSO 4. Application of the knowledge of Literature, theories, research and skills in different fields of literary practice.

- PSO 5. Analyse creative literary form (poetry, prose, Drama, fiction and creative non-fiction) 6. Apply skills in using theoretical frame works on structures of language through a wide variety of literary works on different perspectives.
- PSO 6. Use different techniques to apply the concepts from literary theory and criticism in the analysis and interpretation of texts in Language and Literature.

SEMESTER - I

COURSE CODE	COURSE TITLE	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-101	From Chaucer to Jane Austen	CORE	4-1-0	5

Course Outcomes: On completion of the course, the students will be able to:

- ✚ CO1. Understand the social and political backdrop of each literary period.
- ✚ CO2. Critically analyse the texts prescribed.

SEMESTER – I

COURSE CODE	COURSE TITLE	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-103	Indian Writing in English	CORE	4-1-0	5

Course Outcomes: On completion of the course, the students will be able to:

- ✚ CO1: Demonstrate awareness of social, political, and cultural issues reflected in Indian writing in English, with reference to Indian social reformations, freedom struggle and women empowerment.
- ✚ CO2: Critically evaluate the artistic and innovative use of language employed by the writers to instil the values and develop human concern in students through exposure to literary texts

SEMESTER - I

COURSE	COURSE TITLE	COURSE-WISE	L-T-P	CREDITS
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CODE		CLASS		
MEN-105	History of Language and Linguistics	ELECTIVE	4-1-0	5

Course Outcomes: On completion of the course, the students will be able to:

- ✚ CO1. Identify the origin of language from its earliest times and how English evolved from the Indo-European family of languages
- ✚ CO2. Analyse how foreign elements such as Scandinavian, Latin, French, Indian, American etc. helps the growth of vocabulary and meaning of the English language.
- ✚ CO3. Analyse syntactic and semantic changes in grammar.

SEMESTER - I				
COURSE CODE	COURSE TITLE	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-107	English Drama	ELECTIVE	4-0-0	4

Course Outcomes: On completion of the course, the students will be able to:

- ✚ CO1: Relate the development of English drama and its various themes and forms of different ages and stages.
- ✚ CO2: Identify the insights, genres, conventions and experimentations associated with English Drama, and the knowledge of historical, socio-political, and religious trends in the plays.

SEMESTER - II				
COURSE CODE	COURSE TITLE	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-102	English Poetry	ELECTIVE	4-0-0	4

Course Outcomes: On completion of the course, the students will be able to:

- ✚ CO1: Analyse poetry as a literary art and its various elements of poetry, such as diction, tone, form, genre, imagery, figures of speech, symbolism, theme, etc.

- ✦ CO2: Identify a variety of forms and genres of poetry from diverse cultures and historic periods, such as sonnets, ballads, dramatic monologues, epic and pastoral, free verse, Elegy etc. They also recognize the rhythms, metrics and other musical aspects of poetry.

SEMESTER - II				
COURSE CODE	COURSE TITLE	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-104	American Literature	CORE	4-1-0	5

Course Outcomes: On completion of the course, the students will be able to:

- ✦ CO 1: Interpret the depth and diversity of American literature.
- ✦ CO 2: Analyse the historical, religious and philosophical contexts of the American spirit in literature
- ✦ CO 3: Evaluate the complexity of the origin and reception of American literature.

SEMESTER - II				
COURSE CODE	COURSE TITLE	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-106	Advanced Communication in English	ELECTIVE	1-0-0	1

Course Outcomes: On completion of the course, the students will be able to:

- ✦ CO1. Identify the basics of communication and practice them in academic, social and professional situations.
- ✦ CO2. Demonstrate listening strategies appropriate to various situations
- ✦ Develop written texts for a variety of literary and professional purposes.

SEMESTER - II				
COURSE CODE	COURSE TITLE	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-108	English Prose and Fiction	ELECTIVE	4-0-0	4

Course Outcomes: On completion of the course, the students will be able to:

- ✚ CO1. Identify the literary, cultural, historical, political influence of the texts prescribed
- ✚ CO2. Differentiate between different types of fiction
- ✚ CO3. Analyse the theme and setting of a fictional work

SEMESTER - III				
COURSE CODE	COURSE NAME	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-201	American Literature-II	CORE	4-1-0	5

Course Outcomes: On completion of the course, the students

- ✚ CO1. Identify key ideas, representative Afro-American authors and works, significant historical or cultural events, and characteristic perspectives or attitudes expressed in the literature of African Americans.
- ✚ CO2. Analyse literary works as expressions of individual or gender values within the social, political, cultural, or religious contexts.

SEMESTER - III				
COURSE CODE	COURSE NAME	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-203	Literary Criticism	ELECTIVE	4-1-0	5

Course Outcomes: On completion of the course, the students should be able to:

- ✚ CO1. Trace the historical development of criticism
- ✚ CO2. Interpret literary works in the light of various critical approaches

SEMESTER - III				
COURSE CODE	COURSE NAME	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-205	Commonwealth Literature	ELECTIVE	4-1-0	5

Course Outcomes: On completion of the course, the students should be able to:

- ✚ CO1. Analyse the global relevance, significance and resonance of Commonwealth Literature today.
- ✚ CO2. Evaluate the postcolonial aspects of the literary works from Commonwealth nations

SEMESTER - III				
COURSE CODE	COURSE NAME	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-207	Indian Writing in Translation	CORE	4-1-0	5

Course Outcomes: On completion of the course, the students should be able to:

- ✚ CO1: Analyse Indian regional and classical literary forms
- ✚ CO2: Develop a comparative perspective to study the texts prescribed

SEMESTER - IV				
COURSE CODE	COURSE NAME	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-202	English Novel	ELECTIVE	4-1-0	4

Course Outcomes: On completion of the course, the students should be able to

- ✚ CO1: Differentiate between the Genre of the Novel and its types viz. Allegorical, Gothic, Historical, Epistolary, Picaresque, and Psychological
- ✚ CO2: Critically evaluate the social, historical and political backgrounds of the world of the novelists through the elaborate and allegorical descriptions in the prescribed novels.

SEMESTER - IV				
COURSE CODE	COURSE NAME	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-204	English Language and Linguistics	ELECTIVE	4-1-0	5

Course Outcomes: On completion of the course, the students should be able to

- ✚ CO1: Analyse the major areas of language use and development
- ✚ CO2: Develop linguistic analysis within the dominant cultural discourses
- ✚ CO3: Distinguish structures and features typical of a variety of written text-types

SEMESTER - IV				
COURSE CODE	COURSE NAME	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-206	Modern British Literature	CORE	4-1-0	5

Course Outcomes: On completion of the course, the students should be able to

- ✚ CO1: Identify the themes and poetic devices of British literature.
- ✚ CO2: Analyse the structure of the poetry.
- ✚ CO3: Evaluate fiction and prose works of British literature.

SEMESTER - IV				
COURSE CODE	COURSE NAME	COURSE-WISE CLASS	L-T-P	CREDITS
MEN-208	Literary Theory	CORE	4-1-0	5

Course Outcomes: On completion of the course, the students should be able to:

- ✚ CO1: Develop an aptitude for critical analysis of literary works
- ✚ CO2: Interpret literary works in the light of various critical approaches
- ✚ CO3: Compare and contrast major trends within literary theory of the 20th century.

Bachelor of Arts in English

B.A. (Hons.) English - 3-Year Full-time Program

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- PEO-1: Graduates will demonstrate comprehensive knowledge of literature in their chosen domain. They will describe a range of literary techniques and rhetorical strategies used in texts, including their relationship to audience, purpose and cultural context.
- PEO-2: Graduates will showcase leadership qualities and diverse learning by cultivating versatile skills of teamwork, morality, ethics, communication and analytical skills.
- PEO-3: Graduates will be competent to work in schools, colleges as teachers and widen their perspective in the related field by clearing competitive examinations like NET, SET, UPSC, etc.
- PEO-4: Graduates will be empowered to grab various employment opportunities in the fields of teaching, translation, content writing, and to pursue research and higher studies in similar field or allied areas.

PROGRAM OUTCOMES (POs):

- PO1. Critical Thinking: Students will be able to critically involve themselves with literary texts by processing information and identifying Patterns.
- PO2. Effective Communication: Study basic English Grammar and composition for developing communication skills. To build the capacity of expressing critical ideas in speech and writing.
- PO3. Social Interaction: The students will interact effectively with peers, faculty and management and effectively develop themselves in holistic cognizance of their surroundings and appreciate aesthetics in everyday life.
- PO4. Ethics: The students will be able to discern the moral conundrums that are

present in everyday life and be able to identify the right path based on the value system inculcated in them by the institution

- PO5. Interface of Literature with Life and Holistic Human Development: Impart holistic education through literature to help them develop competencies in practical conducts of life.

- PO6. Self-directed and Lifelong Learning: The course will inspire students to constantly upgrade their knowledge and skills.

PROGRAM SPECIFIC OUTCOMES (PSOs):

- PSO 1: Students will be able to demonstrate literary acumen in English Literature as a whole and will be able to judge literary quality of any literary text and to find connections & continuities along with incongruities of the past and present.

- PSO 2: Demonstrate proficiency in English language for effective communication to improve employability

- PSO 3: Imbibe moral and human values through study of English language and literature.

- PSO 4: Recognize the significance of social and professional responsibilities as citizens with integrity

- PSO 5: Cultural Integration: Students will be aware of the importance of the coexistence of different cultural perspectives and be tolerant to views different from their own.

- PSO 6: Academic Writing: Skills of interpretation, analysis, appreciation of literature as well as writing and presentation skills that would eventually help in careers like journalism and media, publishing, research and teaching will be inculcated in the students.

SEMESTER I

BEN-101 English Communication Skills

Course Outcomes: At the end of the course, students should be able to:

CO1: Identify parts of speech, verb forms and tenses

CO2: Demonstrate oral communication skills

CO3: Justify various genres of writing

CO4: Classify literary devices in examining prose and poetry

CO5: Evaluate professional skills using ethical communication and language

BEN-102 History of English Literature: An Introduction

Course Outcomes - At the end of the course, students should be able to:

CO1: Identify literary texts of different periods

CO2: Evaluate representative literary works written in different ages.

CO3: Analyse the complex relationship between literature and society.

CO4: Perceive the complex relationship between literature and society.

CO5: Critically appreciate representative literary works written in different ages.

BEN-103 British Poetry and Drama: 14th to 17th Century

Course Outcomes - At the end of the course, students should be able to:

CO1: Describe the social, political, religious and economic conditions of the respective ages in England, significant movements, influence and literary schools.

CO2: Determine the tenets of Renaissance Humanism

CO3: Justify aspects of the Elizabethan stage, Court and City

CO4: Evaluate how Religious and Political Thought of the period affected its literary output.

CO5: Analyse Ideas of Love and Marriage and their impact on the writer in Society – and the milieu.

BEN-104 Modern Indian Writings in English Translations

Course Outcomes - At the end of the course, students should be able to:

CO1: Identify the notion of Indian English – its emergence and characteristics

CO2: Elaborate an understanding of the scope of Indian writing in English with regard to poetry and prose.

CO3: Develop critical insight into Indian poetry in English with regard to poetry and prose

CO4: Evaluate the historical and cultural context of the texts prescribed.

CO5: Critically analyze the modern elements of drama

CEA-101 Environmental Science & Ecology

Course Outcomes - At the end of the course, students should be able to:

CO1: Understand fundamental terms related to the environment and aware of environmental Problems

CO2: Analyse the complexities of environmental problems and should know remedies available to them and implement them at their own level;

CO3: Move forward in their professional life with an environment-conscious mind and preserve our environment as much as they can.

BEN-151 English Communication Lab-1

Course Outcomes: At the end of the course, students should be able to:

CO1: Determine skills & approaches toward listening

CO2: Explain articulatory & presentation skills needed to participate in oral presentations in various professional settings.

CO3: Apply reading skills using reading comprehension techniques.

CO4: Analyze critical thinking ability through writing.

CO5: Disagree, argue, and use persuasive speech in an appropriate language.

PD-191A Hobby Club

Course Outcomes: At the end of the course, students should be able to:

CO: Empower the students with entrepreneurial skills, behaviour, grooming and effective interaction at the workplace

SEMESTER II

BEN-111 Indian Writing in English- An Overview

Course Outcomes - At the end of the course, students should be able to:

CO1: Discuss the characteristics of major periods of Indian Writing in English

CO2: Analyse the elements of poetry, novel and drama with respect to their sociopolitical background.

CO3: Evaluate the universal themes and human conditions with reference to texts prescribed.

CO4: Explore a great array of literary themes and styles.

CO5: Familiarize themselves with some of the fundamental methods involved in reading Indian texts in English, which will enable them to analyse the texts they value most and share them with the world

BEN-112 Popular Literature

Course Outcomes - At the end of the course, students should be able to:

CO1: Explain the early history of print culture in England and the emergence of genre fiction

CO 2: Demonstrate awareness of popular culture in its different manifestations as part of creative/cultural identity

CO3: Distinguish between high and low culture, canonical and non-canonical literature.

CO 4: Analyze the characteristics of various genres of non-literary fiction

CO 5: Critically evaluate the prescribed texts

BEN-113 Media & Communication Skills

Course Outcomes - At the end of the course, students should be able to:

CO1: Relate the importance of good writing in the field of Mass Media - from print to Digital Media

CO2: Understand the theoretical perspective behind mass media and the jargon associated with the field

CO3: Interpret theoretical perspectives behind mass media and the jargon associated with the field.

CO4: Develop writing skills required for various media - from journalism in print and broadcast media to advertising and creative commercial media

CO5: Master writing skills required for various media – from Journalism in Print and broadcast media to advertising and creative commercial media

BEN-114 English Communication Skills - II

Course Outcomes - At the end of the course, students should be able to:

CO1: Demonstrate their familiarity with theories of communication and their types.

CO2: Develop effective communication.

CO3: Analyse the skills of listening, speaking, reading and writing for language development.

CO4: Create summaries, paraphrase, summarize and interpret given texts.

CO5: Write letters, Reports and make notes.

BEN-111B Seminar - I

Course Outcomes - At the end of the course, students should be able to:

CO1: Demonstrate thorough knowledge of Indian Writing based on prescribed text(s)

CO2: Make an effective presentation based on analysis & research

BEN-112B Seminar - II

Course Outcomes - At the end of the course, students should be able to

CO1: Demonstrate thorough knowledge of Indian Writing based on prescribed text(s)

CO2: Make an effective presentation based on analysis & research

BEN-113A Media & Communication Skills Lab

Course Outcomes - At the end of the course, students should be able to:

CO1: Demonstrate ability to make presentations orally with the help of PowerPoint

CO2: Develop familiarity with activities like collage making, preparing advertisements, dialogue writing, and hosting talk shows.

SEMESTER III

BEN-201 Soft Skills

Course Outcomes - At the end of the course, students should be able to:

CO1: Determine interpersonal skills and be an effective goal-oriented team player

CO2: Elaborate creativity and lateral thinking.

CO3: Examine attitude and understand its influence on behaviour.

CO4: Justify resolving conflicts.

CO5: Evaluate management, and decision-making skills.

BEN- 202 American Literature

Course Outcomes - At the end of the course, students should be able to

CO1: Identify the history and culture of America with the help of prescribed text and select readings.

CO2: Determine the different genres and the contribution of the writers prescribed for the study

CO3: Explain the American concept of freedom, liberty, and life.

CO4: Analyze the concept, development, and degeneration of the American Dream

CO5: Evaluate the major conventions, tropes, and themes of Puritan and early American literature; identify and discuss those features with regard to individual works.

BEN- 205 Academic Writing and Composition

Course Outcomes: At the end of the course, students should be able to:

CO1: Demonstrate an understanding of literary conventions of academic writing.

CO2.: Develop a basic understanding of critical thinking.

CO 3. Analyse arguments, summarize, and paraphrase.

CO4: Evaluate critical thinking skills

CO5: Structure and edit arguments, book and media reviews

BEN- 206 British Poetry & Drama: 17th to 18th Century

Course Outcomes - At the end of the course, students should be able to:

CO 1: Demonstrate in-depth knowledge and understanding of the religious, socio-intellectual, and cultural thoughts of the 17th and 18th centuries

CO 2: Examine key themes in representative texts of the period,

CO 3: Justify texts in terms of plot construction, socio-cultural contexts, and genre of poetry and drama

CO4: Analyze the literary, cultural, historical, and political themes of the text.

CO5: Critically evaluate the backdrop of the age as well as the themes of the text

BEN-202B Seminar on American Literature

Course Outcomes - At the end of the course, students should be able to:

CO1: Exhibit knowledge of American literature, its central themes, literary periods, and key artistic features.

CO2: Make an effective presentation on related areas

BEN-251 Soft Skills Lab

Course Outcomes - At the end of the course, students should be able to:

CO1: Develop formal communication skills in the workplace.

CO2: Acquire team skills by working in group activities.

CO3: Use suitable language and speech patterns in the workplace.

CO4: Enhance the ability of critical & lateral thinking while addressing the issues in any situation.

CO5: Present themselves confidently in job interviews.

PD-293 Intra and Interpersonal Skills

Course Outcomes - At the end of the course, students should be able to:

CO1: To adequate communication skills.

CO2: To imbibe leadership skills

CO3: To prepare students for interviews

SEMESTER IV

BEN-211 Presentation Skills

Course Outcomes - At the end of the course, students should be able to:

CO1: Identify the various theories of communication.

CO2: Demonstrate an understanding of meaningful communication and conversations including GD, Interview skills etc.

CO3: Discuss the different stages of planning, preparation, delivery and feedback on effective presentations.

CO4: Develop Telephone Etiquettes.

CO5: Design computer-aided presentations.

BEN-212 European Classical Literature-An Overview

Course Outcomes - At the end of the course, students should be able to

CO1: Interpret the major genres- epic, tragedy and comedy, the structure, and the themes of the classical literary traditions.

CO2: Elaborate socio-historical context of some of those texts and form.

CO3: Evaluate the theory of Oedipus, Oedipus's complex and psychoanalytical understanding of Sigmund Freud's concept of interpretation of dreams.

CO4: Examine the concept of hell and its implications in the prescribed texts.

CO5: Critically analyse the themes of gender and politics as they unfold in the prescribed Texts.

BEN-213 British Literature 19th Century & Early 20th Century

Course Outcomes - At the end of the course, students should be able to:

CO1: Familiarize themselves with some of the seminal works on colonialism.

CO2: Acquaint themselves with the key concepts of postcolonial literary theory through the study of postcolonial texts.

CO3: Interpret the main developments in 19th and 20th-century British literature in relation to their historical and cultural contexts

CO4: Analyse the aspects of subjectivity, race, class, and feminism as they inherit in the postcolonial space.

CO5: Appreciate and evaluate the key debates in postcolonial theory

BEN-214 Literary Criticism – An Introduction

Course Outcomes - At the end of the course, students should be able to:

CO1: Recognize and define major critical schools.

CO2: Examine the theories of Rasa, Vyanjana and Alankara

CO3: Evaluate the different movements in Criticism

CO4: Examine critical terms and concepts

CO5: Critically analyse the prescribed texts.

BEN-215 Science Fiction and Detective Literature

Course Outcomes - At the end of the course, students should be able to:

CO1: Determine the categories of literature termed 'Science fiction' and 'detective literature'

CO2: Explain the accompanying social and philosophical issues associated with the prescribed texts

CO3: Justify the intricacies of the plot as aligned with detective fiction

CO4: Analyse the meaning of hitherto naturalized terms such as ‘crime’ and ‘human/humanity’.

CO5: Interpret the idea of ‘progress’ and the role of science and technology in human life.

BEN-252 Presentation Skills Lab

Course Outcomes - At the end of the course, students should be able to:

CO1: Demonstrate adequate reading, writing and verbal skills.

CO2: Demonstrate ability to show familiarity with Newspapers and Advertisements

PD-292 Effective Communication

Course Outcomes - At the end of the course, students should be able to:

CO1: Demonstrate effective communication and leadership skills.

CO2: Interact skilfully and ethically.

SEMESTER V

BEN-301 Applied Language Skills

Course Outcomes - At the end of the course, students should be able to:

CO1: Identify the different theories of communication

CO2: Distinguish between team building and teamwork.

CO3: Develop skills of emotional intelligence

CO4: Evaluate professional skills and body language

CO5: Analyse reality Vs fake

BEN-302 Postcolonial Literature

Course Outcomes – At the end of the course, students should be able to:

CO1: Evaluate the themes and features of Postcolonialism and Imperialism

CO2: Describe the impact of colonisation on different cultures, examine magic realism as a postcolonial tool

CO3: Evaluate gender and how it complicates and informs postcolonialism

CO4: Critically examine the political backdrop of Partition, discuss how the characters interact with each other, use of magic realism by Rushdie

CO5: Analyse the implications of colonialism in Nigeria, the role of motherhood and gender

BEN-303 Language, Literature & Culture

Course Outcomes – At the end of the course, students should be able to:

CO1: Identify language structure apropos language, identity and gender.

CO2: Discuss the link between language and culture.

CO3: Analyse factors contributing to language change

CO4: Develop knowledge of the cultural roots and heritage of the rich and diverse literature of India.

CO5: Evaluate the effect of globalization on language and culture

BEN-304 Literary Theory

Course Outcomes - At the end of the course, students should be able to:

CO1: Identify the political and contextual development of Marxism.

CO2: Explain the development of feminism as a political movement as well as the various theories that emerged from it.

CO3: Interpret the politics of power in the prescribed essay

CO4: Examine the mainstream literary theories in the light of the critics prescribed

CO5: Analyse the issues raised by Queer theory and its relevance in the contemporary Scenario.

BEN-305 Indian Classical Literature

Course Outcomes - At the end of the course, students should be able to:

CO1: Identify the theories of Indian classical literature

CO2: Explain the socio-political backdrop and themes of the prescribed texts

CO3: Evaluate classical Indian critical thought through literature

CO4: Examine gender and politics as it plays out in the prescribed text

CO5: Analyze the themes of heroism, devotion and gender

BEN-351 Applied Language Skills Lab

Course Outcomes - At the end of the course, students should be able to:

CO1: Engage in discussions and demonstrate effective skills to argue logically through various activities.

CO2: Communicate effectively

SEMESTER VI

BEN-307 Literature of the Indian Diaspora

Course Outcomes: At the end of the course, students should be able to:

CO1: Identify the intrinsic connection between literature and diaspora

CO2: Develop an appreciation of the global intersectional ties stemming out of increased migration and cross-cultural living culminating in diasporic practices

CO3: Examine the writings of diverse authors representing the world's major diasporic communities.

CO4: Evaluate how gender impacts diaspora literature

CO5: Analyse the prescribed text emphasizing themes and characters.

BEN-308 Modern European Drama

Course Outcomes - At the end of the course, students should be able to:

CO1: Understand the socio-political changes and their impact on European Theatre.

CO2: Recognize the theme emerging in Drama after WW II

CO3: Examine the theories that emerged in post -World War literature

CO4: Analyse the development of ideas that led to the emergence of existentialism, Theatre of the Absurd and Epic theatre

CO5: Develop knowledge of literary terms and key concepts involved in reading and analysing modern drama.

BEN-309 British Literature Post World War II

Course Outcomes - At the end of the course, students should be able to:

CO1 Identify features of postmodernism in the prescribed texts.

CO2 Discuss the themes of the prescribed texts

CO3 Evaluate 20th -century British literature by looking at various issues raised

CO4 Analyze the themes of the prescribed texts in the light of post-war scenario

CO5 Evaluate the anger of the proletariat against aristocratic values mentioned in the prescribed text.

BEN-310 Women Writings

Course Outcomes - At the end of the course, students should be able to:

CO1: Demonstrate an understanding of the major themes in women's literary texts.

CO2: Examine history through women's voices and perspectives.

CO3: Interpret the meaning and significance of feminine voices and concerns in the prescribed texts

CO4: Develop the relationship between gender and writing in the history of English literature

CO5: Classify theoretical terminology of feminist criticism with an increased sensibility towards issues of women's literary and political marginalization, and their continual resistance to both.

BEN-311 Research Methodology

Course Outcomes - At the end of the course, students should be able to:

CO1: Understand some basic concepts of research and its methodologies

CO2: Identify appropriate research topics

CO3: Develop appropriate research problem and parameters

CO4: Build a project proposal (to undertake a project)

CO5: Organize and conduct research (advanced project) in a more appropriate manner

BEN-312 Functional English

Course Outcomes - At the end of the course, students should be able to:

CO1: Identify Resume building skills

CO2: Develop presentation skills.

CO3: Interpret communication through official channels, using Emails and making presentations

CO4: Discuss adequate reading and writing skills for effective business communication

CO5: Analyse uses of English in academic and non-academic situation in India

Master of Arts in English

M.A. English - 2-Year Full-time Program

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

1. Explore avenues in various roles viz. Teacher, Trainer, Writer, Author, Translation Specialist, Content Writer, Editor, Professional Copy Writer, Education Policy etc.
2. Pursue Higher Education in the similar field or allied subjects and work in universities either as Professors or Researchers.
3. Start own initiative and communicate with others/customers effectively and develop the technical skills and ethical decisions appropriate for the holistic professional development in the field.
4. Widen their perspective to face the literary and artistic challenges and incorporate ICT skills to clear competitive examinations like NET, SET, UPSC, etc.

PROGRAM OUTCOMES:

1. **PO-1:** Disciplinary knowledge: Capable of demonstrating comprehensive knowledge and in understanding Language and Literature Studies.
2. **PO-2:** Reasoning: Ability to analyse, interpret and draw conclusions from evidence and experiences from an open-minded and reasoned perspective.
3. **PO-3:** Problem solving: Capacity to extrapolate and apply their competencies to solve different kinds of non-familiar problems and apply one's learning to real life situations using curriculum content knowledge.
4. **PO-4:** Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.
5. **PO-5:** Research-related skills: Recognize cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyze, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an investigation
6. **PO-6:** Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
7. **PO-7:** Cooperation/Team work: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.
8. **PO-8:** Communication Skills: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen

carefully, read and write analytically, and present complex information in a clear and concise manner to different groups

9. **PO-9: Self-directed and Life-long Learning:** Acquire the ability to engage in independent and life-long learning and engage in continuous learning for professional growth and development.
10. **PO-10: Scientific Temper:** To build essential skills of life including questioning, observing, testing, hypothesizing, analysing and communicating.
11. **PO-11: Effective Citizenship:** Demonstrate empathetic social concern and engage in service learning and community engagement programmes for contributing towards achieving of local, regional and national goals.
12. **PO-12: Gender Sensitization and Social Commitment:** To imbibe Gender sensitivity and the sense of social responsibility for self and community for the benefit of the society at large.

PROGRAM SPECIFIC OUTCOMES

1. Familiarise with the writers of English literature across different ages and continents, their theories, perspectives, models and methods.
2. The student will be well versed with the major literary trends and movements and schools of criticism.
3. The student will be familiar with research practices in language and literature.
4. Application of the knowledge of Literature, theories, research and skills in different fields of literary practice.
5. Analyse creative literary form (poetry, prose, Drama, fiction and creative non-fiction)
6. Apply skills in using theoretical frame works on structures of language through a wide variety of literary works on different perspectives.
6. Use different techniques to apply the concepts from literary theory and criticism in the analysis and interpretation of texts in Language and Literature.



(u/s 3 of UGC Act 1956)

(A Deemed-to-be University u/s 3 of UGC Act, 1956)

Approved by MHRD/UGC/AICTE/PCI/BCI/COA/NCTE Government of
India (NAAC Accredited)

B.A. PSYCHOLOGY (Honours)

(3-Year Full-time Program)

CHOICE-BASED CREDIT SYSTEM

School of Humanities & Social Sciences

ACADEMIC YEAR 2021 onwards



www.lingayasvidyapeeth.edu.in

Program Outcomes (POs)

On Successful completion of B.A Psychology (Honors) the students will be able to:

PO1: Enumerate the basic concepts of human behaviour, thoughts, emotions and its effective regulation to ensure positive self-development.

PO2: Explain the various biological and philosophical underpinnings of behaviour shaping human experiences.

PO3: Classify the different methodological approaches to validate psychological understanding including relevant statistical tools, observation, interviewing, self-report measures and experimentation.

PO4: Internalize the psychological understanding of individuals which will lead them to deal effectively with self-care and well-being of others.

PO5: Perform professionally as a psychologist in numerous fields with lifelong learning by adhering to ethical standards.

PO6: Examine the various environmental challenges confronting our planet and ways to ensure sustainable development.

PO7: Demonstrate effective communication skills to facilitate quality exchange of ideas, thoughts, opinions and knowledge.

PO8: Exhibit essential skills to collaborate with the community, innovate and become effective leaders of the future.

PO9: Create digital content keeping in mind career avenues related to professional writing, translation, mass media, journalism, and personality development.

PO10: Exhibit the ability to read and understand concepts related to feminism and gender at large including ethical debates on the subject.

Program Specific Outcomes (PSOs)

PSO1: Comprehend the field of academic inquiry in psychology, its major subfields of study and its relationship with key social and biological disciplines.

PSO2: Analyze the various schools of thought to nurture intrapersonal and interpersonal relationships to foster good mental health.

PSO3: Apply psychological skills and techniques to facilitate people with psychological problems.

PSO4: Inculcate the ability to understand the use of various statistical techniques and administer relevant psychometric test.

COURSE TITLE: INTRODUCTION TO PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Identify perspectives of psychology, its methods and branches.

CO2: Distinguish between attention and perceptual processes, different perceptual processes and concepts of illusions.

CO3: Explain the behavioral and learning paradigm in psychology and different approaches of motivation.

CO4: Analyze the process, models of memory and the nature of forgetting.

COURSE TITLE: STATISTICAL METHOD FOR PSYCHOLOGICAL RESEARCH-I

Course Outcomes: At the end of the course the student will be able to:

CO1: Determine the use of statistical methods in psychological research and the techniques of descriptive statistics for quantitative research.

CO2: Explain the major aspects of central tendency in statistics which will also help further in psychological research.

CO3: Analyze the standard scores, percentile ranks and the normal curve and its properties.

CO4: Measure different types of correlation and significance of correlations.

COURSE TITLE: BIOPSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Describe the nature, scope, the ethical considerations and different branches of biopsychology.

CO2: Examine the basic structure of neurons, its parts, the electrical and chemical transmission of synapses.

CO3: Evaluate the nature of the neurotransmitters, psychological disorders applicable to the imbalances of the neurotransmitters and Neuroplasticity of Brain

CO4: Analyze the structure and functional classification of major glands in the neuroendocrine system.

COURSE TITLE: GENERAL PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Identify the nature, sub-fields and applications of psychology.

CO2: Explain individuals on the basis of different theories of personality relating to psychoanalysis, humanistic and different general and specific theories of intelligence.

CO3: Justify different types of developmental processes from infancy to old age in the context of cognitive aspect, stages of moral development and the psychosocial aspects.

CO4: Analyze the field of psychology and its applications on the broader sectors of work and health.

COURSE TITLE: ENGLISH & COMMUNICATION SKILLS

Course Outcomes: At the end of the course, students should be able to:

CO 1: Use applicative grammar for effective communication.

CO 2: Demonstrate oral communication skills for meaningful conversation, both personal & professional.

CO 3: Apply techniques for effective writing skills.

CO 4: Acquire better vocabulary for enhanced communication.

CO 5: Evaluate professional skills through the importance of ethics of non-verbal communication.

COURSE TITLE: PRACTICAL ON TRIAL AND ERROR

Course Outcomes: At the end of the course the student will be able to:

CO1: Perform skillfully experiments on trial & error.

CO2: Devise problem statement and hypothesis on learning.

CO3: Construct introspective report on one's trial & error experiment.

CO4: Analyse the result.

COURSE TITLE: PSYCHOLOGY OF INDIVIDUAL DIFFERENCES

Course Outcomes: At the end of the course the student will be able to:

CO1: Describe the nature of personality, relationship between cultures, gender and personality and perspectives on personality.

CO2: Distinguish between psychometric and cognitive approaches of intelligence, nature and nurture, relationship between intelligence and creativity.

CO3: Evaluate the nature and types of motivation, motivation in education sector, workplace and theories of Motivation.

CO4: Analyze the nature of emotions and different universal expressions of emotions.

COURSE TITLE: DEVELOPMENT OF PSYCHOLOGICAL

THOUGHT

Course Outcomes: At the end of the course the student will be able to:

CO1: Describe Indian and Western views in understanding human psyche.

CO2: Distinguish between different western views and debating principles of development of psychological thoughts.

CO3: Justify the major contributions and perspectives of Positivists in development of psychological thoughts.

CO4: Analyse the major contributions of different schools in the development of psychological thoughts and the theories and principles of psychology.

COURSE TITLE: FORENSIC PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Determine psychological aspects of forensic investigation.

CO2: Elaborate the theory of crime.

CO3: Evaluate profile of the offenders.

CO4: Analyze different correctional methods, prevention and corrective interventions.

COURSE TITLE: PSYCHOLOGICAL RESEARCH

Course Outcomes: At the end of the course the student will be able to:

CO1: Identify the basic features & terminology used in human research, goals of psychological research, quantitative and qualitative orientations towards research.

CO2: Elaborate on different sampling methods and relating its uses.

CO3: Evaluate different methods of data collection.

CO4: Analyze characteristics of a test, and applications of psychological testing.

COURSE TITLE: COGNITIVE PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Summarize the history of cognitive psychology, approaches, methods of cognitive psychology and modern theories of consciousness.

CO2: Explain various forms of attention and effect of practice on attention.

CO3: Evaluate the structure, properties of language and how it is related with cognition.

CO4: Analyze the various concepts related to Problem Solving and Decision Making

COURSE TITLE: STRESS MANAGEMENT

Course Outcomes: At the end of the course the student will be able to:

- CO1: Describe the nature and symptoms of stress.
- CO2: Determine different sources of stress.
- CO3: Justify the effects of stress on health and develop an understanding of eustress.
- CO4: Analyze different techniques to manage stress like yoga, meditation, relaxation and coping strategies.

COURSE TITLE: PSYCHOLOGY OF LANGUAGE

Course Outcomes: At the end of the course the student will be able to:

- CO1: Describe psycholinguistics, historical origins behaviourism influence of Noam Chomsky, Neurological mechanisms of language production and comprehension.
- CO2: Examine the evolution of language, characteristics of speech and models of speech perception.
- CO3: Evaluate variations due to socioeconomic status, gender differences in language behavior and linguistic system influence perception.
- CO4: Analyse the factors influencing language acquisition.

COURSE TITLE: YOUTH PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

- CO1: Describe the notion of youth, youth across cultures and formulation of youth identity in Indian context.
- CO2: Examine Youth development and Relationships.
- CO3: Justify issues & challenges faced by today's youth.
- CO4: Analyze Positive youth development and Building resources.

COURSE TITLE: ENVIRONMENTAL SCIENCE AND ECOLOGY

Course Outcomes: At the end of the course the student will be able to:

- CO1: Describe the notion of youth, youth across cultures and formulation of youth identity in Indian context.
- CO2: Examine Youth development and Relationships.
- CO3: Justify issues & challenges faced by today's youth.
- CO4: Analyze Positive youth development and Building resources.

COURSE TITLE; PRACTICAL ON VOCATIONAL INTEREST RECORD

Course Outcomes: At the end of the course the student will be able to:

- CO1: Perform vocational interest record.
- CO2: Devise problem statement and hypotheses.
- CO3: Score and assess as per the instructions in the manual.
- CO4: Analyze the result.

COURSE TITLE: SOCIAL PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

- CO1: Identify the scope, history of Social Psychology and its relationship with other disciplines.
- CO2: Examine the social world through cognitive and perceptual processes and the role of attitude in social behaviour.
- CO3: Evaluate social interaction and influences through the concepts of interpersonal attraction, helping behaviour and aggressive behaviours.
- CO4: Analyze the nature of a group and consequences of belonging to it.

COURSE TITLE: UNDERSTANDING PSYCHOLOGICAL DISORDERS

Course Outcomes: At the end of the course the student will be able to:

- CO1: Identify the difference between normality and abnormality, issues of diagnostic features, classification, assessments needed and nature of clinical assessment.
- CO2: Explain the clinical features and the causative factors of Neurotic Disorders.
- CO3: Evaluate the clinical picture of mood, eating and sexual disorder.
- CO4: Analyze the clinical picture of psychotic, personality and developmental disorders.

COURSE TITLE: EFFECTIVE DECISION MAKING

Course Outcomes: At the end of the course the student will be able to:

- CO1: Determine importance of good decision making and various strategies which will enable them to make good decisions in life.
- CO2: Explain decisions regarding career.
- CO3: Evaluate decision making in interpersonal context.
- CO4: Analyze various areas where decision making is important.

COURSE TITLE: CHILD PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

- CO1: Describe the concept of child development and various factors influencing child development.
- CO2: Determine various developmental tasks, delays and hazards of development.
- CO3: Explain various theories of development.
- CO4: Analyze the process and problems in Physical, Motor, Social and Emotional Development of a child, concept of personality development including gender roles and socio-cultural factors involved in personality development of child.

COURSE TITLE: ENVIRONMENTAL PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

- CO1: Identify the environmental consequences on the affective, behavioural and cognitive aspects.
- CO2: Explain the pro-environment behaviours and various human-environment transactions.
- CO3: Analyse the influence of climate change on psycho-social health, wellbeing and various environmental predictors of climate change.
- CO4: Evaluate the consequences of resource scarcity on well-being of individual and various interventions to resolve the adverse effects.

COURSE TITLE: EMOTIONAL INTELLIGENCE

Course Outcomes: At the end of the course the student will be able to:

- CO1: Identify emotional intelligence, models and various aspects of personality related to emotional intelligence.
- CO2: Explain emotions of one selves, others and universal emotional expressions.
- CO3: Evaluate the association between emotions, thought, behaviour and techniques to manage it.
- CO4: Analyze the applications of emotional intelligence in workplace, leadership roles, relationships and conflict management.

COURSE TITLE: PRACTICAL ON ATTENTION AND MEMORY

Course Outcomes: At the end of the course the student will be able to:

- CO1: Perform skillfully experiments on attention and memory.
- CO2: Devise problem statement and hypotheses on attention and memory.
- CO3: Construct introspective report on one's attention skills and memory.
- CO4: Score and assess attention and memory.

COURSE TITLE: APPLIED SOCIAL PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Identify the nature and methods of applied social psychology.

CO2: Determine intergroup relations, issues related to groups, environment and the legal system.

CO3: Evaluate discrimination and diversity on the basis of economic, cultural, religious and other aspects.

CO4: Analyze the intervention systems and its evaluation for effective programs.

COURSE TITLE: STATISTICAL METHODS FOR PSYCHOLOGICAL RESEARCH-II

Course Outcomes: At the end of the course the student will be able to:

CO1: Identify different sampling techniques, hypothesis testing and concepts related to computing t test.

CO2: Explain null and alternative hypothesis (two independent means and three or more group data) and concepts of confidence intervals.

CO3: Evaluate different statistical measures (ANOVA and F ratio) and its comparisons.

CO4: Analyze the use and applications of parametric and non-parametric tests.

COURSE TITLE: COUNSELLING PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Identify the nature, goals of counseling, professional ethics, and its status in India.

CO2: Explain the basic therapeutic process involved in counseling process.

CO3: Evaluate various techniques of counseling pertaining to different schools of Psychology along with due emphasis on Indian techniques.

CO4: Analyze the applications of counseling into the broader sectors like family therapy, career counseling, grief resolution, suicide and sexual abuse.

COURSE TITLE: ABNORMAL PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Identify the etiological understanding and therapeutic interventions for the various psychological disorders.

CO2: Explain how to deal with moderate to severe psychopathology.

CO3: Evaluate behavioral, cognitive explanations and interventions.

CO4: Analyze family therapy, group therapies and efforts towards integration of approaches.

COURSE TITLE: PSYCHOLOGY FOR HEALTH AND WELL-BEING

Course Outcomes: At the end of the course the student will be able to:

CO1: Describe the spectrum of health and illness for better health management.

CO2: Determine the different models of health and illness on the basis of medical, bio psychosocial, holistic health and the concept of wellbeing.

CO3: Explain stress, coping, its consequences on health and different management techniques.

CO4: Evaluate behaviours which will be productive for health like proper exercise, nutrition and illness management, human strengths & virtues.

COURSE TITLE: CONTEMPORARY INDIA: WOMEN AND EMPOWERMENT

Course Outcomes: At the end of the course the student will be able to:

CO1: Describe social construction of gender and patriarchy.

CO2: Interpret contemporary representations of women femininities, gender-parity and power.

CO3: Examine the historic role of women's movements in India.

CO4: Develop a nuanced understanding of how to perceive, read, understand, interpret and intervene ethically in debates on the subject.

CO5: Analyze the role of feminism and female voices in the prescribed texts.

COURSE TITLE: INTER GROUP RELATIONS

Course Outcomes: At the end of the course the student will be able to:

CO1: Identify the nature of intergroup relations and classical study of Robbers cave experiment.

CO2: Determine social categorization, conflict and negative outcomes of social categorization.

CO3: Explain cultural aspects of intergroup relations and case studies in the Indian context.

CO4: Analyze the strategies for resolving intergroup conflicts.

COURSE TITLE: ORGANIZATIONAL BEHAVIOUR

Course Outcomes: At the end of the course the student will be able to:

CO1: Summarize Industrial Psychology, its history and challenges.

CO2: Explain the conceptual, theoretical bases of employee's motivation and attitudes.

CO3: Evaluate the dynamics of organizational behavior and various

theories of leadership.

CO4: Analyze the contemporary issues to leadership, challenges and Indian perspective on leadership.

COURSE TITLE: EDUCATIONAL PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Identify the nature, scope, relevance of educational psychology and various theoretical perspectives.

CO2: Distinguish between cognitive styles and learning strategies in education with respect to human diversities.

CO3: Analyze issues related to classroom and teaching methodologies.

CO4: Evaluate exceptionality and special education, issues related to it and responsibilities of teachers towards such students.

COURSE TITLE: PRACTICAL ON INTELLIGENCE TEST

Course Outcomes: At the end of the course the student will be able to:

CO1: Develop awareness of one's intelligence and expressions of emotions

CO2: Devise problem statement and hypotheses on intelligence and emotions.

CO3: Construct introspective report on one's experience in conducting experiments on intelligence and emotions.

CO4: Analyze intelligence as percentile rank of self and other individuals.

COURSE TITLE: UNDERSTANDING AND DEALING WITH PSYCHOLOGICAL DISORDERS

Course Outcomes: At the end of the course the student will be able to:

CO1: Determine diagnosis with the help of DSM-V and ICD-11 criteria of mental disorders.

CO2: Assess the severity of the intellectual and behavioural issues of clients with the help of tests and interviews.

CO3: Evaluate projective techniques by presenting ambiguous stimuli and unburdening the unconscious conflicts within the client through Rorschach, TAT, CAT and few personality inventories.

CO4: Analyze psychotherapeutic modalities like psychoanalysis, cognitive behavioural therapies, affective therapies and systemic therapies according to client suitability.

COURSE TITLE: DEVELOPMENTAL PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

- CO1: Describe the characteristic features of lifespan development, different types of development, and theories of human development.
- CO2: Determine physical, motor development and attachment theories.
- CO3: Examine physical development during adolescence, sexual differences in males and females, and various forms of self and relationships.
- CO4: Evaluate physical, psychological and social changes during adulthood, middle age and old age.

COURSE TITLE: POSITIVE PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

- CO1: Determine positive psychology, its history, the nature and scope of positive psychology.
- CO2: Justify positive emotional well-being and how emotional intelligence influence positive emotions.
- CO3: Evaluate character strengths, virtues and resilience in the phase of challenge.
- CO4: Analyze happiness, forgiveness, gratitude, and the relationship of traits with happiness.

COURSE TITLE: LEADERSHIP

Course Outcomes: At the end of the course the student will be able to:

- CO1: Identify self-management and social awareness.
- CO2: Explain key human relations skills demanded at the workplace.
- CO3: Evaluate leadership Development, Problem Solving and Conflict Resolution
- CO4: Analyze the concept of team building and group decision making.

COURSE TITLE: PSYCHOLOGY AND MENTAL HEALTH

Course Outcomes: At the end of the course the student will be able to:

- CO1: Describe the concept and importance of mental health, reducing the stigma of mental health, mental health issues in adolescence and young adults.
- CO2: Explain common mental health problems like anxiety, depression and managing treatment measures for suicide.
- CO3: Evaluate psychotic, neurotic and developmental disorders according to diagnostic criteria and features.

CO4: Analyze Interventions for mental health with the help of counselling, therapy, guidance and mentoring.

COURSE TITLE: GERONTOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Demonstrate knowledge of the major domains of geriatric development and the influence of social and cultural settings on it.

CO2: Explain the major contexts for geriatric development as well as be able to implement the learning in contextual settings.

CO3: Analyze Intergenerational Relationship and factors facilitate social support in old age.

CO4: Evaluate methodological strategies for assessing geriatric development and the programs that serve them.

COURSE TITLE: PRACTICAL ON PERSONALITY INVENTORY

Course Outcomes: At the end of the course the student will be able to:

CO1: Measure one's and others personality characteristics by conducting personality inventories.

CO2: Assess sentence completion test by drawing qualitative analyses.

CO3: Devise problem statement and hypotheses on personality inventories and the scores along with sentence completion test.

CO4: Construct introspective report on one's experience in conducting experiments by selecting subjects for personality and generating self-report for semi-projective techniques.

COURSE TITLE: PSYCHOLOGY OF DISABILITY

Course Outcomes: At the end of the course the student will be able to:

CO1: Describe disability from the psychological perspective.

CO2: Explain various theories of disability.

CO3: Evaluate social, cultural, historical and political phenomena associated with disability.

CO4: Design interventions to deal with disabilities.

COURSE TITLE: INDIAN PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Determine the important paradigms of Indian Psychology.

CO2: Assess the concept of consciousness and self in Indian Psychology.

CO3: Explain the different Godward emotions and the core psychological

concepts available in Indian Psychology.

CO4: Evaluate the application of Indian Psychological concepts of Yoga.

COURSE TITLE: CULTURAL PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Describe cultural processes and cultural differences.

CO2: Explain interconnectedness of culture, self and others. CO3:

Evaluate intercultural contacts.

CO4: Analyze the implication and application of Indian Psychology.

COURSE TITLE: COMMUNITY PSYCHOLOGY

Course Outcomes: At the end of the course the student will be able to:

CO1: Describe community psychology, types of communities, models and methods.

CO2: Examine an appreciation of the core values that guide community psychology and facilitate community functions.

CO3: Justify the link between individuals and communities and deal with social issues more effectively.

CO4: Design interventions with respect to health promotion programs in communities, community Programme for child and maternal health, for physically challenged and elderly people in the Indian context through case studies.

COURSE TITLE: TRAINING AND DEVELOPMENT

Course Outcomes: At the end of the course the student will be able to:

CO1: Describe the concept and practice of training.

CO2: Explain the tasks of training function.

CO3: Evaluate various training methods.

CO4: Analyze development in the modern organizational setting.

COURSE TITLE: WEB CONTENT WRITING

Course Outcomes: At the end of the course the student will be able to:

CO1: Explain the importance of content writing.

CO2: Examine the types of content writing skills, process and principles of writing.

CO3: Formulate an understanding of the audience.

CO4: Analyze blogging and SEO content.

COURSE TITLE: PSYCHOLOGY AND MEDIA

Course Outcomes: At the end of the course the student will be able to:

CO1: Relate the interface of media and psychology.

CO2: Develop an understanding of consumer psychology, its culture and identity.

CO3: Analyze consumer needs with the help of advertising.

CO4: Criticize the issues in media like discriminating the minorities, media violence, use and abuse of media.

COURSE TITLE: RESEARCH PUBLICATION AND PRESENTATION

Course Outcomes: At the end of the course the student will be able to:

CO1: Determine the role of ethics in research and learn best practices for conducting, presenting and publishing research.

CO2: Design behavioral research with the help of review of literature.

CO3: Plan manuscript with the inclusion of all the main and sub-chapters.

CO4: Prepare presentations of research findings in conferences/seminars and sharing views and interacting with fellow researchers.

COURSE TITLE: INTRODUCTION TO PROJECT WRITING

Course Outcomes: At the end of the course the student will be able to:

CO1: Construct a research problem based on the basic and applied orientation of research like abstract, introduction, and identifying the ethical guidelines.

CO2: Evaluate review of literature from past studies and recognize research gaps.

CO3: Design a research plan through systematic application of knowledge about appropriate sampling, suitable research designs, relevant research tools and standardized conduction.

CO4: Analyze the data through the use of quantitative or qualitative analysis.

COURSE TITLE: PRACTICAL ON PROJECTIVE TECHNIQUES

Course Outcomes: At the end of the course the student will be able to:

CO1: Assess qualitative reports of projective techniques like TAT/Rorschach by administering it on others.

CO2: Formulate hypothetical diagnosis by developing an understanding of case history. CO3:

Assess clinically one's cognitive functions by conducting MSE interview.

CO4: Create report by assessing one's severity and basic functional capabilities through case history and MSE.

SCHEME OF STUDIES



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SCHOOL OF LAW
B.B.A LL.B-5 Year Course Curriculum
(Batch 2021-2026)

I SEMESTER

Program Educational Objectives (PEO)

PEO 1: Students will be able to acquire basic knowledge and expertise necessary for law practices for higher studies and research

PEO 2: Students will be able to attain and practice technical skills to identify, analyze and solve complex problems and issues related to law and society.

PEO 3: Students will be able to possess a professional attitude as an individual or a team member with consideration for society, professional ethics, environmental factors and motivation for life-long learning

B.B.A. LL.B (5 years course)

PROGRAM OUTCOMES

Program Outcome 1

Students will demonstrate conceptual knowledge in core areas of law.

Program Outcome 2

Students will effectively apply their learnings to practical legal issues

Program Outcome 3

Students will be able to exhibit effective law professional skills, employing oral and written communication, legal research, analysis, rationalization and critical-thinking.

Program Outcome 4

Students will show sensitivity towards ethical, moral and social issues arising in their professional career.

Program Outcome 5

Students will exhibit commitment, teambuilding, networking, leadership and lifelong learning skills to excel in legal world.

PROGRAM SPECIFIC OUTCOMES:

PSO 1:Students will be able to demonstrate conceptual knowledge of law and develop legal reasoning.

PSO 2:Students will be able to demonstrate integrated knowledge of legal principles and social science.

PSO 3: Students will be able to exhibit skills in practices and procedures of law.

PSO4. Should have the capability to understand the laws at national and global level and to solve the client's problem.

PSO5. Should possess the skills to communicate in both oral and written forms and ability to formulate legal problems and using appropriate concepts and methods to solve them.

PSO6 should use skills in specific areas (e.g. Criminal, industrial-organizational, clinical, counselling, social, community).

PSO7 Should analyzing social problems and understanding social dynamics.

Mapping of Program Outcomes with Program Educational Objectives

	PEO1	PEO2	PEO3
PO1	3	3	3
PO2	2	2	2
PO3	3	3	2
PO4	3	3	3
PO5	2	2	2
PSO1	2	3	2
PSO2	3	3	3
PSO3	2	2	3

1=weakly mapped
2= moderately mapped
3=strongly mapped

Mapping of PEOs with Mission Statements

PEO Statements	School Mission 1	School Mission 2	School Mission 3	School Mission 4	School Mission 5	School Mission 6
PEO1:	3	3	3	3	3	3
PEO2:	3	2	2	2	2	3
PEO3:	3	3	2	2	2	2

Course Name: Law of Contract-I

Course Code: BL-101

Class: BBALLB 1st year

Semester: I

Credit: 4

Course Objective:

In every days transactions we made contracts, it is necessary to be conscious while in routine transaction that a particular transactions led to a contract or not. The objective of this paper is to make students familiar with various principles of contract formation enunciated in the Indian Contract Act, 1872.

Course Name: Law of Contract-I

Course Code – BL-101

On completion of this course, the students will be able to:

CO1: To make students understand basic concept of Contract, Agreement, Consideration etc.
CO2: To familiarize students with elements of free consent along with contingent contract.
CO3: To make students aware about the performance of the contract.
CO4: To develop the sense in the students about time and place of the performance of contracts.
CO5: To familiarize the students with certain relations resembling to contract and breach of the contract.

Course Name: General English

Course Code: HSS-103

Class: BALLB 1st year

Semester: I

Credit: 4

Objective

This course will focus on enhancement of student's thought, ideas and vision for practical application in their professional life. Combined with communication skills, the paper will help in developing critical and analytical skills among the students. Further business communication will make their professional communication effective.

Course Outcome

CO1: To introduce students to English legal resources in order to understand the legal language.

CO2: To enable the students to use legal vocabulary and terminology.

CO3: To enable successful and efficient communication (oral) appropriate to each situation.

CO4: To introduce students to various forms of legal writing appropriate to their specific needs.

CO5: To provide students with opportunities to develop basic English skills (written) in respect to topics dealt with in class.

Course Name: Legal Method & Legal Reasoning

Course Code: BL-103

Class: BALLB 1st year

Semester: I

Credit: 4

Course Objectives

The students will have an elementary understanding of the debates around the nature of law and will be able to distinguish between the major kinds of law, legal systems and institutions; know the structure of the legal institutions and the hierarchy of courts in India; acquire the ability to identify legal issues and principles underlying any given factual situation, and to undertake and present research on such issues; know the various sources of law and be able to synthesize such sources and use them to formulate arguments in their research.

Course Outcomes

At the end of this course, students should:

CO1 have an elementary understanding of the debates around the nature of law.

CO2 Be able to distinguish between the major kinds of law, legal systems and institutions.

CO3 Knows the structure of the legal institutions and the hierarchy of courts in India.

Course Name: Principles of Management

Course Code: MG-125

Class: BBALLB 1st year

Semester: I

Credit: 4

Objectives: The course aims at providing fundamental knowledge and exposure to the concepts, theories and practices in the field of management

Outcomes:

CO1: Understand the Management concepts and theories. .

CO2: Understand the leadership theories.

CO3: Examine various motivational techniques.

CO4: Understand leadership models by Talloo by Tata McGraw Hill

Course Name: Business Economics

Course Code: MG-105

Class: BBALLB 1st year

Semester: I

Credit: 4

Objective- The objective of this subject is to give understanding of the basic concepts and issues in business economics and their application in business decisions.

CO1: Understand the basic elements of managerial economics aspects, nature and decision Making.

CO2: Understand the law of demand, supply forecasting, consumer durable

CO3: Understand theories of profit, profit maximization and analysis of Break Even Point

CO4: Develop cost functions from production functions.

CO5: Develop and evaluate the impact of government regulations.

Course Name: Fundamentals of Moot Court

Course Code: BBALLB-151

Class: BBALLB 1st year

Semester: I

Credit: 1

CO1: Understand how to prepare a suit and how to file

CO2: Know the practical approach of the law course

CO3: Get the practical training to make the career bright

Course Name: Social awareness and legal awareness

Course Code: BL-153

Class: BBALLB 1st year

Semester: I

Credit: 1

Max Marks: 100

Practical subject

On completion of this course, the students will be able to

CO1.Learn about their rights and duties and basic features of the Indian constitution.

CO2.To create awareness about the various machineries/organs of the Justice delivery system available for redressal of their problems/grievances.

CO3.Learn about the procedure of approaching and utilizing various channels available for the 3 redressal of grievances i.e. the Police, the Executive and the Judiciary.

CO4.Discuss the basic concepts of labour law.

CO5. Learn the procedural guidelines mentioned under the criminal law system.

II Semester

Course Name: Law of Contract –II

Course Code: BL-102

Class: BBALLB 1st year

Semester: II

Credit: 4

Objective-

The objective of this paper will impart comprehensive information of Indemnity, Guarantee, Agency, Partnership, Sale of goods Act.

Course Outcome

On completion of this course, the students will be able:

CO1: To analyze the concept and nature of Indemnity and Guarantee.

CO2. To Differentiate between Pledge and Bailment.

CO3. To familiarize Kinds of Agency, Rights and duties of agent.

CO4. To analyze the concept of Contract of sale.

CO5. To analyze the Formation of Partnership, Rights and Duties of partners.

Course Name: Law of Tort and Consumer Protection Act

Course Code: BBALLB-104

Class: BBALLB 1st year

Semester: II

Credit: 4

Course Objectives:

To primarily concerned with redressal of wrongful civil action by awarding compensation. In a society where men live together, conflict interests are bound to occur and they may from time to time cause damage to one or the other. In addition with the rapid industrialization tortuous liability has come to be against manufacturers and industrial units. As the law of tort is a basically a judge made law, students are required to make a judicial pronouncements. They are required to keep themselves with the latest developments extending to the entire course.

Course Outcome :

On completion of this course, the students will be able to

CO1: Analyse the foundational principles of law of tort and consumer protection act.

CO2: To make students aware of relevant cases relating to tort law.

CO3: To familiarize the students difference between civil wrong and criminal wrong

CO4: Students will be aware of basic procedure for handling consumer dispute

CO5: Students will have comprehensive undertaking about existing law on consumer Protection in India.

Course Name: Financial Accounting

Course Code: MG-112

Class: BBALLB 1st year

Semester: II

Credit: 4

Course Outcome After completion of this course students will able to:

CO1 Ascertain the provisions of capital gains.

CO2 Articulate the basic concept related to income from other sources.

CO3 Familiars with the concept of clubbing of income.

Course Name: Business Organization and Management

Course Code: MG-110

Class: BBALLB 1st year

Semester: II

Credit: 4

Objective- To enable the students in terms of understanding the various concepts related to business organizations and administrative aspects

Outcomes -

CO1:Familiarize with global business environment.

CO2: Make them understand about different financial institutions.

CO3: Develop the knowledge about international business.

CO4: Know about international market.

Course Name: Moot Court-I

Course Code: BBALLB-154

Class: BBALLB 1st year

Semester: II

Credit:1

Objective- The objective of this subject is to teach students how to do legal research, present arguments and prepare memorial in a moot court along with basics professional ethics required in a court room.

Course Outcome

On completion of this course, the students will be able to

CO1.Learn about their rights and duties and basic features of the Indian constitution.

CO2.To create awareness about the various machineries/organs of the Justice delivery system available for redressal of their problems/grievances.

CO3.Learn about the procedure of approaching and utilizing various channels available for the 3 redressal of grievances i.e. the Police, the Executive and the Judiciary.

CO4.Discuss the basic concepts of labour law

Course Name: Legal English

Course Code: BL-114

Class: BBALLB 1st year

Semester: II

Credit: 4

Objective- This course will focus on enhancement of student's thought, ideas and vision for practical application in their professional life. Combined with communication skills, the paper will help in developing critical and analytical skills among the among the students. Further business communication will make their professional communication effective.

CO1: To introduce students to English legal resources in order to understand the legal language.

CO2: To enable the students to use legal vocabulary and terminology.

CO3: To enable successful and efficient communication (oral) appropriate to each situation.
CO4: To introduce students to various forms of legal writing appropriate to their specific needs.
CO5: To provide students with opportunities to develop basic English skills (written) in respect to topics dealt with in class.

Course Name: Social Awareness & Legal Awareness

Course Code: BBALLB-152

Class: BBALLB 1st year

Semester: II

Credit: 1

Objective-

This course is for the empowerment of individuals regarding issues involving the law. Legal awareness helps to promote consciousness of legal culture, participation in the formation of laws and the rule of law. This course aims to empower the youth of our country with the knowledge of their legal rights and duties, ultimately to be able to share power equally, gain full access to the means of development and to inspire a whole generation to work together towards achieving gender equality and justice.

Course Outcome

On completion of this course, the students will be able to

CO1.Learn about their rights and duties and basic features of the Indian constitution.

CO2.To create awareness about the various machineries/organs of the Justice delivery system available for redressal of their problems/grievances.

CO3.Learn about the procedure of approaching and utilizing various channels available for the redressal of grievances i.e. the Police, the Executive and the Judiciary.

CO4.Discuss the basic concepts of labour law.

III Semester

Course Name: Family Law -I

Course Code: BBALLB-201

Class: BALLB 2nd year

Semester: III

Credit: 4

Objective: Hindu law refers to the code of laws applied to Hindus, Buddhists, Janis and Sikhs. It also refers to the legal theory, jurisprudence and philosophical reflections on the nature of law discovered in ancient and medieval era. It gives us the base of the society i.e. family. It deals with different families' positions, traditions, rights and duties, family problems and legal solutions to them which directly relate to the society. The main objective of the subject is to resolve the socio-legal disputes arising in the society regarding marriage, divorce, property rights, partition, succession, maintenance, guardianship, adoption etc. It also sensitizes the students about Hindu society for their legal rights and duties :

Course Outcome

On completion of the course students will be able to :

CO1: Learn, appreciate and understand the sources and schools of Hindu Law.

CO2: Understand the basic concepts of Hind Law such as Hindu Joint family, Coparcener, Karta etc.

CO3: Understand the guiding principles of valid marriage and divorce followed under Hindu Law.

CO4: Gain knowledge of succession, partition, adoption, maintenance and guardianship.

CO5: Gain skills of thinking, analyzing, verbal and written presentation of ideas of argument.

CO6: Students will be able to put their acquired knowledge into practice in their research on contemporary constitutional law issues.

Course Name: Constitutional Law - I

Course Code: BALLB-203

Class: BALLB 2nd year

Semester: III

Credit: 4

COURSE OBJECTIVE:

1. Constitution of India is the pillar on which the governance of our country rests.
2. The course aims to examine the political, social and economic value structure of the Constitution of India.
3. The balancing of positive responsibility of the state to establish a economy of growth, social justice and political aspiration of all sections of the Indian society through Constitutional Governance.
4. The objective of this course is to make students understand the basic concepts of Indian constitution.

Course Outcome

On completion of the course students will be able to :

CO1: Learn, appreciate and understand the fundamental features of the Constitution.

CO2: Critically evaluate the role of fundamental rights and the correlation between fundamental rights and duties.

CO3: Understand the guiding principles of state policy in governance of the country.

CO4: Become a responsible citizen after being aware of their fundamental rights and duties

CO5: Understand the process of judicial review and how judiciary actively plays a role in protection of human rights.

Course Name: Law of Crime –I

Course Code: BL-205

Class: BBALLB 2nd year

Semester: III

Credit: 4

Course Objectives:

This paper will deal with the basic principles of criminal law determining criminal liability and punishments as well as Marital offences.

Course Outcome:

On completion of this course, the students will be able to

CO1: Identify ingredients of crime and basic Principles of Criminal Law.

CO2: learn how crimes are categorized by types and seriousness.

CO3: learn general exceptions mentioned under the IPC.

CO4: Analyze the different types of Punishments.

CO5: Identify types of marital offenses

Course Name: Marketing Management

Course Code: MG-207

Class: BALLB 2nd year

Semester: III

Credit: 4

Objectives: The objective of this paper is to identify the foundation terms and concepts that are commonly used in marketing. This course will give complete relationship between marketing and other management functions.

Course Outcome

CO1: Develop an idea about marketing and its functions.

CO2: Enhance the students on consumer behaviour.

CO3: Familiarize students about product and its classifications.

CO4: Understand the emerging issues in marketing

Course Name: Human Resource Management

Course Code: MG-211

Class: BALLB 2nd year

Semester: III

Credit: 4

Objectives: The objective of this course is to make students familiarize with basic concepts of human resource management and people related issues.

Course Outcome

CO1: Aiming to enable the students in Human Resources Management

CO2: Introduce the students about placement and training

CO3: Facilitate the knowledge about performance appraisal and different methods

CO4: Evaluate employee orientation, training, and development programs.

Course Name: Administrative law

Course Code: BBALLB-211

Class: BBALLB 2nd year

Semester: III

Credit: 4

Course Outcome

On completion of this course, the students will be able to:

CO1: Define the objectives of Administrative law and the rule of Law

CO2. Explain the nature, scope, necessity and development of Administrative Law and action.

CO3. Identify the basic rules and principles followed to render administrative justice;

CO4. Identify distinction between the Constitutional Law and Administrative Law

CO5. Examine the functioning of the special bodies constituted as alternative means for administering justice viz., Administrative Tribunals, Ombudsman, Lokayukta, Lokpal;

Course Name: Trial Advocacy

Course Code: BBALLB-251

Class: BBALLB 2nd year

Semester: III

Credit: 1

Practical Subject

Course Objectives: This Practical subject consists of the process of trial and how arguments are done in court, how examination cross examination and re-examination is done in a trial.

Course Outcomes

On completion of this course, the students will be able to

CO1: Understand & Conceptualize the evolution, meaning & scope of the legal systems.

CO2: Understand & Critically analyze the concept related to various sources of law.

CO3: Understand & Critically analyze the concept related with Socio-Economic Approach and philosophy.

CO4:Critically analyze& Evaluate the concepts related with legal aid & Lok Adalat.

CO5:Evaluate& Comparative Analysis of the multilateral aspects of the Legal system of India, U.K. & U.S.A.

IV SEMESTER

Course Name: Family Law - II

Course Code: BBALLB-202

Class: BBALLB 2nd year

Semester: IV

Credit: 4

Objective: To overview of Muslim law in its historical and evolution perspective. It includes a critical analysis of the history, development, and the schools of Muslim law, classical and modern theories, evolution of the law up to the present and its contemporary applications. It comprehensively covers the law of marriage, dissolution of marriages, guardianship, talaq, maintenance, paternity and the concept of legitimacy among Muslim and deals with debts and bequest (wasiyat), hiba (gift) and Muslim law of inheritance, the family courts, the civil Marriage Law, the Special Marriage Act etc. The main objective of the subject is to sensitize the students about the Islamic society, their legal rights and duties.

Course Outcome

CO1: To make students understand the scope, sources and schools of muslim law in India.

CO2: To familiarize students with muslim marriage, marital right and dower.

CO3: To analyze the concept of divorce and maintenance under muslim law.

CO4: To analyze the concept of gift, bequests, inheritance under muslim law

Course Name: Constitutional Law-II

Course Code: BBALLB-204

Class: BBALLB 2nd year

Semester: IV

Credit: 4

Objective-

1. This course introduce the students to a fundamental understanding of the term public law by contrasting with the realm of private law and the relationship between the two streams of law.

2. The study traces the evolution of the public law concept from the ancient times to the present and seeks to draw a distinction between the public law and private law

3. The purpose of this course is to equip the students with a broad spectrum of legal and judicial systems in the fast globalizing world

4. To give students brief knowledge about the various systems of governance and to draw a comparison between them.

5. The course intends to provide a comparative analysis about the structure of government, legislative process and the role of the judiciary to have better understanding of the Indian polity

Course Outcome

On completion of this course, the students will be able to

1. Understand the Principles, objects and forms of Governance
2. Understand the concept, evolution and objects of governance
3. Understand the system of Constitutional Governance
4. Understand the Rule of Law & its application in Indian Context
5. Understand various systems of Governance – Unitary, federal etc.
6. Understand the forms of Democracy – Presidential & Parliamentary

Course Name: Law of Crimes-II

Course Code: BL-206

Class: BALLB 2nd year

Semester: IV

Credit: 4

Objective- This paper will focus on the study of substantive crimes under the Indian Penal Code.

Course Outcome

Students will be able to:

CO1: understand the basic philosophy underlying the concept of crime, and categories of as well as parties to crime.

CO2: Analyze lacunas within the criminal justice system and suggest the amendments have to make to provide the justice according to the changing needs of the society.

CO3: Summarize the process of judicial review and identify criteria used by courts to evaluate the constitutionality of criminal law of India.

CO4: Understand and describe areas of criminal justice, law and society through a critical analysis of the subject

CO5: Problem-solve complex issues in the criminal justice system and society related to policy, law enforcement, vulnerability, and marginalization.

Course Name: Organizational Behaviour

Course Code: MG-202

Class: BBALLB 1st year

Semester: I

Credit: 4

Objectives: The course aims at providing fundamental knowledge and exposure to the concepts, theories and practices in the field of management.

Course Outcomes:

CO1: To develop creative and innovative ideas that could positively shape the organizations.

CO2: To accept and embrace in working with different people from different cultural and diverse background in the workplace.

Course Name: Strategic Management

Course Code: BBALLB-210

Class: BBALLB 2nd year

Semester: IV

Credit: 4

Objectives: The course aims to acquaint the students with the nature, scope and dimensions of Business Policy and Strategy Management Process.

Course Objectives :

CO1: Expose participants to various perspectives and concepts in the field of Strategic Management

CO2: Develop skills for applying these concepts to the solution of business problems.

CO3: Understand analytical tools of strategic management.

CO4: Understand SWOT analysis with industrial exposure

Course Name: International Law

Course Code: BBALLB-212

Class: BBALLB 2nd year

Semester: IV

Credit: 4

Course Objectives

To apprise the students about the similarities and difference between Municipal law and International Law, various sources, explanation of the term State including types of states, Recognition of State, Extradition, Asylum, Diplomatic agents, Amicable and Coercive modes of settlement of dispute, War, Blockade, Evolution of human rights and its National and international perspective.

Course Outcomes

On completion of this course, the students will be able to

CO1: Understand & Conceptualize the evolution, Sources & interconnection with domestic law related with International law.

CO2: Understand & Critically analyze the concept related with State Territory, State Jurisdiction, Recognition & Acquisition related with Public International Law.

CO3: Understand & Critically analyze the concept related with State Succession, Extradition, Asylum & Settlement of Disputes related with Public International Law.

CO4: Critically analyze & Evaluate applicability of various laws which falls under the purview of Public International Law.

CO5: Evaluate the multilateral aspects of human rights & related enactment under the purview of Public International Law

Course Name: Entrepreneurship

Development

Course Code: MG-204

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4	0		4

Class: BBALLB 2th year

Semester: IV

Credit: 4

Course Objectives: Students are given a project where they will learn entrepreneurship skills so that they can adopt these skills in their life.

V SEMESTER

Course Name: Banking and Insurance

Course Code: BL-301

Class: BBALLB 3rd year

Semester: V

Credit: 4

Objective: In this paper the students will be taught different kinds of banks, their functions, and relationship with customers and the banking frauds, law relating to recovery of debts due to banks recovery of debts. Kinds of insurance and the body regulating the insurance sector will also be studied, along with their judicial interpretation and the new and emerging dimensions in both insurance and banking.

COURSE OUTCOME:

At the end of the course, students should be able to:

C01 - To understand the working of the Reserve Bank of India and IRDA

C02 - To grasp the conduct of monetary policy and its effect on the interest rate, credit availability, prices, and the inflation rate

C03 -Discuss bank lending policies and procedures.

C04 -To elucidate the broad functions of banks and Insurance companies

C05 - Evaluate the performance of the banking industry and Insurance sector

Course Name: Law of Evidence

Course Code: BBALLB-303

Class: BBALLB 3rd year

Semester: V

Credit: 4

Course Objective:

The law of evidence is one of the most important branches of adjective law. Evidence is the pivot on which the whole edifice of administration of justice rests. It involves several questions, such as what is evidence, typology of evidence, how it is produced before a Judicial Authority and what is the role of the evidence in the administration of justice. The study of the law of evidence is most important in the field of legal education

- To acquaint the students with basic principles of the law of evidence;
- To enable them to understand the importance of evidence in the system of administration of justice.
- To enable them to analyze critically the rules of evidence and its application to a given fact situation.

Course Name: Corporate Law

Course Code: BBALLB-305

Class: BBALLB 3rd year

Semester: V

Credit: 4

COURSE OBJECTIVES:

To introduce Students to the economic function of the company as a legal structure for business, its advantages and disadvantages compared to other structure available such as partnership and the Limited Liability Partnership and in particular to the company's limited liability. To explain the legal nature and significance of limited liability and the price which those using a company as business structure are required to pay for it. To provide students with knowledge and appreciation of the major core topics in company law including the legal nature company as a business structure, the legal implications of separate corporate personality including limited liability, the validity of contracts made and the legal protection of shareholders. Moreover, the

legal basis of the control exercised by a company's board of directors and their legal duties as directors and the legal protection of shareholders. The effectiveness of these limitations and constraints in practice are also critical analysis room instructions to train the student.

On completion of this course, the students will be able to:

CO1: have an elementary understanding of various nuances of corporate law like corporate personality, doctrine of piercing the corporate veil etc.

CO2: Identify the relevant legal issues that arise on a given set of facts in the area of corporate law.

CO3: Explain and apply the principles of corporate law covered in the course

CO4: Analyze and predict how unresolved or ambiguous corporate law questions could be resolved by the courts through an analysis of case law and the judicial method.

Course Name: Civil Procedure Code, 1908 including Limitation act, 1963

Course Code: BBALLB-307

Class: BBALLB 3rd year

Semester: V

Credit: 4

Course Objective:

1. To provide adequate knowledge about procedures/rules of litigation in the civil courts. The students ought to be aware of the procedural aspects of the enforcement of civil rights in the Indian courts.
2. To give an overview of law of limitation for institution of suit, appeal, review, reference etc. since the law assists the vigilant and not those who sleep over the rights.
3. To view some of the current problems arising out of the procedural technicalities like delay in getting order, Judgment and decree in civil litigations. In some civil cases, even generations pass but no final decision comes out from the court, which is now a point of discussion in the society. To apprise the students with latest amendments in the Code of Civil Procedure is also one of the main objects.
4. To discuss about the nuances of the Civil Procedure and inculcate in them the basic traits of civil practice.

Course Outcome:

After the completion of the subject, the students would be able to:

C3004.1 Conceptualize the basics of procedural law of the civil litigation in India.

C3004.2 Familiarize with the different stages in a civil procedure to enable the students to practice in the civil courts.

C3004.3 Familiarize with certain important concepts and practical skill development activity will provide insights into the actual working of the court procedures.

C3004.4 Conceptualize the hierarchal setup of civil courts in India along with the different stages of a suit filing, drafting, hearing and execution proceedings.

C3004.5 Comprehend the importance of the law of limitation as the law supports only vigilant and not the dormant, who sleeps over his rights.

Course Name: Cost Accounting
Course Code: MG-305
Class: BALLB 2nd year
Semester: IV
Credit: 4

CO1: *To create knowledge in the field of cost accounting.*

CO1: To study about the various methods of costing that is used in business.

Course Name: Drafting, Pleading and Conveyancing
Course Code: BL-311
Class: BALLB 3rd year
Semester: V
Credit: 4

Course Outcome:

On completion of this course, the students will be able to:

CO1: To make students understand the general principle of drafting and pleading.

CO2: To familiarize students with civil appeal revision and writ petition.

CO3: To make students aware about the bail application criminal complaint and revision etc.

CO4: To develop the sense in the students about different types of deeds.

CO5: To familiarize the students with notice, licence and exchange deed.

VI SEMESTER

Course Name: Jurisprudence

Course Code: BBALLB-302

Class: BBALLB 3rd year

Semester: VI

Credit: 4

OBJECTIVE: To provide insight to the students about Sources of Law, Administration of Justice, Law and Morality, Schools of Jurisprudence, Legal Rights and Duties, Ownership and Possessions, Legal Personality, Obligation and Liability etc and to help in understanding the evolution and nature of Law and the fundamental functions of Law from different perspectives. Moreover, the students are also exposed to the information relating to functioning of various legal systems. This helps in making laws and tackling socio-legal problems prevalent in our country by studying the remedial measures in India.

Course Outcomes

On completion of this course, the students will be able to

CO1: Understand & Conceptualize the evolution, meaning & scope of the legal systems.

CO2: Understand & Critically analyze the concept related to various sources of law.

CO3: Understand & Critically analyze the concept related with Socio-Economic Approach and philosophy.

CO4: Critically analyze & Evaluate the concepts related with legal aid & Lok Adalat.

CO5: Evaluate & Comparative Analysis of the multilateral aspects of the Legal system of India, U.K. & U.S.A.

Course Name: Information Technology & Cyber Laws

Course Code: BL-304

Class: BBALLB 3rd year

Semester: VI

Credit: 4

Objective- To regulate framework for the control of Cyber crimes as they are in contact with the public at large and provide remedial measures for the public problems.

Both the personal and professional worlds are extremely dependent today on the Cyber World. The world is increasingly dependent on networked information and communication technologies (ICT). However, with growing dependency, new threats to network and information security have emerged and there is ever-growing vulnerability to Cyber Crime. This is also true for India where the number of internet users is growing rapidly and where ICT is of crucial importance for its economy. Thus, an effort to spread awareness of Cyber Security is the need of the hour and particularly among the law fraternity as these are the persons who must handle the cases of cybercrime. Lawyers, Police, Govt. Officers, Law students and the NGO's must know about the details of the Information Technology

Course Outcome

CO1: To make student aware the various kinds of cyber crime.

CO2: To familiarize students with intellectual property issues in cyber space and grow the development of law in this regard.

CO3: To analyze the various provision of Information technology act .

CO4: Student will able to gather knowledge about electronic contract.

CO5: To make student understand the cyber world and cyber law in general.

Course Name: Transfer of Property Act, 1872

Course Code: BBALLB-306

Class: BBALLB 3rd year

Semester: VI

Credit: 4

Objective: Property Law is one of the basic fundamental laws. It mainly deals with transfer of Immovable Property among the Living persons; the students are made aware regarding the basic principles of Transfer of Property as well as specific transfer like Election, Part Performance, Sale, Mortgage, Lease, Charge and Gift. This paper is very useful in practice for advocates since most of the common disputes are directly and indirectly associate with the Right to Property.

Course Outcome

On completion of the course students will be able to :

CO1: To make student understand scope of TPA and subject matter of transfer.

CO2: To familiarize students with rules against perpetuity, doctrine of election, apportionment.

CO3: To analyze the key provision of joint transfer, fraudulent transfer.

CO4: To analyze the conceptual framework related to marshalling and right and liabilities.

CO5: To make aware of charge, lease and Gift.

Course Name: Human Rights Law

Course Code: BL-308

Class: BALLB 3rd year

Semester: VI

Credit: 4

Objective- The understanding of human rights is the foundation for the development of a good citizen and a responsible legal professional. The main objective of this course is to provide an insight into the meaning and significance of various human rights in the contemporary era and the mechanisms developed at the international and national level for protection and promotion of such rights. This course attempts to increase the knowledge of law students with respect to human rights; to focus their attention on the underlying values of human rights and to explore various international and national legal frameworks which embody human rights and promote them in practice.

Course Outcome

On completion of the course students will be able to :

CO1: Understand the significance and basic concept of human rights,

CO2: Form linkage between human rights, fundamental rights and fundamental duties.

CO3: Learn different causes of human rights violation and how can justice be given to victims.

CO4: Learn about international treaties, conventions related to human rights.

CO5: Evaluate the relationship between international and municipal law on human rights.

CO6: Find the loopholes in human rights system and suggest changes.

Course Name: Code of Criminal Procedure

Course Code: BALLB-310

Class: BALLB 3rd year

Semester: VI

Credit: 4

Objective: Of all the branches of law, criminal law is the most important branch of law, because it closely touches and concerns man in his day-to-day affairs. The Criminal Procedure is an inseparable part of the penal law. Without the Criminal procedure code, the substantive criminal law will become worthless and meaningless. Our law of criminal procedure is mainly contained in the Code of Criminal Procedure 1973. It provides the machinery for the detection of crime, apprehension of suspected

criminals, collection of evidence, determination of the guilt or innocence of the suspected person and the imposition of suitable punishment on the guilty person. With this perspective this subject is designed to make the student understand how the Criminal Procedure Code controls and regulates the working of the machinery set up for the investigation and trial of offence

Course Outcome

CO1: To make students understand the constitution, power and function of the criminal courts in India and distinguish between cognizable, non-cognizable, bailable and non-bailable offence and power and functioning of the police

CO2: To make students understand with law related to maintenance, investigation by police and jurisdiction of courts

CO3: To familiarise students with composition, working and jurisdiction of the Lok Adalat.

CO4: To make students understand meaning, importance of Para Legal Services and its role in social transformation

CO5: To make student able to understand composition, functioning and power of National, State and District Legal Services Authority

Course Name: Environmental Laws

Course Code: BBALLB-312

Class: BBALLB 3rd year

Semester: VI

Credit: 4

Course Objectives

The paper seeks to inculcate a general awareness of the major problems of environmental protection in three categories: (1) Protection of the environment, (2) Pollution abatement, and (3) Protection of natural and living resources, and the major legal framework obtaining in the Indian law.

CO1: Understand & conceptualize the evolution, Sources & fundamentals related with Environmental law.

CO2: Understand & critically analyze the concept related with Pollution & its types, Statutes related with Air & Water for prevention & control of pollution and Coastal Zone Management.

CO3: Understand & critically analyze the laws related with forest management, Wildlife protection & Judicial Contribution with regards to wildlife protection.

CO4: Critically analyze & Evaluate contribution of domestic laws with regards to Land resources, Wetlands, Water resources & Ground water management.

Course Name: Internship-I

Course Code: BL-352

Class: BBALLB 3rd year

Semester: VI

Credit: 1

Course Objectives

Through internship a law student gains practical experience and contemporaneously inculcates work ethics by interning either under a lawyer or a law firm or a government body participating in legal sphere or a research organisation or any other legally-oriented institution. Prime objective is to prepare student to demonstrate desirable qualities & professional ethics to be employable in different fields related with legal profession.

VII SEMESTER

Course Name: Labour & Industrial Law - I

Course Code: BBALLB-401

Class: BBALLB 4th year

Semester: VII

Credit: 4

Course Objectives: To apprise the students with application of various laws for the raising of living standards of labourers and peaceful of resolution of Industrial Disputes. In this regard the functions of Labour Court, Tribunals, and Arbitration are discussed in detail. Strike, Lockout, Role of Trade Unions and the Factories Act etc. are explained in detail and easy manner.

Course Outcomes

On completion of this course, the students will be able to

CO1: Understanding of the principles of labour law to a level that is sufficient to satisfy the requirements for admission to legal practice.

CO2: Resolve legal issues relating to the Labour laws in terms of the Strike, Lockout, and other provision related to dispute between employee and employer.

CO3: Conceptualize and analyze the causes of developments the trade unionism in India and its causes. .

CO4: Assess and analyze the rights and liabilities of registered trade union along with its membership.

CO5: Conceptualize and identify different aspect of The Factory Act,1948.

Course Name: Taxation Laws

Course Code: BBALLB-403

Class: BBALLB 4th year

Semester: VII

Credit: 4

Course Objective :

1. Taxation is a general law made by governments to collect revenue from people and organizations.
2. A tax formula contains at least three elements: the definition of the base, the rate structure, and the identification of the legal taxpayer.
3. The base multiplied by the appropriate rate gives a product, called the tax liability, which is the legal obligation that the taxpayer must meet at specified dates.
4. A tax is identified by the characteristics of its base, such as income in the case of an income tax.
5. The paper is helpful to the students in understanding the theoretical as well as practical aspects of Taxation Policy of the Government.

Course Outcome

On completion of the course students will be able to :

CO1: To understand the basic concept of Income Tax

CO2: To understand the calculation of different head of Income.

CO3: To understanding the deduction, rectification and assessment procedure.

CO4: To analyse the appeal,references,revision,penalties and Liability in special cases

CO5: To analyse the rebate, Relief , double

Course Name: Public Interest Lawyering, Legal Aid & Para Legal Services

Course Code: BBALLB-405

Class: BBALLB 4th year

Semester: VII

Credit: 4

OBJECTIVE: This course will address the theory and practice of public interest work and help you to develop some of the writing and advocacy skills needed to conduct a public interest law practice. We will discuss various models of public interest lawyering and ethical issues confronting lawyers in this area. You will also have the opportunity to draft various documents essential to a public interest practice, both in a litigation (affidavit, motion) and a non-litigation (letter, press release, fundraising proposal) context. Some of the assignments will be done individually, and some with a partner, as working with others is a central part of "real world" lawyering.

Course Outcomes: - Students graduating with 'Professional Ethics, Bar Bench Relations & Accountancy for Lawyers' will be able to:

1. To understand and apply the professional ethics and ethical standard of the legal profession
2. To know and evaluate the key themes in professional ethics, in order to give them an insight into moral decision making in the legal profession.
3. To know, Should lawyers aim to win at all costs, and how should they balance duties to their client, to the Courts, to justice in the abstract, and to themselves?

Course Name: Investment Law and Competition Law

Course Code: BBALLB-407

Class: BBALLB 4th year

Semester: VII

Credit: 4

Objective: An investment objective is one of the few parameters that a financial advisor, asset management company, or robo-advisor require in order to determine the assets in the portfolio of their clients. An investment objective is the purpose of the client for which he or she decides to invest in a particular asset or security.

COURSE OUTCOME:

Upon successful completion of the course, students will:

CO1:Have knowledge and understanding of the conceptual basis of international investment law

CO2: Have an appreciation of how the main procedural and substantive principles of international investment law apply in practice

CO3:Be able to select and apply the international and domestic rules on the regulation of foreign direct investments

CO4:Analyze the complexity of problems and legitimacy issues related to legal regulation of foreign direct investments and the system of investor-state dispute settlement.

Course Name: Trust Equity & specific Relief act, 1963

Course Code: BBALLB-409

Class: BBALLB 4th year

Semester: VII

Credit: 4

Objective: Objective: The objective of the course is to provide students with an overall understanding of the law of equity with special emphasis on fiduciary obligations, trusts, equitable assignment of property and equitable remedies. The paper is useful for students to understand and compare the role of Equity in ancient and modern legal system.

COURSE OUTCOME:

At the end of the course, students should be able to:

C01 – identify and state a clear understanding of the law of trust, equity and fiduciary relationship and how it applies to whole of civil law in India.

C02 – identify the different types of principles of equity and equitable remedies.

C03 – distinguish between different types of trust and analyse the powers rights and duties of a trustee

C04 – critically analyse the theoretical and philosophical underpinnings of the law of equity and trust

C05 – critique the societal impact of the law of equity and trust

Course Name: Interpretation of Statutes

Course Code: BBALLB-411

Class: BBALLB 4th year

Semester: VII

Credit: 4

Objective : In the construction interpretation of statutes, the principle aim of the court must be to carry out the Intention of Legislature. A statute is presumed to make no changes in the common law. For the Law student it is very necessary to know the fundamentals of interpretation, therefore, they are taught different principles of interpretation used by courts to find out the real intention and object of legislation. It is very helpful in legal profession.

Course Outcome

On completion of the course students will be able to :

CO1: To make student understand the meaning, principles of interpretation.

CO2: To familiarize students with external aid, interpretation of penal and taxing statutes.

CO3: To analyze the key provision of rule of Ejusdem Generis and Noscitur-a-sociis.

CO4: To analyze the conceptual framework Rule of Pari Materia, and Stare Decisis.

CO5: To make aware of Legislation and Relationship between Law and Public Opinion.

Course Name: Internship-II

Course Code: BBALLB-451

Class: BBALLB 4th year

Semester: VII

Credit: 1

Course Objectives

Through internship a law student gains practical experience and contemporaneously inculcates work ethics by interning either under a lawyer or a law firm or a government body participating in legal sphere or a research organisation or any other legally-oriented institution. Prime objective is to prepare student to demonstrate desirable qualities & professional ethics to be employable in different fields related with legal profession.

VIII SEMESTER

Course Name: Intellectual Property Rights

Course Code: BBALLB-402

Class: BBALLB 4th year

Semester: VIII

Credit: 4

Objective: To create awareness about the concept of Intellectual Properties, various conventions, Provisions of Copy Right Act, 1957, The Trade Mark Act 1999 and The Patents Act 1970. The students can understand the process of Registration of Copyright work, trade mark and patents with the help of this paper.

Course Outcome

On completion of the course students will be able to :

- CO1: To make student understand scope of TPA and subject matter of transfer.
- CO2: To familiarize students with rules against perpetuity, doctrine of election, apportionment.
- CO3: To analyze the key provision of joint transfer, fraudulent transfer.
- CO4: To analyze the conceptual framework related to marshalling and right and liabilities.
- CO5: To make aware of charge, lease and Gift

Course Name: Labour Law-II

Course Code: BBALLB-404

Class: BBALLB 4th year

Semester: VIII

Credit: 4

Objective-

- 1.To know the development and the judicial setup of Labour Laws.
- 2.To learn the salient features of welfare and wage Legislations.
- 3.To learn the laws relating to Industrial Relations, Social Security and Working conditions.
- 4.To understand the laws related to working conditions in different settings.

Course Outcomes

On completion of this course, the students will be able to

CO1: Understanding of the principles of labour law to a level that is sufficient to satisfy the requirements for admission to legal practice.

CO2:Resolve legal issues relating to the Labour laws in terms of the Strike, Lockout, and other provision related to dispute between employee and employer.

CO3: Conceptualize and analyze the causes of developments the trade unionism in India and its causes. .

CO4: Assess and analyze the rights and liabilities of registered trade union along with its membership.

CO5: Conceptualize and identify different aspect of The Factory Act,1948.

Course Name: Socio Economic Offences

Course Code: BBALLB-406

Class: BBALLB 4th year

Semester: VIII

Credit: 4

Course Outcome

On completion of the course students will be able to :

CO1: To understand the evolution and extent of Socio Economic offences.

CO2: To understand the Protection of Women from Domestic Violence Act,2005

CO3: To discuss the Immoral Traffic (Prevention) Act,1956

CO4: To analyse the Prevention of Money Laundering Act,2002

CO5: To analyse the Prevention of Corruption Act, 1988.

Course Name: Arbitration Conciliation & Alternative Dispute Resolution System

Course Code: BBALLB-408

Class: BBALLB 4th year

Semester: VIII

Credit: 4

Objective- To find out the various Dispute Resolution Techniques used at International and National level. To trace out the differences between most prominent dispute resolution methods including traditional litigation, arbitration in many forms including International Commercial Arbitration mediation and conciliation etc. The system of ADR is less time consuming as well as informal. Therefore cost of litigation is also subsequently reduce. With the help of this paper, the students learn new techniques of resolution of disputes in certain cases.

Course Outcome

- CO1:** To make student understand the domestic and international commercial arbitration.
CO2: To familiarize students with difference between ADR and other dispute mechanism.
CO3: To analyze the key provision of Arbitration and conciliation Act 1996.
CO4: To analyze the conceptual framework related to various ADR process.
CO5: To make aware of various convention related to Arbitration dispute resolution.

Course Name: Law Relating to Right to Information and Media Law

Course Code: BBALLB-410

Class: BBALLB 4th year

Semester: VIII

Credit: 4

Course Objectives

The course aims to give knowledge about provisions of the Act - How Right to Information Law is bringing transparency and accountability in the working of the government and to study the role of judiciary on RTI and also about Media & Law.

Course Outcomes

On completion of this course, the students will be able to:

CO1: Understand & Conceptualize the evolution, meaning, scope & basics related with Right to Information & Free flow of Information.

CO2: Critically assess & analyze the provisions of “The Right to Information Act”.

CO3: Understand & critically analyze the involvement & contribution of the Judiciary with regards to right to information.

CO4: Critically analyze & evaluate the role media involving different aspects & rights to information.

CO5: Evaluate the multilateral aspects of the concepts related with right to information with media & constitutional framework related with them & evaluate the practical applicability of RTI Act.

Course Name: Internship-III

Course Code: BBALLB-452

Class: BBALLB 4th year

Semester: VIII

Credit: 4

Course objectives: Students will have to go through one month of mandatory internship and prepare a report on it.

IX SEMESTER

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SCHOOL OF LAW

B.B.A.L.L.B. 5 YEARS PROGRAMME

Subject : Goods and Services tax (GST)
Subject Code : BBALLB 501
Class : B.B.A LL.B. VYEAR
Semester : IX
Credit : 4

Objective: The Objective of the course is to acquaint the student about the introduction of GST in India and the replacement of all Indirect Taxes with GST to make India Level playing field with outside world.

On completion of this course, the students will be able to:

CO1: To enable the students to learn the concepts indirect tax and GST from the pre-GST period to post- GST period.

CO2: To understand the importance of indirect taxes (GST) in the Indian and global economy and its contribution to the economic development.

Course Name: Land Laws
Course Code: BBALLB-503
Class: BBALLB 5th year
Semester: IX
Credit: 4

COURSE OUTCOMES

On completion of this course, the students will be able to:

CO1: Understand and analyze legislative power to make laws relating to land and land ceiling is in the state list.

CO2: Understand & analyze different states enactment on tenancy & ceiling of Punjab & Haryana respectively.

CO3: Understand & critically analyze the regulation related to rent & other aspects of Haryana.

CO4: Critically analyze & evaluate the working & functions of panchayats with regards to land related matters.

CO5: Evaluate & Critical analysis the multilateral aspects of the panchayat samities & revenue sources.

Course Name: Gender Justice & Feminist Jurisprudence

Course Code: BBALLB-505

Class: BBALLB 5th year

Semester: IX

Credit: 4

Course outcome

CO1. The course offers to examine the potential of law for delivering gender justice, empowerment and equality.

CO2. Feminist jurisprudence is **a philosophy of law based on the political, economic, and social equality of sexes**

Course Name: International Trade Law

Course Code: BBALLB-507

Class: BBALLB 5th year

Semester: IX

Credit: 4

Course outcome

CO1. It focuses on analysing the gains from trade, the changing patterns of trade, the income distributional consequences of liberalising foreign trade, the relationship between trade, investment, and economic growth, and the reasons for and consequences of trade policies.

CO2. The course relies predominantly on a standard collection international trade models to understand the motivations behind modern trade policies.

CO3. During the weekly seminar, students then analyse the efficacy of trade policy, considering both intended and unintended consequences of policy choices with particular attention paid to the changing geopolitical environment in which these policies exist

Course Name: Summer Internship

Course Code: BBALLB-551

Class: BBALLB 5th year

Semester: IX

Credit: 4

Course objectives : Students will have to go through one month mandatory internship and prepare a report on the same.

XTH SEMESTER

Course Name: MOOT COURT-II

Course Code: BBALLB-554

Class: BBALLB 5th year

Semester: X

Credit: 4

MOOT COURT (PRACTICAL)

1. Constitutional matter
2. Criminal matters
3. Family matters & others civil matters
4. International law

Course Name: Comparative Public Law

Course Code: BBALLB-504

Class: BBALLB 5th year

Semester: X

Credit: 4

Course Outcomes

On completion of this course, the students would:

CO 1. Be able to understand the similarities and differences between leading legal traditions in key areas like separation of powers, protection of rights and the role of judiciary

CO2. Be familiar with the methodology of comparative public law

Course Name: Real estate Laws

Course Code: BBALLB-506

Class: BBALLB 5th year

Semester: X

Credit: 4

Course Outcomes:

CO1. *To analyse the basic principles of property law through jurisprudential theories.* CO2.
To explain about the basic principles and doctrines

Course Name: Legal Ethics

Course Code: BBALLB-508

Class: BBALLB 5th year

Semester: X

Credit: 4

Course Outcome: At the end of the course, a student will be able to understand:

CO: 1. To understand and apply the professional ethics and ethical standard of the legal profession.

CO: 2 To know and evaluate the key themes in professional ethics, in order to give them an insight into moral decision making in the legal profession

. CO: 3. To know , Should lawyers aim to win at all costs, and how should they balance duties to their client, to the Courts, to justice in the abstract, and to themselves.

Course Name: Internship-V

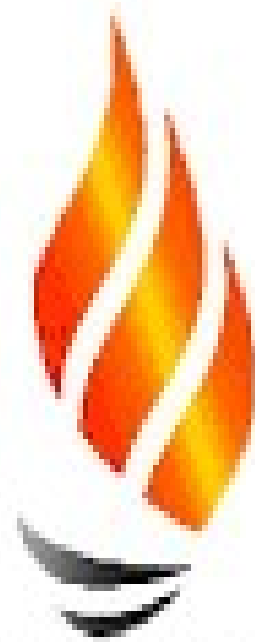
Course Code: BBALLB-552

Class: BBALLB 5th year

Semester: X

Credit: 4

Course objectives : Students will have to go through mandatory internship for one month and submit a report on the same.



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LL. B Course

Program Educational Objectives (PEO)

PEO 1: Students will be able to acquire the basic knowledge and expertise necessary for law practices for higher studies and research

PEO 2: Students will be able to attain and practice technical skills to identify, analyze, and solve complex problems and issues related to law and society.

PEO 3: Students will be able to possess a professional attitude as an individual or a team member with consideration for society, professional ethics, environmental factors, and motivation for life-long learning

LL. B (3 years course)

PROGRAM OUTCOMES

Program Outcome 1

Students will demonstrate conceptual knowledge in core areas of law.

Program Outcome 2

Students will effectively apply their learnings to practical legal issues

Program Outcome 3

Students will be able to exhibit effective law professional skills, employing oral and written communication, legal research, analysis, rationalization, and critical thinking.

Program Outcome 4

Students will show sensitivity towards ethical, moral, and social issues arising in their professional careers.

Program Outcome 5

Students will exhibit commitment, team building, networking, leadership, and lifelong learning skills to excel in the legal world.

PROGRAM SPECIFIC OUTCOMES:

PSO 1: Students will be able to demonstrate conceptual knowledge of law and develop legal reasoning.

PSO 2: Students will be able to demonstrate integrated knowledge of legal principles and social science.

PSO 3: Students will be able to exhibit skills in practices and procedures of law.

PSO4. Should have the capability to understand the laws at national and global level and to solve the client's problem.

PSO5. Should possess the skills to communicate in both oral and written forms and ability to formulate legal problems and using appropriate concepts and methods to solve them.

PSO6 should use skills in specific areas (e.g. Criminal, industrial-organizational, clinical, counselling, social, community).

PSO7 Should analyze social problems and understand social dynamics.

Course Name: Law of Contract-I

Course Code: BL-101

Course Outcomes

On completion of this course, the students will be able to

CO.1. understand the rationale of the essentials of a valid contract and differentiate between different kinds of contract.

CO.2. Exhibit an understanding of the General Principles and doctrines that guide Contract.

CO.3 Draw out a comparison between Indian Law of Contract and English Law of contract in the field of various business and investment laws.

CO.4 Assess and evaluate the various processes involved in contract formation in modern day Trade and commerce and be able to analyze a contract agreement when they go for internships, etc.

CO.5 Practically apply different aspects of Contracts determining the rights and liabilities of contractual parties, keeping the approach both theoretical and critical in nature.

Course Name: Legal Method and Legal Reasoning.

Course Code: BL-103

COURSE OUTCOMES

On completion of this course, the students will be able to

CO1: Understand & conceptualize the evolution, meaning & scope of the legal systems.

CO2: Understand & critically analyze the concept related to various sources of law.

CO3: Understand & critically analyze the concept related with Socio-Economic Approach and philosophy.

CO4: Critically analyze & evaluate the concepts related with legal aid & Lok Adalat.

CO5: Evaluate & Comparative Analysis of the multilateral aspects of the Legal system of India, U.K. & U.S.A.

Course Name: Family Law-I

Course Code: LLB-105

On completion of the course students will be able to :

CO1: Learn, appreciate and understand the sources and schools of Hindu Law.

CO2: Understand the basic concepts of Hind Law such as Hindu Joint family, Coparcener, Karta etc.

CO3: Understand the guiding principles of valid marriage and divorce followed under Hindu Law.

CO4: Gain knowledge of succession, partition, adoption, maintenance, and guardianship.

CO5: Gain skills of thinking, analyzing, verbal and written presentation of ideas of argument.

CO6: Students will be able to put their acquired knowledge into practice in their research on contemporary constitutional law issues.

Course Name: Constitutional Law – I

OBJECTIVE

1. Constitution of India is the pillar on which the governance of our country rests.
2. The course aims to examine the political, social and economic value structure of the Constitution of India.
3. The balancing of positive responsibility of the state to establish a economy of growth, social justice and political aspiration of all sections of the Indian society through Constitutional Governance.
4. The objective of this course is to make students understand the basic concepts of Indian constitution.

Course Name: Law of Torts & Consumer Protection Laws

Course Code: LLB-109

Course Outcome :

On completion of this course, the students will be able to

CO1: Analyse the foundational principles of the law of tort and consumer protection act.

CO2: To make students aware of relevant cases relating to tort law.

CO3: To familiarize the students with the difference between civil wrongs and criminal wrong

CO4: Students will be aware of the basic procedure for handling consumer dispute

CO5: Students will have a comprehensive undertaking about existing lawsc on consumer protection in India.

Course Name: General English

Course Code: HSS-103

Course Code: LLB 121

CO1: To introduce students to English legal resources in order to understand the legal language.

CO2: To enable the students to use legal vocabulary and terminology.

CO3: To enable successful and efficient communication (oral) appropriate to each situation.

CO4: To introduce students to various forms of legal writing appropriate to their specific needs.

CO5: To provide students with opportunities to develop basic English skills (written) in respect to topics dealt with in class.

Course Name: Social Awareness & Legal Awareness

Course Code: LLB-151

On completion of this course, the students will be able to

CO1. Learn about their rights and duties and basic features of the Indian constitution.

CO2. To create awareness about the various machineries/organs of the Justice delivery system available for redressal of their problems/grievances.

CO3. Learn about the procedure of approaching and utilizing various channels available for the redressal of grievances i.e. the Police, the Executive, and the Judiciary.

CO4. Discuss the basic concepts of labor law.

CO5. Learn the procedural guidelines mentioned under the criminal law system

Course Name: LAW OF CONTRACT II

Course Code: BL-102

Course Outcome

On completion of this course, the students will be able:

CO1: To analyze the concept and nature of Indemnity and Guarantee.

CO2. To Differentiate between Pledge and Bailment.

CO3. To familiarize Kinds of Agency, Rights and duties of agent.

CO4. To analyze the concept of Contract of sale.

CO5. To analyze the Formation of Partnership, Rights and Duties of partners.

Course Name: Environmental Law

Course Code: LLB-104

Course Objectives

On completion of this course, the students will be able to

CO1: Understand & conceptualize the evolution, Sources & fundamentals related with Environmental law.

CO2: Understand & critically analyze the concept related with Pollution & its types, Statues related with Air & Water for prevention & control of pollution and Coastal Zone Management.

CO3: Understand & critically analyze the laws related with forest management, Wildlife protection & Judicial Contribution with regards to wildlife protection.

CO4: Critically analyze & Evaluate contribution of domestic laws with regards to Land resources, Wetlands, Water resources & Ground water management.

CO5: Evaluate & analyze the contribution of Judiciary with regards to multilateral aspects related with Protection of Environment & Wildlife.

Course Name: FAMILY LAW II

Course Code: LLB-106

Course Outcome

CO1: To make students understand the scope, sources and schools of muslim law in India.

CO2: To familiarize students with muslim marriage, marital right and dower.

CO3: To analyze the concept of divorce and maintenance under muslim law.

CO4: To analyze the concept of gift, bequests, inheritance under muslim law

Course Name: Constitutional Law II

Course Code: LLB-108

Course Outcome

On completion of the course students will be able to :

CO1: To define the different organs of the state and their powers.

CO2: Explain centre state relations and the relations between the different organs of the state.

CO3: Critically evaluate the role and importance of constitutional bodies, functionaries and institutions.

CO4: critically analyze working of the Judiciary, Executive and Legislative bodies, their working and comparison with other similar legal systems of the world

CO5: critically analyze other miscellaneous provisions in constitution related to election, emergency and amendment.

CO6: Students will be able to put their acquired knowledge into practice in their research on contemporary constitutional law issues.

Course Name: Administrative Law

Course Code: LLB-112

Objective-

- 1) The objective of studying of administrative law is to understand the nature of administration and the rule of law.
- 2) To make students understand the nature, scope, concept, necessity and growth of Administrative law.

- 3) To familiarize the students with the conceptual and operational parameters of the general principles of the Administrative Law.
- 4) To make the students understand the difference between Constitutional law and administrative law.
- 5) To make the students aware of the working of Administration.

Course Name: International Law

Course Code: LLB-110

Course Outcomes

On completion of this course, the students will be able to

CO1: Understand & Conceptualize the evolution, Sources & interconnection with domestic law related with International law.

CO2: Understand & Critically analyze the concept related with State Territory, State Jurisdiction, Recognition & Acquisition related with Public International Law.

CO3: Understand & Critically analyze the concept related with State Succession, Extradition, Asylum & Settlement of Disputes related with Public International Law.

CO4: Critically analyze & Evaluate applicability of various laws which falls under the purview of Public International Law.

CO5: Evaluate the multilateral aspects of human rights & related enactment under the purview of Public International Law

Course Name: Legal English

Course Code: BL-114

CO1: To introduce students to English legal resources in order to understand the legal language.

CO2: To enable the students to use legal vocabulary and terminology.

CO3: To enable successful and efficient communication (oral) appropriate to each situation.

CO4: To introduce students to various forms of legal writing appropriate to their specific needs.

CO5: To provide students with opportunities to develop basic English skills (written) in respect to topics dealt with in class.

Course Name: LAW OF CRIME –I (IPC)

Course Code: BL-205

Course Outcome:

On completion of this course, the students will be able to

CO1: Identify ingredients of crime and basic Principles of Criminal Law.

CO2: learn how crimes are categorized by types and seriousness.

CO3: learn general exceptions mentioned under the IPC.

CO4: Analyze the different types of Punishments.

CO5: Identify types of marital offenses.

Course Name: Corporate Laws

Course Code: BL-201

COURSE OUTCOME:

On completion of this course, the students will be able to:

CO1: have an elementary understanding of various nuances of corporate law like corporate personality, doctrine of piercing the corporate veil etc.

CO2: Identify the relevant legal issues that arise on a given set of facts in the area of corporate law.

CO3: Explain and apply the principles of corporate law covered in the course

CO4: Analyze and predict how unresolved or ambiguous corporate law questions could be resolved by the courts through an analysis of case law and the judicial method.

Course Name: Property Law

Objective: Property Law is one of the basic fundamental law. It mainly deals with transfer of Immovable Property among the Living persons, The students are made aware regarding the basic principles of Transfer of Property as well as specific transfer like Election, Part Performance, Sale, Mortgage, Lease, Charge and Gift. This paper is very useful in practice for advocates since most of the common disputes are directly and indirectly associate with the Right to Property.

Course Name: Interpretation of Statutes

Course Code: BL-211

Course Outcome:

On completion of this course, the students will be able to

CO1: To make student understand the meaning, principles of interpretation.

CO2: To familiarize students with external aid, interpretation of penal and taxing statutes.

CO3: To analyze the key provision of rule of Ejusdem Generis and Noscitur-a-sociis.

CO4: To analyze the conceptual framework Rule of Pari Materia, and Stare Decisis.

CO5: To make aware of Legislation and Relationship between Law and Public Opinion.

Course Name: Labour and Industrial Law I

Objective-

- 1.To know the development and the judicial setup of Labour Laws.
- 2.To learn the salient features of welfare and wage Legislations.
- 3.To learn the laws relating to Industrial Relations, Social Security and Working conditions.
- 4.To understand the laws related to working conditions in different settings.

Course Name: Internship-I

Course Code: BL-251

Objective : Students are made to undergo mandatory one month internship and prepare a report based on that. The evaluation is done on the basis of Internship report and Viva.

Course Name: Moot Court-I

Course Code: BL-253

Objective- The objective of this subject is to teach students how to do legal research, present arguments and prepare memorial in a moot court along with basics professional ethics required in a court room.

Course Name: Criminal Procedure Code, 1978

Course Code: BL-202

Course Outcome

CO1:To make students understand the constitution, power and function of the criminal courts in India and distinguish between cognizable, non-cognizable, bailable and non-bailable offence and power and functioning of the police

CO2:To make students understand with law related to maintenance, investigation by police and jurisdiction of courts

CO3:To familiarise students with composition, working and jurisdiction of the LokAdalat.

CO4:To make students understand meaning, importance of Para Legal Services and its role in social transformation

CO5: To make student able to understand composition, functioning and power of National, State and District Legal Services Authority

Course Name: Law Relating to Right to Information

Course Code: BL-204

Course Objectives

On completion of this course, the students will be able to:

CO1: Understand & Conceptualize the evolution, meaning, scope & basics related with Right to Information & Free flow of Information.

CO2: Critically assess & analyze the provisions of “The Right to Information Act”.

CO3: Understand & critically analyze the involvement & contribution of the Judiciary with regards to right to information.

O4: Critically analyze & evaluate the role media involving different aspects & rights to information.

CO5:Evaluate the multilateral aspects of the concepts related with right to information with media & constitutional framework related with them & evaluate the practical applicability of RTI Act

Course Name: Labour and Industrial Law II

Course Code: BL-206

Objective-

1. To know the development and the judicial setup of Labour Laws.
2. To learn the salient features of welfare and wage Legislations.
3. To learn the laws relating to Industrial Relations, Social Security and Working conditions.
4. To understand the laws related to working conditions in different settings.

Course Name: Civil Procedure Code, 1908

Course Code: BL-208

Course Objective:

1. To provide adequate knowledge about procedures/rules of litigation in the civil courts. The students ought to be aware of the procedural aspects of the enforcement of civil rights in the Indian courts.
2. To give an overview of law of limitation for institution of suit, appeal, review, reference etc. since the law assists the vigilant and not those who sleep over the rights.
3. To view some of the current problems arising out of the procedural technicalities like delay in getting order, Judgment and decree in civil litigations. In some civil cases, even generations pass but no final decision comes out from the court, which is now a point of discussion in the society. To apprise the students with latest amendments in the Code of Civil Procedure is also one of the main objects.
4. To discuss about the nuances of the Civil Procedure and inculcate in them the basic traits of civil practice.

Course Name: Law of Crime –II (IPC-II)

Course Code: BL-210

Course Outcome

Students will be able to:

CO1: understand the basic philosophy underlying the concept of crime, and categories of as well as parties to crime.

CO2: Analyze lacunas within the criminal justice system and suggest the amendments have to make to provide the justice according to the changing needs of the society.

CO3: Summarize the process of judicial review and identify criteria used by courts to evaluate the constitutionality of criminal law of India.

CO4: Understand and describe areas of criminal justice, law and society through a critical analysis of the subject

CO5: Problem-solve complex issues in the criminal justice system and society related to policy, law enforcement, vulnerability, and marginalization

Course Name: Arbitration Conciliation & Alternative Dispute Resolution System (Theory)

Course Code: BL-212

Course Outcome

CO1: To make student understand the domestic and international commercial arbitration.

- CO2: To familiarize students with difference between ADR and other dispute mechanism.
CO3: To analyze the key provision of Arbitration and conciliation Act 1996.
CO4: To analyze the conceptual framework related to various ADR process.
CO5: To make aware of various conventions related to Arbitration dispute resolution

Course Name: Internship-II

Course Code: BL-252

Objective : Students are made to undergo a mandatory one-month internship and prepare a report based on that. The evaluation is done based on the Internship report and Viva.

Course Name: Law of Evidence

Course Code: BL-303

Course Objective:

The law of evidence is one of the most important branches of adjective law. Evidence is the pivot on which the whole edifice of administration of justice rests. It involves several questions, such as what is evidence, typology of evidence, how it is produced before a Judicial Authority and what is the role of the evidence in the administration of justice. The study of the law of evidence is most important in the field of legal education

- To acquaint the students with basic principles of the law of evidence;
- To enable them to understand the importance of evidence in the system of administration of justice.
- To enable them to analyze critically the rules of evidence and its application to a given fact situation.

Course Name: Law of Trust Equity & Fiduciary Relationship

Course Code: BL--305

At the end of the course, students should be able to:

C01 –identify and state a clear understanding of the law of trust, equity and fiduciary relationship and how it applies to whole of civil law in India.

C02 –identify the different types of principles of equity and equitable remedies.

C03 – distinguish between different types of trust and analyse the powers rights and duties of a trustee

C04 –critically analyse the theoretical and philosophical underpinnings of the law of equity and trust

C05 –critique the societal impact of the law of equity and trust

Course Name: Principles of Taxation

Course Code: BL-307

Course Objective:

1. Taxation is a general law made by governments to collect revenue from people and organizations.
2. A tax formula contains at least three elements: the definition of the base, the rate structure, and the identification of the legal taxpayer.

3. The base multiplied by the appropriate rate gives a product, called the tax liability, which is the legal obligation that the taxpayer must meet at specified dates.
4. A tax is identified by the characteristics of its base, such as income in the case of an income tax.
5. The paper is helpful to the students in understanding the theoretical as well as practical aspects of Taxation Policy of the Government.

UNIT-I

(Lecture: 7)

Course Name: Land Laws including ceiling and other Local Laws

Course Code: BL-309

COURSE OUTCOMES

On completion of this course, the students will be able to:

CO1: Understand and analyze legislative power to make laws relating to land and land ceiling is in the state list.

CO2: Understand & analyze different states' enactment on tenancy & ceiling of Punjab & Haryana respectively.

CO3: Understand & critically analyze the regulations related to rent & other aspects of Haryana.

CO4: Critically analyze & evaluate the working & functions of panchayats with regards to land-related matters.

CO5: Evaluate & Critical analysis the multilateral aspects of the panchayat samities & revenue sources.

Course Name: Jurisprudence

Course Code: BL-311

Course Outcome:

On completion of this course, the students will be able to

CO1: learn meaning, definitions and different theories of law.

CO2: Discuss different school of law.

CO3: Develop the idea of administration of justice, public interest litigation, legal aid etc.

CO4: Familiarize with the idea of different sources of law.

CO4. Learn about rights and duties, possession and ownership etc.

Course Name: Drafting, Pleading, and Conveyance (Theory)
Course Code: BL-313

Course Objective:
Course Outcome

- CO1: To make student understand the domestic and international commercial arbitration.
- CO2: To familiarize students with difference between ADR and other dispute mechanism.
- CO3: To analyze the key provision of Arbitration and conciliation Act 1996.
- CO4: To analyze the conceptual framework related to various ADR process.
- CO5: To make aware of various convention related to Arbitration dispute resolution.

Course Name: Moot Court-II
Course Code: BL-351

Objective- The objective of this subject is to teach students how to do legal research, present arguments and prepare memorials in a moot court along with the basics professional ethics required in a court room.

Course Name: Intellectual Property Law
Course Code: BL-302

Course Outcome

On completion of the course, students will be able to:

- CO1: Understand the significance and basic concept intellectual property law,
- CO2: Develop sound understanding of procedural knowledge relating to intellectual property
- CO3: Apply knowledge towards solving complex intellectual property problems in real life
- CO4: Recognise and interpret new emerging issues in the field of intellectual property related to information technology, internet, international trade etc.
- CO5: Evaluate what constitutes infringement of intellectual property and what are the remedies available to a person
- CO6: Find the loopholes in current intellectual property law and suggest changes.

Course Name: Information Technology & Cyber Law
Course Code: BL--304

Objective-

On completion of this course, the students will be able to:

CO1: Understand & Conceptualize the evolution, meaning, scope & basics related with Right to Information & Free flow of Information.

CO2: Critically assess & analyze the provisions of “The Right to Information Act”.

CO3: Understand & critically analyze the involvement & contribution of the Judiciary with regards to right to information.

O4: Critically analyze & evaluate the role media involving different aspects & rights to information.

CO5: Evaluate the multilateral aspects of the concepts related with right to information with media & constitutional framework related with them & evaluate the practical applicability of RTI Act.

Course Name: Banking and Insurance Law

Course Code: BL-306

CO1: The students will be able to identify the kinds of Negotiable Instruments and its features

CO2: to understand the relationship between Banker and customer through general and special relationships.

CO3: to familiarize students with services provided by the Commercial Banks, RRB and Cooperative banks.

CO4: to analyze the latest trends and regulations in Commercial banks

CO5: to make students understand the importance of RBI

Course Name: Criminology, Victimology & Penology

Course Code: LLB-308

CO1: To make students understand the theoretical and historical perspectives of criminology.

CO2: To familiarize students with White collar crime, Crime against Women and Children, and Terrorism.

CO3: To analyze the key provision of juvenile delinquency.

CO4: To analyze the conceptual framework related to Indian crime reality.

CO5: To make aware of various punishments and their justification.

Course Name: Human Rights Law

Course Code: BL-308

On completion of the course, students will be able to:

CO1: Understand the significance and basic concept of human rights,

CO2: Form linkage between human rights, fundamental rights, and fundamental duties.

CO3: Learn different causes of human rights violations and how can justice be given to victims.

CO4: Learn about international treaties and conventions related to human rights.

CO5: Evaluate the relationship between international and municipal law on human rights.

CO6: Find the loopholes in the human rights system and suggest changes.

Course Name: INTERNSHIP-III

Course Objectives

Through internship, a law student gains practical experience and contemporaneously inculcates work ethics by interning either under a lawyer or a law firm or a government body participating in legal sphere or a research organization or any other legally-oriented institution. Prime objective is to prepare student to demonstrate desirable qualities & professional ethics to be employable in different fields related with legal profession.



Lingaya's Vidyapeeth

(Deemed To Be University U/S 3 Of UGC Act, 1956)

M.Tech - Mechanical Engineering 2021-22

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

ME-501	Simulation, Modelling & Analysis	L- T- P	Cr
		3- 1 - 0	4

Course outcomes

CO1: understanding of fundamental concepts, principles, and techniques in simulation, modeling, and analysis within various domains.

CO2: To develop appropriate mathematical, statistical, and computational models to represent real-world systems accurately.

CO3: To validate and verify simulation models, ensuring their reliability and accuracy in representing real-world phenomena.

CO4: To be equipped with a diverse set of analysis techniques, including sensitivity analysis, optimization, and statistical inference, to interpret simulation results effectively and draw meaningful conclusions.

CO5: Experimental design and be capable of designing simulation experiments to investigate hypotheses and analyze system behavior under different scenarios.

Simulation, Modelling & Analysis ME-501	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	CO1	1				1					2		1		
	CO2				2			1		1			1		1
	CO3	1	2	1			1		1		2		1		
	CO4	1									1				
	CO5	1			1						1		1	1	

AM-501	Advanced Engineering Mathematics	L- T- P	Cr
		3- 1 - 0	4

Course outcomes:

CO1: Achieve a comprehensive understanding and proficiency in advanced mathematical concepts essential for engineering, including calculus, differential equations, linear algebra, and complex analysis.

CO2: Apply advanced mathematical techniques to analyze and solve complex engineering problems across various domains, demonstrating the ability to formulate mathematical models and derive solutions relevant to engineering applications.

CO3: Develop strong skills in numerical methods, including finite element analysis, numerical integration, and optimization algorithms, enabling the approximation of solutions to engineering problems and the validation of analytical results through computational approaches.

CO4: Utilize transform methods and Fourier analysis to analyze signals, systems, and phenomena encountered in engineering practice, facilitating insights into signal processing, communication systems, and control theory applications.

CO5: Enhance critical thinking abilities to evaluate mathematical models and methodologies critically, while also improving communication skills to effectively convey complex mathematical concepts and solutions to diverse audiences within the engineering community.

Advanced Engineering Mathematics AM501	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	CO1	1				1					2		1		
	CO2	1			1					1			1		1
	CO3	1		1			1		1		1		1		
	CO4							1			2				
	CO5	1				2					1		1		1

ME-503	Advanced Heat & Mass Transfer	L- T- P	Cr
		3- 1 - 0	4

Course Outcomes

CO1: Gain a deep understanding of the principles, theories, and mathematical models governing heat and mass transfer processes in complex engineering systems.

CO2: Apply advanced analytical and numerical techniques, including differential equations, finite element analysis, and computational fluid dynamics, to analyze and solve complex heat and mass transfer problems encountered in engineering practice.

CO3: Develop the ability to identify, formulate, and solve heat and mass transfer problems in multidisciplinary engineering contexts, integrating knowledge from thermodynamics, fluid mechanics, and materials science to design efficient and sustainable engineering solutions.

CO4: Design and conduct experiments to investigate heat and mass transfer phenomena, analyze experimental data using statistical methods, and validate theoretical models, enhancing skills in experimental design, instrumentation, and data interpretation.

CO5: Explore advanced applications of heat and mass transfer principles in cutting-edge technologies such as microscale heat transfer, nanofluids, renewable energy systems, and thermal management of electronic devices, fostering awareness of emerging trends and innovations in the field.

Advanced Heat & Mass Transfer ME503	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	CO1	1				1					2		1		
	CO2				2			1		1			1		1
	CO3	1	2	1			1		1		2		1		
	CO4	1									1				
	CO5	1			1						1		1		1

ME- 505	CAD/CAM	L- T- P	Cr
		3- 1 - 0	4

Course Outcomes:

CO1.Students will be able to apply knowledge about various methods.

CO2.Students will be able to apply knowledge about Computer Aided Quality control.

CO3.Students will be able to apply knowledge about Process Planning Control.

CO4. Students will be able to Design Flexible manufacturing cell after carrying out Group technology study and finally creating FMS.

CO5. To design a system, components, or process and meet specific objectives keeping in view the economical approaches, availability of materials and manufacturability with increased life.

CAD/CAM ME-505	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	CO1	1	2						1	1	2	3	1		
	CO2	1	1	2	1	1	1	2				3	2	2	
	CO3	2	1					2	2	1	1	3	3	2	
	CO4	1	2			2	1	1				2	3		
	CO5	1	1		2	2			2	2	2	2	2		

RM-501	Research Process And Methodology	L- T- P	Cr
		3- 1 - 0	4

APPENDIX-II

Course outcomes:

CO1: Gain a comprehensive understanding of the fundamental principles and concepts underlying the research process, including research design, methodology selection, and ethical considerations.

CO2: Develop proficiency in designing research studies by formulating research questions, hypotheses, and objectives, selecting appropriate research methodologies, and designing data collection methods and instruments.

CO3: Acquire skills in conducting comprehensive literature reviews, critically evaluating existing research, identifying gaps in the literature, and synthesizing relevant knowledge to inform the research design and methodology.

CO4: Gain practical experience in collecting, managing, and analyzing research data using qualitative and/or quantitative methods, including statistical analysis, qualitative coding, and data visualization techniques.

CO5: Enhance communication skills for effectively presenting research findings through written reports, oral presentations, and visualizations, and disseminating research outcomes to diverse audiences, contributing to the advancement of knowledge in the field.

Research Process And Methodology RM 501	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		CO1	1	2						1	1	2	3	1	
CO2	1	1	2	1	1	1	2				3	2	2		
CO3	2	1					2	2	1	1	3	3	2		
CO4	1	2			2	1	1				2	3			
CO5	1	1		2	2			2	2	2	2	2			

ME-517	Mechanical Engineering Lab-I	L- T- P	Cr
		0- 0 - 4	2

Course outcomes:

Cutting of gears using simple indexing method on the Milling Machine

Course outcomes:

CO1.To learn various concepts of instrumentation, metrology & computer assisted inspection.

CO2. To have practical view of various measuring, gauging instruments .CO3.Complete evaluation of newly developed products.

CO4.Determination of Process Capabilities.

CO5.Determination of the measuring instrument capabilities and ensure that they are quite sufficient for the irrespective measurements.

Mechanical Engineering Lab-I ME517	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO	PSO1	PSO2
	CO1	2		2	2	1			2		1	2	2	1	
	CO2					1	1	2	2				1		
	CO3	2					1				1	2	1	2	
	CO4	1		1	2		1		1	2	3		2		
	CO5	2	1		2		1					1	1		

ME-502	Statistical Quality Control	L- T- P	Cr
		3- 1 - 0	4

Course Outcome
CO1:- Given a set process data, characterize the process behavior using descriptive statistics
CO2:- Given sampled process data over time, establish control charts for monitoring processes
CO3:- Identify if the process is in control. If not, identify special patterns that may exist
CO4:- Given a process that is in control and the process specification, identify if a process is capable
CO5:- Given a measurement system, design a plan to identify if the measurement system is capable

Statistical Quality Control ME-502	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	CO1	1				1					2		1		
	CO2				2			1		1			1		1
	CO3	1	2	1			1		1		2		1		
	CO4	1									1				
	CO5	1			1					1		1	1		1

ME-504	Advanced Mechanics of Solids	L- T- P	Cr
		3- 1 - 0	4

Course outcomes:

- CO1.To understand fundamentals regarding advanced Mechanics of Solids.
CO2.To develop ability of students to carry out analysis of complex state of stress.
CO3.To familiarize students about the failure modes of materials.
CO4.To enhances kills of utilizing materials of appropriate strength for mechanical engineering applications.
CO5.To familiarize the students to solve complex problems under various loading conditions

Advanced Mechanics of Solids ME504	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		CO1	1				1					2		1	
CO2				2			1		1			1			1
CO3	1	2	1			1		1		2		1			
CO4	1									1					
CO5	1			1					1		1	1			1

ME-506	Power Plant Engineering	L- T- P	Cr
		3- 1 - 0	4

OUTCOMES:

Upon the completion of this course the students will be able to

CO1 Explain the layout, construction and working of the components inside a thermal power plant.

CO2 Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.

CO3 Explain the layout, construction and working of the components inside nuclear power plants.

CO4 Explain the layout, construction and working of the components inside Renewable energy power plants.

CO5 Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.

MANUFACTURING SCIENCE	ME-208	Course outcomes	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
			1	2	3	4	5	6	7	8	9	0	1	1	1	1
		CO1	1				1						2		1	
		CO2				1			1		1				1	
		CO3	1		1			1		1		2		1		
		CO4	1					1				1				
		CO5	1			1					1		1	1		

ME-518	Mechanical Engineering Lab-II	L- T- P	Cr
		0- 0 - 4	2

Course outcomes:

CO1.To learn various concepts of instrumentation, metrology & computer assisted inspection.

CO2. To have practical view of various measuring, gauging

instruments .CO3.Complete evaluation of newly developed products.

CO4.Determination of Process Capabilities.

CO5.Determination of the measuring instrument capabilities and ensure that they are quite sufficient for the irrespective measurements.

Mechanical engineering lab ME-518	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	CO1	1				1					1		1		
	CO2				1					1			1		
	CO3	1		1	2				1		1		1		
	CO4	1					1				1				
	CO5	1			1					1		1	1		

Elective-I

ME5E12	Vibration Engineering	L- T- P	Cr
		3- 0 - 0	3

Course outcomes:

- CO1. Distinguish the types of vibration and its effect on the system
 CO2. Associate the system response an exposure to various forced vibrations.
 CO3. Classify forces in mechanical system and related vibration issues to solve the problem
 CO4. Compute the parameters of vibration in the rotor systems
 CO5. Compute the static and dynamic balancing through vibration analysis

Mechanical engineering lab ME-518	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		CO1	1				1					1		1	
CO2				1					1			1			
CO3	1		1	2				1		1		1			
CO4	1					1				1					
CO5	1			1					1		1	1			

ME-601	Smart Manufacturing Systems	L- T- P	Cr
		3- 1 - 0	4

Course Outcomes:

On successful completion of this course, the students should be able to:

- Have a knowledge of smart manufacturing systems' components and can handle it more effectively.in context of Industry 4.0
- After understanding the Architecture of Cyber- Physical system (CPS) they can make machines more oriented towards Industry 4.0, which increases productivity
- Overall brief description of associated technologies of smart manufacturing systems enhance their workability knowledge in the industries
- After understanding IoT connectivity for Industry 4.0 they are able to make a system Taylor made as per requirement of the industry
- Eventually knowledge of smart manufacturing systems enhances their employability opportunities as a whole.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	3	1	2	1			1	2	2	1	1	1	2	2
CO2	2	3	1	2	1			2	2	2	2	2	2	2	2
CO3	3		2			1	1		1	3	1				
CO4	2	1	3	1		1	1	2	1	1	1	1	1	1	1
CO5	2	1	1	1		2		2	1	2	1	1	1	1	1

ME-603	Finite Element Method	L- T- P	Cr
		3- 1 - 0	4

Course outcomes:

CO1: Develop a comprehensive understanding of the theoretical foundations of the finite element method, including variational principles, interpolation functions, discretization techniques, and numerical integration methods.

CO2: Acquire proficiency in creating finite element models for engineering problems by discretizing complex geometries, applying appropriate boundary conditions, and selecting suitable element types and meshing strategies.

CO3: Master numerical solution techniques for solving finite element equations, including direct and iterative solvers, eigenvalue analysis, transient analysis, and nonlinear analysis methods, to accurately simulate the behavior of engineering structures and systems.

CO4: Learn techniques for verifying and validating finite element models, including convergence studies, sensitivity analysis, comparison with analytical solutions, and experimental validation, to ensure the accuracy and reliability of simulation results.

CO5: Apply the finite element method to solve engineering problems in various disciplines, such as structural mechanics, heat transfer, fluid dynamics, and electromagnetics, to analyze complex systems, optimize designs, and predict performance under different operating conditions.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1	1	2			1	1	2	1	1	1	2	2
CO2	2	1	1	2	1			2	1	2	2	2	2	2	2
CO3	3	2	2			1	1		2	3	1				
CO4	2	1	3	1		1	1	2	2	1	1	1	1	1	1
CO5	2		1	1		2		2	1	2	1	1	1	1	1

ME-617	Mechanical Engineering Lab-III	L- T- P	Cr
		0- 0 - 4	2

Course outcomes:

CO1.To learn various concepts of instrumentation, metrology & computer assisted inspection.

CO2. To have practical view of various measuring, gauging instruments .CO3.Complete evaluation of newly developed products.

CO4.Determination of Process Capabilities.

CO5.Determination of the measuring instrument capabilities and ensure that they are quite sufficient for the irrespective measurements.

Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3				2					1		1		
CO2	3			1					1			1		
CO3	3		1	2				1		1		1		
CO4	3					2				1				
CO5	2			2					1		1	1		

LINGAYS VIDYAPEETH
DEPARTMENT OF MECHANICAL ENGINEERING
2021-22

Vision

To be known as a premier department in mechanical engineering by synergizing teaching, learning and research to produce competent Mechanical Engineers with an exposure to interdisciplinary engineering knowledge.

Mission

MD1: Create an effective foundation in the field of production, design, thermal, industrial and automation engineering by imparting quality education.

MD2: Conduct interdisciplinary research leading to the delivery of innovative technologies through Problem and Research Based Learning.

MD3: Provide relevant industrial experience that instills the problem-solving approach; integrate the product design to manufacturing life cycle management.

MD4: Prepare students for careers in academia and various industrial organization related to mechanical and allied engineering.

1. PROGRAM EDUCATIONAL OBJECTIVES

PEO1: Graduates of Mechanical Engineering shall be engineering professionals and innovators in core engineering, service industries or pursue higher studies.

PEO2: Graduates of Mechanical Engineering shall be competent in latest technologies by exploiting automation and smart manufacturing tools to address various industry 4.0 problems.

PEO3: Graduates of Mechanical Engineering shall leverage their imbibed skill through continuous working on technologies like drone and additive manufacturing knowledge to transform the society.

2. PROGRAM OUTCOMES

- **PO1. Engineering Knowledge:** Apply the knowledge of Mathematics, Science, and Engineering fundamentals, and an engineering specialization to solution of complex engineering problems.
- **PO2. Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

- **PO3. Design/development of solutions:** Design of solutions for complex engineering problems and design of system components or processes that meet the specified needs with appropriate considerations of public health and safety, and cultural, societal, and environmental considerations.
- **PO4. Conduct investigations of complex problems:** Use research-based methods including design of experiments, analysis and interpretation of data and synthesis of information leading to logical conclusions.
- **PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling complex engineering activities with an understanding of limitations.
- **PO6. The engineer and society:** Apply reasoning within the contextual knowledge to access societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in the societal and environmental contexts, and demonstrate the knowledge of, and the need for sustainable developments.
- **PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
- **PO9. Individual and team work:** Function effectively as an individual independently and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large such give and receive clear instructions.
- **PO11. Project management and finance:** Demonstrate knowledge and understanding of engineering management principles and apply those to one's own work as a member and leader of a team to manage projects in multidisciplinary environments.
- **PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

3. PROGRAM SPECIFIC OUTCOMES B.Tech (ME)

- **PSO1:** Students are trained to perform tasks related to conversion of mechanical system to automatic system, integrating mechanical system to IOT and cloud-based technologies.
- **PSO2:** Students are practiced to use augmented reality / virtual reality along with different CAE tools for rapid prototyping and additive manufacturing.



Department of Mechanical Engineering

For

**B.Tech Mechanical Specialization with
Automation & Smart Manufacturing
(2021-22 Batch)**

(III SEMESTER)

Course code	Course title	L	T	P	Credits
BSC-201	MATH-III (NUMERICAL METHODS)	3	1	0	4

Course objective:

CO1. The objective of this course is to familiarize the students with statistical techniques.
CO2. It aims to equip the students with standard concepts and tools at an intermediate to advanced Level that will serve them well towards tackling various problems in the discipline.

Course outcomes:

1. The mathematical tools needed in evaluating multiple integrals and their usage.
2. The effective mathematical tools for the solutions of differential equations that model physical processes.

Course code	Course title	L	T	P	Credits
ME -201 C	MANUFACTURING PROCESS	3	0	0	3

Course Objectives:

To provide an overview of the basic production techniques and allied / supporting techniques used to produce finished products from raw materials.

In addition to theory, students will be given practical training on various basic production techniques. After going through this course, the students will be in a position to understand the working of a mechanical workshop.

Course outcomes:

CO1-Select appropriate Manufacturing Processing to manufacture any component.

CO2-Interpret foundry practices like pattern making, mold making, Core making and Inspection of defects.

CO3-Differentiate various metal forming processes such as Hot and Cold Working, Rolling, Forging, Extrusion and Drawing Processes.

CO4-Classify different plastic molding processes, Extrusion of Plastic and Thermoforming.

CO5-Select appropriate Joining Processes to join Work piece.

Course code	Course title	L	T	P	Credits
ME-203 C	FLUID MECHANICS	3	1	0	4

Course Objectives:

It imparts the basic concept; knowledge and laws of fluid flow; Fluid dynamics and kinematics and idea of estimation

Course outcomes:

CO 1-Students will be able to understand basic knowledge of the definition and the fundamental concepts of fluid mechanics including continuum, velocity field, surface tension, flow visualization etc.

CO 2-Students will be able to apply the basic equation of fluid statics to determine forces on planer and curved surfaces that are submerged in a static fluid.

CO 3-Students will be able to use conservation laws in integral form and apply them to determine forces and moments on surfaces of various shapes and simple machines

CO 4-Students will be able to use Euler's and Bernoulli's equations and the conservation of mass to determine velocities, pressures, and accelerations for incompressible and in viscid fluids

CO 5- Students will be able design simple pipe systems to deliver fluids under specified conditions and also the losses during the flow of the fluid.

Course code	Course title	L	T	P	Credits
ME – 205 C	ENGINEERING MECHANICS	3	1	0	4

Course Objectives:

Engineering Mechanics is one of the core subjects that introduces the student to analysis of forces and motion and prepares the student for studying strength of materials and theory of machines.

Course Outcome:

CO1. Solve engineering problems involving the equilibrium of particles and rigid bodies.

CO2. Solve the problems involving dry friction and virtual work.

CO3. Determine the centroid, center of gravity, and moment of inertia of various surfaces and solids.

CO4. Solve problems related to kinematics and kinetics of a rigid body.

CO5. Solve problems using the energy-momentum principle for a particle and rigid bodies in plane motion.

Course code	Course title	L	T	P	Credits
ME-207 C	THERMODYNAMICS	3	1	0	4

Course Objectives:

This course introduces the student to the fundamental laws of thermodynamics, the interaction between Energy and m

Course outcome:

Course Outcome:
CO1-Students will be able to explain the basic principles and applications of the thermodynamics to the various real life systems.
CO2-Students will be able to describe fundamental laws of thermodynamics.
CO3-Students will be able to apply the concepts such as Entropy, Energy Balance also the calculations of heat, work and other important thermodynamic properties for various ideal gas processes.
CO4-Students will be able to estimate performance of various thermodynamic gas power cycles and gas refrigeration cycle and availability in each case.
CO5-Students will be able to examine the condition of steam and performance of vapour power cycle and vapour compression cycle

ME-251C	MANUFACTURING PROCESS LAB	0	0	2	1
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Course outcomes:

CO1.To build practical knowledge about Pattern Making; pattern material, pattern allowances and types of patterns casting processes

CO-2: To apply practical understanding for use of moulding tools: green sand moulding, gating system, risering system, core making;

CO-3: To plan and create jobs using forging processes;

CO-4: To understand and plan for machining of gears;

CO-5: To relate the job manufactured from practical relevance point of view

Course code	Course title	L	T	P	Credits
ME-253 C	FLUID MECHANICS LAB	0	0	2	1

Course Objectives:

Students can able to have hands on experience in flow measurements using different devices and also perform calculations

Course outcomes:

1. Utilize basic measurement techniques of fluid flow
2. Demonstrate practical understanding and applications of Bernoulli's Equation
3. Analyze the friction losses in pipes.
4. Gaining knowledge to calculate and design engineering applications involving fluid.
5. Understanding of analyzing flow systems in terms of mass, momentum, and energy balance.

IV SEMESTER

Course code	Course title	L	T	P	Credits
ME-202 C	APPLIED THERMODYNAMICS	3	1	0	4

Course Objectives:

It enables the students to understand the use of thermodynamic laws in design and functioning of Various equipment

Course outcomes:

CO1-Students will be able to explain the basic principles and applications of the thermodynamics to the various real life systems.

CO2-Students will be able to describe fundamental laws of thermodynamics.

CO3-Students will be able to apply the concepts such as Entropy, Energy Balance also the calculations of heat, work and other important thermodynamic properties for various ideal gas processes.

CO4-Students will be able to estimate performance of various thermodynamic gas power cycles and gas refrigeration cycle and availability in each case.

CO5-Students will be able to examine the

Course code	Course title	L	T	P	Credits
ME-204 C	STRENGTH OF MATERIALS	3	1	0	4

Course Objectives:

The strength of materials is one of the core subjects and aim is to provide a sound foundation to design various elements

Course outcomes:

CO1-Students will be able to predict mechanical behavior of the member by determining the stresses, strains and deflections produced by the loads up to the elastic limit.

CO2- Students will be able to solve the stresses in determinate and indeterminate, homogeneous and composite bars under concentrated loads, self-weight and thermal loads.

CO3-Students will be proficient to construct Shear Force and Bending Moment diagrams for statically determinate beam due to concentrated load, uniformly distributed load, uniformly varying load and couple.

CO4-Students will be able to determine bending and shear stresses in machine elements

CO5-Students will be able to Evaluate Slope and Deflection of Statically Determinate beams subjected to concentrated load, uniformly distributed load, uniformly varying load and couple and also strain energy in members subjected to Gradual, sudden and impact loads

Course code	Course title	L	T	P	Credits
ME-206 C	FLUID MACHINERY	3	1	0	4

Course Objectives: The students completing this course are expected to understand the properties of fluids, its kinematic and dynamic behavior through various laws of fluids like continuity, Euler's, Bernoulli's equations, energy and momentum equations. Further, the student shall be able to understand the theory of boundary layer, working and performance characteristics of various hydraulic machines like pumps and turbine

Course outcomes:

CO1.Students can able to Examine Single Acting &Double Acting Compressor

CO2.Students can able to understand the basic concepts of Gas power cycles

CO3. Students can able to compare various steam Turbine & Steam Nozzle

CO4. An overall idea about fluid machinery and the knowledge about the calculation of efficiency, power developed by a turbines and power required by a pump.

CO-5: Able to understand basic working principles of various hydraulic machines

Course code	Course title	L	T	P	Credits
ME-208 C	KINEMATICS OF MACHINES	3	1	0	4

Course Objectives:

To understand the basic components and layout of linkages in the assembly of a system / machine.

To understand the principles in analyzing the assembly with respect to the displacement, velocity, and acceleration.

To understand the basic concepts of toothed gearing and kinematics of gear trains and the effects of friction in motion.

Course outcomes:

1.	Upon completion of this course, the students can able to apply fundamentals of mechanism for the design of new mechanisms and analyse them for optimum design.
2.	Students can able to understand the effects of friction in motion transmission and in machine components.
3.	understand the motion resulting from a specified set of linkages, design few linkage mechanisms and cam mechanisms for specified output motions
4.	It enables design of cam mechanisms for specified output motions and solving of problems in toothed gear trains and the effects of friction in machine components.
5.	Gain knowledge on the basic concepts of mechanisms, cam, gear train and their kinematics.

Course code	Course title	L	T	P	Credits
	ENGINEERING MANAGEMENT	3	0	0	3

Course Objectives:

To gain an understanding and appreciation of the principles and applications relevant to the planning, design and
 To develop skills necessary to effectively analyze and synthesize the many inter-relationships inherent in comp

Course outcomes:

- | | |
|----|---|
| 1. | Explain the various parts of the operations and production management processes and their interaction with other business functions (strategy, engineering, finance, marketing, HRM, project management and innovation) |
| 2. | Develop the ability to identify operational methodologies to assess and improve an organizations performance |

Course code	Course title	L	T	P	Credits
ME-252 C	APPLIED THERMODYNAMICS LAB	0	0	2	1

Course Objectives:

To supplement the principles learnt in Energy conversion. To understand how turbines are working.

Course outcomes:

CO1. To apply the knowledge of mathematics, science and engineering fundamentals to model the energy conversion phenomenon.

CO2. To identify and formulate power production based on the fundamentals laws of thermal engineering

CO3. Students can able to understand the basic concepts of Gas power cycles

CO4. Students can able to compare various steam Turbine & Steam Nozzle

CO5. Students can able to Examine Single Acting & Double Acting Compressor

Course code	Course title	L	T	P	Credits
ME-254 C	STRENGTH OF MATERIALS LAB	0	0	2	1

Course Objectives:

To expose the students to the testing of different materials under the action of various forces and determination of the

Course outcomes:

CO1 Able to study the stress-strain curves of different materials used in the field under different loading conditions.

CO2. Ability to function on multi-disciplinary teams in the area of materials testing.

CO3. Students will have the required knowledge in the area of testing of materials and components of structural elements experimentally

CO4. Test the different materials under the action of various forces and determine their characteristics experimentally

CO5 Apply theoretical knowledge about the Mechanics of Solids with practical testing for determining the strength of materials under externally applied loads.

Course code	Course title	L	T	P	Credits
ME-256 C	FLUID MACHINERY LAB	0	0	2	1

Course Objectives:

To have hands on experience in flow measurements using different devices and also perform characteristic stud

Course outcomes:

CO1.Ability to use the measurement equipment's for flow measurement

C O2.Ability to use the measurement equipment's for flow measurement

CO3.Ability to do performance trust on different fluid machinery

CO4. Identify importance of various fluid properties at rest and in transit. Understand the concept of boundary layer theory and flow separation. Plot velocity and pressure profiles for any given fluid flow.

CO5. Evaluate the performance characteristics of hydraulic turbines and pumps

Course code	Course title	L	T	P	Credits
ME-258 C	KINEMATICS OF MACHINE LAB	0	0	2	1

Course Objectives:

To supplement the principles learnt in kinematics and Dynamics of Machinery. To understand how certain measuring

Course outcome:

CO1. Ability to demonstrate the principles of kinematics and dynamics of machinery CO2. Ability to use the measuring devices f

CO3. To provide a foundation for the study of machine design. CO4. To provide a foundation for the study of machine design. C

Course code	Course title	L	T	P	Credits
ME-260 C	MACHINE DRAWING	0	0	4	2

Course Objectives:

This course makes the student to learn the presentation of components and assemblies in to various views and vice v

Course outcomes:

- CO1. Upon completion of this course, the students can able to perform free hand sketching of basic geometrical constructions and multiple views of objects.
- CO2. Students can able to prepare isometric and perspective sections of simple solids
- CO3. Students can able to demonstrate computer aided drafting
- CO4. Students will get insight of technical skills regarding assembly, production and part drawings.
- CO5. Students will be familiarized with various limits, fits and tolerances.

V SEMESTER

Course code	Course title	L	T	P	Credits
ME-301 C	DYNAMICS OF MACHINES	3	1	0	4

Course Objectives:

To understand the force-motion relationship in components subjected to external forces and analysis of standard mechanism.
To understand the undesirable effects of unbalances resulting from prescribed motions in mechanism.
To understand the effect of Dynamics of undesirable vibrations

Course outcomes:

- CO1. Upon completion of this course, the Students can able to predict the force analysis in mechanical system and related vibration issues and can able to solve the problem.
- CO2. Implement the concept of Cam systems and their analysis of Forced vibration.
- CO3. Apply principles of governors and gyroscopes.
- CO4. Students will be equipped with fundamental knowledge of dynamics of machines so that student can appreciate problems of dynamic force balance, transmissibility of forces, isolation of systems, vibrations.
- CO5. Develop knowledge of analytical and graphical methods for calculating balancing of rotary and reciprocating masses.

Course code	Course title	L	T	P	Credits
ME- 303 C	MANUFACTURING TECHNOLOGY	3	0	0	3

Course Objectives:

1. To gain theoretical and practical knowledge in material casting processes and develop an understanding of the dependent and independent variables which control materials casting in a production setting.
2. Introduce students to good foundry practices and product design considerations.
3. Provide an overview of joining processes; discuss in detail the weld the welding process and the physics of welding.
4. Introduce students to different welding processes weld testing and advanced processes to be able to appreciate the practical applications of welding.

Course outcomes:

- CO1. Upon completion of this course, the students can able to apply the different manufacturing Process and use this in industry for component production.
- CO2. Students can able to understand the concepts of basic manufacturing processes and fabrication techniques
- CO3. The main objective of this course is to emphasize the importance manufacturing sciences in the day-to-day life, and to study the basic manufacturing processes and tools used.
- CO4. The course is delineated particularly to understand the conventional manufacturing processes like casting, metal forming, and welding process.

Course code	Course title	L	T	P	Credits
ME-305 C	HEAT TRANSFER	3	1	0	4

Course Objectives:

This course imparts basic knowledge of heat transfer and the knowledge imparted will enable him to reduce or increase heat transfer in existing equipment as the need may be and be able to go for preliminary design.

Course outcomes:

CO-1: To develop solutions for transient heat conduction in simple geometries, without heat generation.

CO-2: Understand the fundamentals of convective heat transfer process; evaluate heat transfer coefficients for natural and forced convection; deriving and analysing momentum and energy equations in two dimensions.

CO-3: Analysis of dimensionless quantities of heat transfer.

CO-4: Upon completion of this course, the students can able to understand and apply different heat and mass transfer principles of different applications.

CO-5. Students can able to understand the various heat transfers and also the Heat exchangers.

Course code	Course title	L	T	P	Credits
ME-307C	SOLID MECHANICS	3	1	0	4

Course Objectives:

The strength of materials is one of the core subjects and aim is to provide a sound foundation to design various elements.

Course outcomes:

1. Learn about the elastic and plastic behavior of material and evaluate stress invariants, principal stresses and their directions.
2. Determine strain invariants, principal strains and their directions.
3. Develop constitutive relationships between stress and strain for linearly elastic solid.
4. Analyze theories of failure and design components for safe operation.
5. Examine the properties of ideally plastic solid and apply the concepts of energy methods in solving structural problems.

Course code	Course title	L	T	P	Credits
ME-309 C	DESIGN OF MACHINE ELEMENTS	3	1	0	4

Course Objectives:

The objectives are to study characteristics of principle types of mechanical elements under variable loading and to predict their failure.

Course outcomes:

- CO1. Gain knowledge of Steady Stresses and Variable Stresses in Machine Members.
- CO2. Study characteristics of Temporary and Permanent Joints and analyze simple joints.
- CO3. Upon completion of this course, the students can able to successfully design machine components
- CO4. To inculcate an ability to design belt drives and selection of belt, rope and chain drives
- CO5. To achieve an expertise in design of Sliding contact bearing in industrial applicatio

Course code	Course title	L	T	P	Credits
ME-351 C	DYNAMICS OF MACHINES LAB	0	0	2	1

Course Objectives:

To understand how certain measuring devices are used for dynamic testing.

1. .

Course outcomes:

CO1.Ability to demonstrate the principles of kinematics and dynamics of machinery.

CO2.Ability to use the measuring devices for dynamic testing.

CO3. To equip the student with fundamental knowledge of dynamics of machines so that student can appreciate problems of dynamic force balance, transmissibility of forces, isolation of systems, vibrations.

CO4. Develop knowledge of analytical and graphical methods for calculating balancing of rotary and reciprocating masses.

CO5. Understand balancing of reciprocating and rotary masses.

Course code	Course title	L	T	P	Credits
ME-353 C	MANUFACTURING TECHNOLOGY LAB	0	0	2	1

Course Objectives:

To Study and acquire knowledge on various basic machining operations in special purpose machines and its

Course outcomes:

1. Students will understand lathe and its working
2. Students will get aware about different tools used in manufacturing.
3. Student will understand the concept of tool wear.
4. Students will learn the use of machineries.
5. Students will learn the different methods of manufacturing

Course code	Course title	L	T	P	Credits
ME-355 C	HEAT TRANSFER LAB	0	0	2	1

Course Objectives:

To study the heat transfer phenomena predict the relevant coefficient using implementation. To study the perform

Course outcomes:

- Ability to demonstrate the fundamentals of heat and predict the coefficient used in that transfer application and also design refrigeration cycle.
- Students can apply their heat transfer knowledge in industries.
- Analyze different methods to calculate the heat transfer coefficient in various heat transfer problems.
- Analyze the theoretical knowledge and apply it in conducting experiments in the forms of heat transfer
- Test Emissivity, Stefan Boltzmann Constant and Critical Heat flux. Asses the performance of Refrigeration and Air conditioning and to determine the overall heat transfer coefficient for a composite slab.

(VI SEMESTER)

Course code	Course title	L	T	P	Credits
ME-302C	COMPUTER INTEGRATED MANUFACTURING	3	0	0	3

Course Objectives:

- Students will be introduced to CAD/CAM/CAE concepts.
- Student will learn steps in upgrading from FMS to CIM.
- Students will learn about importance of data generation and management in CIMS.

Course outcomes:

CO1.Students will be able to apply knowledge about various methods of communication in CIMS

CO2.Students will be able to apply knowledge about Computer Aided Quality control and Process Planning Control.

CO3.Students will be able to apply knowledge about Computer Aided Quality control and Process Planning Control.

CO4. Students will be able to Design Flexible manufacturing cell after carrying out Group technology study and finally creating FMS.

CO5. To design a system, components, or process and meet specific objectives keeping in view the economical approaches, availability of materials and manufacturability with increased life.

Course code	Course title	L	T	P	Credits
MES-304C	PLC for Automation	4	0	0	4

Course Objectives:

To learn the basic concepts of PLC
 Learning of ladder programming for PLC

Course outcomes:

- | | |
|----|---|
| 1. | Configure the I/O for a PLC project using PLC software |
| 2. | Restore and monitor a PLC processor file using PLC programming software. Identify the basic components of the PLC and how they function |

MES-306C	IOT for Smart Manufacturing	L T P	Cr
		4 0 0	4

Course Objectives:

- To understand and have a clear vision to IOT. Data and Knowledge Management and use of Devices in IOT Technology. To build State of the Art architecture
- Application of IOT in real world, understand IOT Design Constraints and Industrial Automation. To meet the evolving IOT industry needs by addressing the challenges in Security in IOT, Integration of large scale heterogeneous network, Integration and interaction of uncertain data, and Service adaptation in the dynamic system environment.

Course outcome:

CO1. Students are encouraged to do Real Time Projects related to IOT based on above Course Learning and Understanding.

CO2. The students will be thorough about the technology behind the IOT and associated technologies.

CO3. The students will be able to use the IOT technologies in practical domains of society.

CO4. The students will be able to gain knowledge about the state of the art methodologies in IOT application domains.

CO5. Energy Efficiency and Cost Savings with IOT

MES-308C	Python for Automation	L-T-P	Credit
		4-0-0	4

Course outcome

CO1. Explain basic principles of Python programming language

CO2. Implement object-oriented concepts,

CO3. Implement database and GUI applications.

CO4. Students will be able to develop the skill of designing Graphical user Interfaces in Python

CO5. To develop the ability to write database applications in Python

MES-310C	Industry 4.0	L-T-P	Credit
		3-0-0	3

Learning Objectives

This course is designed to offer learners an introduction to Industry 4.0, its applications in the business world. Learners will gain deep insights into how smartness is being harnessed from data and appreciate what needs to be done in order to overcome some of the challenges.

Course Outcomes

1. Understand the journey of Industry 4.0 and its drivers, enablers and roadmap.
2. Appreciate the smartness in smart factories, smart manufacturing, smart products, smart services and smart cities,
3. Able to understand various technologies associated with industry 4.0.
4. Understand the opportunities, challenges and future skills required for Industry 4.0.
5. Appreciate the power of Cloud Computing in a networked economy

Course code	Course title	L	T	P	Credits
ME-352C	COMPUTER INTEGRATED MANUFACTURING LAB	0	0	2	1

Course Objectives:

The objective of this lab to introduce computerized manufacturing systems to the students. To expose the students to the

Course outcomes:

1.	Design and validate technological solutions to defined problems and communicate clearly and effectively for the practical application of their work.
2.	Review and document the knowledge developed by scholarly predecessors and critically assess the relevant technological issues
3	Students will be able to apply knowledge about Computer Aided Quality control and Process Planning Control
4	Students will be able to Design Flexible manufacturing cell after carrying out Group technology study and finally creating FMS
5	To develop habit of individual critical thinking in analyzing a complex problem in the computer aided designing, manufacturing and optimization.

Course code	Course title	L	T	P	Credits
ME-354C	Automation Lab	0	0	2	1

Course code	Course title	L	T	P	Credits
ME-356C	IoT for smart manufacturing Lab	0	0	2	1

MES-358C	Python Prog. Lab	L-T-P	Credits:1
		0-0-2	

List of Experiments

SYSTEM REQUIREMENTS:

Hardware Requirement:

(VII SEMESTER)

Course code	Course title	L	T	P	Credits
MER- 403 B	INDUSTRIAL ROBOTS	4	0	0	4

Course Objectives:

To impart knowledge on numerical methods to find the numerical solution of the problems that arise in engineering and to
 To familiarize the advanced mathematical methods to solve engineering research problems.

Course outcomes:

1.	Acquire more knowledge in basic concept of engineering mathematics.
2.	Improvement in problem evaluation technique.
3	Choose an appropriate method to solve a practical problem
4	Upon completion of this course, the students can able to apply the basic engineering
5	To learn about application of robot

MES 403B	SMART MANUFACTURING SYSTEMS	L T P	Cr
		4 0 0	4

Course Objectives:

- To understand the basics of smart manufacturing systems in context of Industry 4.0
- To understand the Architecture of Cyber- Physical system (CPS)
- Overall brief description of some associated technologies of smart manufacturing systems
- To understand IoT connectivity for Industry 4.0

On successful completion of this course, the students should be able to:

- Have a knowledge of smart manufacturing systems' components and can handle it more effectively.in context of Industry 4.0
- After understanding the Architecture of Cyber- Physical system (CPS) they can make machines more oriented towards Industry 4.0, which increases productivity
- Overall brief description of associated technologies of smart manufacturing systems enhance their workability knowledge in the industries

Course Code	Course title	L	T	P	Credits
MES-405B	ADDITIVE MANUFACTURING	4	0	0	4

Course Objectives	
1.	Additive Manufacturing (AM) is an economically viable alternative to conventional manufacturing technologies for producing highly complex parts.
2.	The objective of the course is to impart fundamentals of additive manufacturing processes along with the various file formats, software tools, processes, techniques and applications.
3.	The main objective of this course is to acquaint students with the concept of AM, various AM technologies, selection of materials for AM, modeling of AM processes, and their applications in various fields.

Course Outcomes:

1.	Students will be able to decide between the various trade-offs when selecting AM processes, devices and materials to suit particular engineering requirements.
2.	Students will have in-depth knowledge in latest trends and opportunities in AM, including distributed and direct digital manufacturing, mass customization, and how to commercialize their ideas.
3	Students will demonstrate a basic technical understanding of the physical principles, materials, and operation of the types of AM processes
4	Students will demonstrate the ability to identify characteristics of parts that are fabricated by AM processes
5	Explain the processes used in additive manufacturing

MES- 407 B	Smart Sensors for Automation	4	0	0	4
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Course Objectives:

- To makes students familiar with the constructions and working principle of different types of sensors.
- To make students aware about the measuring instruments and the methods of measurement and the use of different sensors in automation.

Course outcomes:	
1.	Use concepts in common methods for converting a physical parameter into an electrical quantity
2.	Classify and explain with examples of transducers, including those for measurement of temperature, motion and gas
3	Choose proper sensor comparing different standards and guidelines to make sensitive measurements of physical parameters like pressure, flow, acceleration, etc

Course code	Course title	L	T	P	Credits
MES-455B	ADDITIVE MANUFACTURING LAB	0	0	4	1

Course Objectives:

Students will gain a practical knowledge of various manufacturing processes in a hands-on environment through experiential learning.

Course outcomes: At the end of the course, a student will be able to:	
1	Study cutting forces in machining processes
2	Develop a practical understanding of advanced manufacturing processes.
3	Identify and rectify defects in parts and manufacturing processes related problems.
4	Simulate flow of molten polymer materials to identify the problems in injection moulding Processes.
5	Additive manufacturing allows the creation of lighter, more complex designs that are too difficult or too expensive to build using traditional dies, molds, milling and machining.

Text Books:

Course code	Course title	L	T	P	Credits
MES 459 B	AUTOMATION LAB-II	0	0	4	1
Course Objectives:					
Students will gain a practical knowledge of various Automation systems and IoT					

Course outcomes: At the end of the course, a student will be able to:	
1	Knowledge of Pneumatic systems
2	Knowledge of Hydraulic systems
3	Knowledge of IoT applications in Home Automation

(VIII SEMESTER)

Course code	Course title	L	T	P	Credits
ME-406C	INTERNSHIP	0	0	32	16

Course code	Course title	L	T	P	Credits
ME-402C	Online Mode -MOOC	3	0	0	3

Department of Mechanical Engineering

Syllabus

First Year

For

M.Tech. – Mechanical Engineering(2021-22)

ME-501	Simulation, Modelling & Analysis	L- T- P	Cr
		3- 1 - 0	4

OBJECTIVE: The students are provided with an opportunity to acquire deeper knowledge of quality and to control quality in industry by using inspection, control charts and acceptance sampling techniques.

Course Outcome
CO1:- Given a set process data, characterize the process behavior using descriptive statistics
CO2:- Given sampled process data over time, establish control charts for monitoring processes
CO3:- Identify if the process is in control. If not, identify special patterns that may exist
CO4:- Given a process that is in control and the process specification, identify if a process is capable
CO5:- Given a measurement system, design a plan to identify if the measurement system is capable

AM-501	Advanced Engineering Mathematics	L- T- P	Cr
		3- 1 - 0	4

ME-503	Advanced Heat & Mass Transfer	L- T- P	Cr
		3- 1 - 0	4

CO 1-Students will be able to understand basic knowledge of the definition and the fundamental concepts of fluid mechanics including continuum, velocity field, surface tension, flow visualization etc.

CO 2-Students will able to apply the basic equation of fluid statics to determine forces on planer and curved surfaces that are submerged in a static fluid.

CO 3-Students will able to use conservation laws in integral form and apply them to determine forces and moments on surfaces of various shapes and simple machines

CO 4-Students will able to use Euler's and Bernoulli's equations and the conservation of mass to determine velocities, pressures, and accelerations for incompressible and in viscid fluids

CO 5- Students will able design simple pipe systems to deliver fluids under specified conditions and also the loosed during the flow of the fluid.

ME- 505	CAD/CAM	L- T- P	Cr
		3- 1 - 0	4

CO 1-Students will be able to understand basic knowledge of the definition and the fundamental concepts of fluid mechanics including continuum, velocity field, surface tension, flow visualization etc.

CO 2-Students will able to apply the basic equation of fluid statics to determine forces on planer and curved surfaces that are submerged in a static fluid.

CO 3-Students will able to use conservation laws in integral form and apply them to determine forces and moments on surfaces of various shapes and simple machines

CO 4-Students will able to use Euler's and Bernoulli's equations and the conservation of mass to determine velocities, pressures, and accelerations for incompressible and in viscid fluids

CO 5- Students will able design simple pipe systems to deliver fluids under specified conditions and also the loosed during the flow of the fluid.

RM-501	Research Process And Methodology	L- T- P	Cr
		3- 1 - 0	4

CO 1-Students will be able to understand basic knowledge of the definition and the fundamental concepts of fluid mechanics including continuum, velocity field, surface tension, flow visualization etc.

CO 2-Students will able to apply the basic equation of fluid statics to determine forces on planer and curved surfaces that are submerged in a static fluid.

CO 3-Students will able to use conservation laws in integral form and apply them to determine forces and moments on surfaces of various shapes and simple machines

CO 4-Students will able to use Euler's and Bernoulli's equations and the conservation of mass to determine velocities, pressures, and accelerations for incompressible and in viscid fluids

CO 5- Students will able design simple pipe systems to deliver fluids under specified conditions and also the loosed during the flow of the fluid.

ME-502	Statistical Quality Control	L- T- P	Cr
		3- 1 - 0	4

OBJECTIVE: The students are provided with an opportunity to acquire deeper knowledge of quality and to control quality in industry by using inspection, control charts and acceptance sampling techniques.

Course Outcome
CO1:- Given a set process data, characterize the process behavior using descriptive statistics
CO2:- Given sampled process data over time, establish control charts for monitoring processes
CO3:- Identify if the process is in control. If not, identify special patterns that may exist
CO4:- Given a process that is in control and the process specification, identify if a process is capable
CO5:- Given a measurement system, design a plan to identify if the measurement system is capable

ME-504	Advanced Mechanics of Solids	L- T- P	Cr
		3- 1 - 0	4

Course Outcomes:	
1.	Students will be able to decide between the various trade-offs when selecting AM processes, devices and materials to suit particular engineering requirements.
2.	Students will have in-depth knowledge in latest trends and opportunities in AM, including distributed and direct digital manufacturing, mass customization, and how to commercialize their ideas.
3	Students will demonstrate a basic technical understanding of the physical principles, materials, and operation of the types of AM processes
4	Students will demonstrate the ability to identify characteristics of parts that are fabricated by AM processes
5	Explain the processes used in additive manufacturing

ME-506	Power Plant Engineering	L- T- P	Cr
		3- 1 - 0	4

OUTCOMES:

Upon the completion of this course the students will be able to

CO1 Explain the layout, construction and working of the components inside a thermal power plant.

CO2 Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants. CO3 Explain the layout, construction and working of the components inside nuclear power plants.

CO4 Explain the layout, construction and working of the components inside Renewable energy power plants.

CO5 Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.

ME-506	Power Plant Engineering	L- T- P	Cr
		3- 1 - 0	4

OUTCOMES:

Upon the completion of this course the students will be able to

CO1 Explain the layout, construction and working of the components inside a thermal power plant.

CO2 Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.

CO3 Explain the layout, construction and working of the components inside nuclear power plants.

CO4 Explain the layout, construction and working of the components inside Renewable energy power plants.

CO5 Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production

ME-601	Smart Manufacturing Systems	L- T- P	Cr
		3- 1 - 0	4

Course Outcomes:

On successful completion of this course, the students should be able to:

- Have a knowledge of smart manufacturing systems' components and can handle it more effectively.in context of Industry 4.0
- After understanding the Architecture of Cyber- Physical system (CPS) they can make machines more oriented towards Industry 4.0, which increases productivity
- Overall brief description of associated technologies of smart manufacturing systems enhance their workability knowledge in the industries
- After understanding IoT connectivity for Industry 4.0 they are able to make a system Taylor made as per requirement of the industry

Eventually knowledge of smart manufacturing systems enhances their employability opportunities as a whole

ME-603	Finite Element Method	L- T- P	Cr
		3- 1 - 0	4

Course Outcomes:

1.	Students will be able to decide between the various trade-offs when selecting AM processes, devices and materials to suit particular engineering requirements.
2.	Students will have in-depth knowledge in latest trends and opportunities in AM, including distributed and direct digital manufacturing, mass customization, and how to commercialize their ideas.
3	Students will demonstrate a basic technical understanding of the physical principles, materials, and operation of the types of AM processes
4	Students will demonstrate the ability to identify characteristics of parts that are fabricated by AM processes
5	Explain the processes used in additive manufacturing

ME-605	Production Planning and Control	L- T- P	Cr
		3- 1 - 0	4

Objectives:	<ol style="list-style-type: none"> To provide students knowledge about various types of productions like job, batch, continuous etc To introduce students to sales, operations, production and distribution resourceplanning To enable the students acquire the knowledge of value analysis, value engineering and break even analysis To teach students about various types of controls toward inventory planning
Outcome:	Student will be able to <ol style="list-style-type: none"> Identify and suggest correct type of production planning technique Analyze the concepts of production planning Control and implement in crucial areas of the industry

ME-617	Mechanical Engineering Lab-III	L- T- P	Cr
		0- 0 - 4	2

ME5E12	Vibration Engineering	L- T- P	Cr
		3- 0 - 0	3

Course Outcomes:	
1.	Students will be able to decide between the various trade-offs when selecting AM processes, devices and materials to suit particular engineering requirements.
2.	Students will have in-depth knowledge in latest trends and opportunities in AM, including distributed and direct digital manufacturing, mass customization, and how to commercialize their ideas.
3	Students will demonstrate a basic technical understanding of the physical principles, materials, and operation of the types of AM processes
4	Students will demonstrate the ability to identify characteristics of parts that are fabricated by AM processes
5	Explain the processes used in additive manufacturing

ME5E14	Smart Sensors	L- T- P	Cr
		3- 0 - 0	3

Course outcomes:
Use concepts in common methods for converting a physical parameter into an electrical quantity
Classify and explain with examples of transducers, including those for measurement of temperature, motion and gas
Choose proper sensor comparing different standards and guidelines to make sensitive measurements of physical parameters like pressure, flow, acceleration, etc

ME5E16	Industrial Robots	L- T- P	Cr
		3- 0 - 0	3

Course outcomes:	
1.	Acquire more knowledge in basic concept of engineering mathematics.
2.	Improvement in problem evaluation technique.
3	Choose an appropriate method to solve a practical problem

ME6E21	3-D printing/Additive Manufacturing	L- T- P	Cr
		3- 0 - 0	3

Course Outcomes:	
1.	Students will be able to decide between the various trade-offs when selecting AM processes, devices and materials to suit particular engineering requirements.
2.	Students will have in-depth knowledge in latest trends and opportunities in AM, including distributed and direct digital manufacturing, mass customization, and how to commercialize their ideas.

ME6E23	Properties & Selection of Engineering Materials	L- T- P	Cr
		3- 0 - 0	3

Course Outcomes:	
1.	Students will be able to decide between the various trade-offs when selecting AM processes, devices and materials to suit particular engineering requirements.
2.	Students will have in-depth knowledge in latest trends and opportunities in AM, including distributed and direct digital manufacturing, mass customization, and how to commercialize their ideas.
3	Students will demonstrate a basic technical understanding of the physical principles, materials, and operation of the types of AM processes
4	Students will demonstrate the ability to identify characteristics of parts that are fabricated by AM processes
5	Explain the processes used in additive manufacturing

ME-6E25	Industry 4.0	L-T-P	Credit
		3-0-0	3

. Pharmacy program outcome similar for all semesters

And specific outcome similar for all semesters

Only changes with course outcome:

Pattern follows for all even and odd semester

1. Pharmacy Knowledge: Possess knowledge of the core pharmacy subjects such as pharmaceutics, pharmacology, pharmaceutical chemistry and other allied subjects like pharmacy administration, cosmetics, marketing etc
2. 2. Planning Abilities: Showcase effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
3. 3. Problem analysis: Apply the scientific principles, analytical and critical thinking, while solving problems and making decisions during daily practice.
4. 4. Modern tool usage: Select, and apply appropriate procedures, resources, and modern pharmacy-related computing and analytical tools with an understanding of their working principles.
5. 5. Leadership skills: Inculcate leadership and team-building skills required for fulfilment of, professional and societal responsibilities. Undertake participatory roles as responsible citizens or leadership roles to facilitate improvement in health and wellbeing.
6. 6. Professional Identity: Comprehend, evaluate and communicate their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
7. 7. Pharmaceutical Ethics: Respect personal values and ethical principles in professional and social contexts. Apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
8. Communication: Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.

9. 9. The Pharmacist and society: Apply reasoning informed by the appropriate knowledge to assess health, safety and legal issues and following the responsibilities relevant to the professional pharmacy practice.
- 10.10. Environment and sustainability: Understand the impact of the professional pharmacy practices in environmental contexts, and showcase the knowledge of, and need for sustainable development.
11. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self- assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

Program specific outcome: for all Semesters similar for B.pharma course

PSO1. Understand the pharmacological and toxicological actions of synthetic and phytomolecules in the diagnosis, prevention, and treatment of various diseases.

PSO2. To emphasize the significance of quality control and assurance in drug design and formulation development.

PSO3. Implementing expertise in medicinal chemistry, preparative pharmacy, analytical skills, and pharmaceutical engineering in coming up with novel dosage forms as well as drug delivery skills to cater the needs of industry.

PSO4. Utilize the knowledge in drug laws for entrepreneurship development and marketing pertaining to drug distribution of all scheduled drugs and cosmetics.

Program outcome similar for all subjects:

PO - (Programmed Outcome) similar

1. Apply the basic knowledge gained in chemistry, anatomy, physiology, pathophysiology, and biochemistry and computer technology in pharmacy profession.
2. Develop required skills in formulation and dispensing in catering to patient needs as well as overcoming potential incompatibilities in formulations.
3. Ability to demonstrate and communicate ethical values with commitment to societal welfare.
4. To enhance the entrepreneurial capabilities for value added services and systems relating to community pharmacy and clinical trial setups.
5. To develop a sense of professional responsibility to be a medication dispenser and be able to master, generate, interpret and disseminate the knowledge of pharmacy practice.
6. Proper utility and regulation of marketed drugs and pharmaceuticals in patient care

Course Name	Course Outcomes	
B.Pharm 1st Sem		
Subject: Human Anatomy and Physiology – I – Theory /BP101T	CO1	Explain the gross morphology, structure and functions of various organs of the human body.
	CO2	Describe the various homeostatic mechanisms and their imbalances.
	CO3	Identify the various tissues and organs of different systems of human body.
	CO4	Perform the various experiments related to special senses and nervous system.
	CO5	Appreciate coordinated working pattern of different organs of

		each system
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Subject with code Pharmaceutical Analysis–I– Theory (BP102T)	CO1	Understand the principles of volumetric and electro chemical analysis
	CO2	Carryout various volumetric and electrochemical titrations
	CO3	Develop analytical skills
	CO4	It helps to develop the fundamentals of volumetric analytical skills.
	CO5	It peculates the basic knowledge in the principles of electrochemical analytical techniques

Subject: Pharmaceutics – I – Theory (BP103T)	CO1	Know the history of profession of pharmacy
	CO2	Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
	CO3	Understand the professional way of handling the prescription
	CO4	Preparation of various conventional dosage forms
	CO5	Preparation of and evaluation of dosage forms

Subject: Pharmaceutical Inorganic Chemistry– Theory BP104T	CO1	Know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
	CO2	Understand the medicinal and pharmaceutical importance of inorganic compounds
	CO3	Knowledge about the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
	CO4	understand the medicinal and pharmaceutical importance of inorganic compounds

	CO5	To have been introduced to a variety of inorganic drug classes.
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Subject: Communication Skills – Theory BP105T	CO1	Understand the behavioural needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
	CO2	Communicate effectively (Verbal and Non-Verbal)
	CO3	Effectively manage the team as a team player
	CO4	Develop interview skills
	CO5	Develop Leadership qualities and essentials

Subject:Remedi al Biology – Theory BP106RBT	CO1	Know the classification and salient features of five kingdoms of life.
	CO2	Know understand the basic components of anatomy & physiology animal with special reference to human
	CO3	Understand the basic components of anatomy & physiology of plant
	CO4	Theory of evolution
	CO5	Anatomy and Physiology of plants and animals

Subject: Remedial Mathematics – Theory BP106RMT	CO1	Know the theory and their application in Pharmacy
	CO2	Solve the different types of problems by applying theory
	CO3	Appreciate the important application of mathematics in Pharmacy
	CO4	Perform abstract mathematical reasoning
	CO5	

B.Pharmacy –II SEM

Subject: Human Anatomy and	CO1	Explain the gross morphology, structure and functions of various organs of the human body.
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Physiology – II – BP201T		
	CO2	Explain the gross morphology, structure and functions of various organs of the human body.
	CO3	Identify the various tissues and organs of different systems of human body.
	CO4	Perform the haematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc. and also record blood pressure, heart rate, pulse and respiratory volume
	CO5	Appreciate coordinated working pattern of different organs of each system

Subject: Pharmaceutical Organic Chemistry – I – Theory BP202T	CO1	Write the structure, name and the type of isomerism of the organic compound
	CO2	Write the reaction, name the reaction and orientation of reactions
	CO3	Account for reactivity/stability of compounds,
	CO4	Reactions mechanisms of an organic compounds
	CO5	Identify/confirm the identification of an organic compound

Subject: Biochemistry – Theory BP203T	CO1	Understand the catalytic role of enzymes, the importance of enzyme inhibitors in the design of new drugs, therapeutic and diagnostic applications of enzymes.
	CO2	Understand the metabolism of nutrient molecules in physiological and pathological conditions
	CO3	Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.
	CO4	To know the interpretation of data emanating from a Clinical

		Test Lab.
	CO5	To know how physiological conditions influence the structures and re -activities of biomolecules.

Subject: Pathophysiology – Theory BP204T	CO1	Describe the etiology and pathogenesis of the selected disease states;
	CO2	Name the signs and symptoms of the diseases; and 3. Mention the complications of the diseases.
	CO3	Identify the complications of the diseases.
	CO4	Know most commonly encountered pathophysiological state(s) and/or diseases
	CO5	Metabolic mechanism(s), as well as any clinical testing requirements

Subject: Computer Applications in Pharmacy– Theor	CO1	Know the various types of application of computers in pharmacy
	CO2	Know the various types of databases
	CO3	Know the various applications of databases in pharmacy
	CO4	Design and develop solutions to analyse.

BP205T	CO5	Apply the knowledge of mathematics and computing fundamentals to pharmaceutical applications for any given requirement
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Subject: Environmental Sciences – Theory BP206T	CO1	Create the awareness about environmental problems among learners.
	CO2	Impart basic knowledge about the environment and its allied problems
	CO3	Develop an attitude of concern for the environment.
	CO4	Motivate learner to participate in environment protection and environment improvement.
	CO5	Acquire skills to help the concerned individuals in identifying and solving environmental problems.

Subject: Pharmaceutical Organic Chemistry–II– BP301T	CO1	Write the structure, name and the type of isomerism of the organic compound
	CO2	Write the reaction, name the reaction and orientation of reactions
	CO3	Account for reactivity/stability of compounds,
	CO4	Prepare organic compounds
	CO5	Special emphasis on mechanisms and orientation of chemical reactions

B.PHARMACY -III SEM

Subject: Pharmaceutical Organic	CO1	Write the structure, name and the type of isomerism of the organic compound
	CO2	Write the reaction, name the reaction and orientation of reactions

Chemistry–II– BP301T	CO3	Account for reactivity/stability of compounds,
	CO4	Prepare organic compounds
	CO5	Special emphasis on mechanisms and orientation of chemical reactions
Subject: Physical Pharmaceutics – I – Theory BP302T	CO1	Understand various physicochemical properties of drug molecules in the designing the dosage form
	CO2	Know the principles of chemical kinetics & to use them in assigning expiry date for formulation
	CO3	Demonstrate the use of physicochemical properties in the evaluation of dosage forms.
	CO4	Appreciate physicochemical properties of drug molecules in formulation research and development
	CO5	Understand the physical properties of solutions, buffers, isotonicity, disperse systems and rheology.
Subject: Pharmaceutical Microbiology Theory – BP303T	CO1	Understand methods of identification, cultivation and preservation of various microorganisms
	CO2	Importance of sterilization in microbiology. and pharmaceutical industry.
	CO3	Learn sterility testing of pharmaceutical products.
	CO4	Microbiological standardization of Pharmaceuticals.
	CO5	Understand the cell culture technology and its applications in pharmaceutical industries.

Subject: Pharmaceutical Microbiology Theory – BP303T	CO1	Understand methods of identification, cultivation and preservation of various microorganisms
	CO2	Importance of sterilization in microbiology. and pharmaceutical industry.
	CO3	Learn sterility testing of pharmaceutical products.
	CO4	Microbiological standardization of Pharmaceuticals.
	CO5	Understand the cell culture technology and its applications in pharmaceutical industries.

Subject:Pharma ceu tical Engineering –	CO1	To know various unit operations used in Pharmaceutical industries.
	CO2	To understand the material handling techniques.
	CO3	To perform various processes involved in

Theory BP304T		pharmaceutical manufacturing process.
	CO4	To carry out various test to prevent environmental pollution.
	CO5	To appreciate and comprehend the significance of plant lay out a design for optimum use of resources.

B.PHARM –IV SEM

Subject: Pharmaceutica I Organic Chemistry – III – Theory BP401T	CO1	Understand the methods of preparation and properties of organic compounds
	CO2	Explain the stereo chemical aspects of organic compounds and stereo chemical reactions
	CO3	Know the medicinal uses and other applications of organic compounds
	CO4	To be able to run experimental techniques, procedures and safe laboratory practices.
	CO5	Stereo-chemical features including conformation and stereo electronic effects; Geometrical isomers
Subject: Medicinal Chemistry – I – Theory BP402T	CO1	Understand the chemistry of drugs with respect to their pharmacological Activity
	CO2	Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3	Know the Structural Activity Relationship (SAR) of a different class of drugs
	CO4	Write the chemical synthesis of some drugs
	CO5	Knowledge about the mechanism pathways of different class of medicinal compounds.
Subject: Physical Pharmaceutics – II – Theory BP403T	CO1	Understand various physicochemical properties of drug molecules in the designing the dosage form
	CO2	Know the principles of chemical kinetics & to use them in assigning expiry date for formulation
	CO3	Demonstrate the use of physicochemical properties in the evaluation of dosage forms.
	CO4	Appreciate physicochemical properties of drug molecules in formulation research and development
	CO5	Knowledge about the mechanism pathways of different class of medicinal compounds.
	CO1	Understand the pharmacological actions of different categories of drugs

Pharmacology – I – Theory BP404T	CO2	Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
	CO3	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
	CO4	Observe the effect of drugs on animals by simulated experiments
	CO5	Appreciate correlation of pharmacology with other bio medical sciences
Subject: Pharmacognosy – I – Theory BP405T	CO1	To know the techniques in the cultivation and production of crude drugs
	CO2	To know the crude drugs, their uses and chemical nature
	CO3	Know the evaluation techniques for the herbal drugs
	CO4	To carry out the microscopic and morphological evaluation of crude drugs
	CO5	. Knowledge about the mechanism pathways of different class of medicinal compounds.

B.PHARM -V SEM

Subject: Medicinal Chemistry – II – Theory BP501T	CO1	Understand the chemistry of drugs with respect to their pharmacological activity
	CO2	Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3	Know the Structural Activity Relationship of different class of drugs
	CO4	Study the chemical synthesis of selected drugs
	CO5	To acquire knowledge about the chemotherapy for cancer.
Industrial PharmacyI– Theory BP502T	CO1	Know the various pharmaceutical dosage forms and their manufacturing techniques.
	CO2	Know various considerations in development of pharmaceutical dosage forms
	CO3	Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality
	CO4	They know very well about orally administered drugs, injectables, aerosol and semisolid preparations with standard protocols
	CO5	Formulated drugs are stored in a suitable container closure system for extended periods of time.
Pharmacology II – Theory BP503T	CO1	Understand the mechanism of drug action and its relevance in the treatment of different diseases
	CO2	Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments
	CO3	Demonstrate the various receptor actions using isolated tissue

		preparation
	CO4	Appreciate correlation of pharmacology with related medical sciences
	CO5	They would have understood the cell communication mechanism
Pharmacognosy and Phytochemistry II– Theory BP504T	CO1	To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
	CO2	To understand the preparation and development of herbal formulation.
	CO3	To understand the herbal drug interactions
	CO4	To carryout isolation and identification of phytoconstituents
	CO5	. RelationsbetweenPhyto -therapy and the Elderly, Phytotherapy and Children, Understanding Herbal Action, and Understanding the MateriaMedica.
Subject: Pharmaceutica I Jurisprudence – Theory BP505T	CO1	The Pharmaceutical legislations and their implications in the development and marketing
	CO2	Various Indian pharmaceutical Acts and Laws
	CO3	The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
	CO4	The code of ethics during the pharmaceutical practice
	CO5	Awareness the pharmaceutical acts for industry and their regulations

B.PHARM -VI SEM

Medicinal Chemistry III – Theory BP601T	CO1	Understand the importance of drug design and different techniques of drug design
	CO2	Understand the chemistry of drugs with respect to their biological activity
	CO3	Know the importance of SAR of drugs
	CO4	Know the metabolism, adverse effects and therapeutic value of drugs
	CO5	To have been introduced to a variety of drug classes and some pharmacological properties

Subject: Pharmacology– III	CO1	Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases
	CO2	Comprehend the principles of toxicology and treatment of

BP602T		various poisonings
	CO3	Appreciate the correlation of pharmacology with related medical sciences
	CO4	They studied about symptoms of several poisonings
	CO5	They studied about treatment of several poisonings

Subject: Herbal Drug Technology-Theory- BP603T	CO1	Understand the raw material as a source of herbal drugs from cultivation to herbal drug product
	CO2	Know the WHO and ICH guidelines for evaluation of herbal drugs
	CO3	Know the herbal cosmetics, natural sweeteners, nutraceuticals
	CO4	Appreciate patenting of herbal raw material
	CO5	medicinal plants and derivatives for use in herbal, food and cosmetic products,

Biopharmaceutics and Pharmacokinetics –Theory BP604T	CO1	Understand the basics concepts of Biopharmaceutics & Pharmacokinetics
	CO2	Use plasma data and derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination.
	CO3	Critically desing the biopharmaceutic studies involving drug product equivalency.
	CO4	Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parametrs
	CO5	Determine the various pharmacokinetic parameters from either plasma concentration or urinary excretion data for drug

Pharmaceutical Biotechnology-Theory	CO1	Understanding the importanc of immobilized enzymes in pharmaceutical industries
	CO2	Genetic engineering applications in relation to production of pharmaceuticals

BP605T	CO3	Importance of monoclonal antibodies in industries
	CO4	Appreciate the use of microorganisms in fermentation technology
	CO5	Appreciate the use of microorganisms in fermentation technology

Pharmaceutical Quality Assurance-Theory-BP-606T	CO1	Understand the cGMP aspects of pharmaceutical industry
	CO2	appreciate the importance of documentation
	CO3	Understand the scope of quality certifications applicable to pharmaceutical industries
	CO4	Understand the responsibilities of QA & QC departments
	CO5	The process involved in manufacturing of pharmaceuticals different section/department and activity is learnt.

B.PHARM- VII SEM

BP701T Instrumental Methods of Analysis	CO1	Explain the principle, instrumentation and pharmaceutical applications of interactions of electromagnetic radiations with drugs
	CO2	Explain the principle, instrumentation and applications of vibrational spectrophotometric drug analysis
	CO3	Explain the principle and applications of chromatographic separation in drug analysis
	CO4	Explain the principle and applications of chromatographic separation in drug analysis
	CO5	Describe the principle, instruments and applications of gas and liquid chromatographic separation in drug analysis

Industrial Pharmacy-II	CO1	Describe the pilot plant scale up requirements, SUPAC guidelines, and platform technology
	CO2	Explain about the importance of WHO guidelines for

BP702T		Technology Transfer and technology transfer agencies in India
	CO3	Describe about the historical overview and responsibility of regulatory affairs department
	CO4	Explain the concepts of quality control, Quality by Design (QbD), ISO quality systems standards,
	CO5	Explain the organization, responsibilities and certification of Central

Pharmacy Practice BP703T	CO1	Describe the organizational set up of hospital, hospital pharmacy, community pharmacy and drug store inventory control
	CO2	Explain the process of monitoring, detecting and reporting adverse drug reactions
	CO3	Describe the functions of drug distribution system, therapeutic drug monitoring system and pharmacy and therapeutic committee
	CO4	Explain the importance of patient counselling and education and training program for pharmacists
	CO5	Perform interpretation of clinical laboratory tests

Novel Drug Delivery System BP704T	CO1	Explain the strategies for the development of controlled approaches, mucosal and implantable drug delivery approaches
	CO2	Describe the role of microencapsulation in the drug development
	CO3	Explain the strategies and applications of Transdermal, gastroretentive, ocular and nasopulmonary drug delivery approaches
	CO4	Explain the concepts and applications of liposomes, niosomes, nanoparticles, monoclonal antibodies for the targeted delivery
	CO5	Describe the development and applications of intra uterine devices

Instrumental Methods of Analysis BP705P	CO1	Estimate the amount of drugs present in the pharmaceutical products using colorimetric, UV visible and Fluorometric principles
	CO2	Determine the ions through flame photometry and nephelo turbidometry methods
	CO3	Separate and evaluate the natural products using paper, thin layer

	CO4	chromatography and column chromatography techniques
	CO5	Estimate the amount of drugs present in the pharmaceutical products using colorimetric, UV visible and Fluorometric principles

Practice School BP706PS	CO1	Carry out advanced experimental procedures in the drug development disciplines
	CO2	Explain the concepts of advanced drug design and development concepts
	CO3	Describe the advances in the areas of pharmacology, biotechnology and drug delivery systems
	CO4	Practice of project work preparation for industry oriented knowledge
	CO5	Development of skill for industry required technology

Practice School BP-706PS	CO1	Carry out advanced experimental procedures in the drug development disciplines
	CO2	Explain the concepts of advanced drug design and development concepts
	CO3	Describe the advances in the areas of pharmacology, biotechnology and drug delivery systems
	CO4	Practice of project work preparation for industry oriented knowledge
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	CO4	Practice of project work preparation for industry oriented knowledge
	CO5	Development of skill for industry required technology

	CO1	Explain the concept, scope and benefits of the generic drug product development
Social and Preventive Pharmacy BP802T	CO1	Explain the causes and evaluation of diseases and public health.
	CO2	Describe about the different drug regulatory approval agencies and drug approval process.
	CO3	Describe the preventive measures of life threatening diseases
	CO3	Explain about Drug Master Files (DMF), Common Technical Document (CTD), electronic Common immunization programs
	CO4	Technical Document (eCTD) and ASEAN Common Technical Document (ACTD) research
	CO5	Describe about the clinical trial development and immunization programs
Pharmaceutical Regulatory Science BP804ET	CO5	Explain the importance and execution of the Health promotion and pharmaco vigilance
	CO5	Explain the programs and functions of Orange book, Federal Register, Code of Federal Regulatory and Purple book

B. PHARMACY- VIII SEMESTER

Biostatistics and Research Methodology BP801T	CO1	Apply and explain the concepts and applications of
	CO2	Apply and explain the pharmaceutical applications of regression and parametric tests
	CO3	Explain the advanced
	CO4	Explain the clinical applications of statistical analysis software tools in the clinical development
	CO5	Describe the principle, methodology and applications of factorial

Social and Preventive Pharmacy BP802T	CO1	Explain the causes and evaluation of diseases and public health.
	CO2	Describe the preventive measures of life threatening diseases
	CO3	Explain the objectives and functions of national health and immunization programs
	CO4	Describe the objectives and role of WHO in national health and immunization programs
	CO5	Explain the importance and execution of the Health promotion and education programs in schools
Pharma Marketing Management BP803ET	CO1	Explain the concepts and role of pharmaceutical marketing strategies
	CO2	Describe the concepts and functions of product management
	CO3	Explain the importance and
	CO4	Describe the functions of pharmaceutical marketing channels
	CO5	Explain the functions of Drug Price Control Order and National Pharmaceutical Pricing Authority
Quality Control and Standardization of Herbals	CO1	1) Explain the quality control, quality assurance, storage and evaluation of herbal drugs
	CO2	Explain the role of chemical and biological markers in standardization of herbal products
	CO3	Explain the research guidelines for evaluating the safety and efficacy of herbal medicines

BP806ET	CO4	Explain the role of chemical and biological markers in standardization of herbal products.
	CO5	Describe the importance of stability testing in the evaluation of herbal medicines

Pharmaceutical Regulatory Science BP804ET	CO1	Explain the concept, scope and benefits of the generic drug product development
	CO2	Describe about the different drug regulatory approval agencies and drug approval process
	CO3	Explain about Drug Master Files (DMF), Common Technical Document (CTD), electronic Common Technical Document (eCTD) and ASEAN Common Technical Document (ACTD) research
	CO4	Describe about the clinical trial development and pharmacovigilance
	CO5	Explain the concepts and functions of Orange book, Federal Register, Code of Federal Regulatory and Purple book

Computer-Aided Drug Design BP807ET	CO1	1) Describe the concepts of drug discovery and design strategies
	CO2	2) Explain the principle and applications of quantitative-structure activity relationship (QSAR) in the lead optimization process
	CO3	3) Describe the virtual screening approaches and their applications in the drug discovery science
	CO4	4) Explain the principle and applications of molecular modeling techniques
	CO5	Describe the importance of bioinformatics analysis in the drug

Computer-Aided Drug Design	CO1	1) Describe the concepts of drug discovery and design strategies
	CO2	2) Explain the principle and applications of quantitative-structure activity relationship (QSAR) in the lead optimization process

BP807ET	CO3	3) Describe the virtual screening approaches and their applications in the drug discovery science
	CO4	4) Explain the principle and applications of molecular modeling techniques
	CO5	Describe the importance of bioinformatics analysis in the drug

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	CO4	Explain the principle and applications of molecular modeling techniques
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	CO2	Explain the principle and applications of quantitative-structure activity relationship (QSAR) in the lead optimization process
	CO3	Describe the virtual screening approaches and their applications in the drug discovery science
	CO4	Explain the principle and applications of molecular modeling techniques
	CO5	Describe the importance of bioinformatics analysis in the drug

Cosmetic Science	CO1	Explain the evolution, types and applications of cosmetic products
	CO2	Explain the principle and formulations aspects of skin and hair care products

BP809ET	CO3	Describe the benefits of herbal cosmetics
	CO4	Explain the analytical methods for the evolution of cosmetic products
	CO5	Explain the mechanism of action and problems of cosmetic products

Pharmacological screening methods BP810ET	CO1	Explain the CPCSEA and OECD guidelines for maintenance, breeding and conduct of experiments on laboratory animals
	CO2	Describe the techniques for collection of blood and common routes of drug administration in laboratory animals,
	CO3	Explain the rationale for selection of preclinical models
	CO4	Demonstrate the various screening methods used in preclinical research
	CO5	Describe the tools used in the for the pre-clinical data analysis and

Advanced Instrumentation Techniques BP811ET	CO1	Explain the principle, instrumentation and applications of NMR and mass spectroscopy methods in the drug analysis and drug discovery
	CO2	Explain the principle, instrumentation and applications of thermal and X-ray diffraction methods in the drug analysis and drug discovery
	CO3	Describe the ICH and USFDA guidelines for the calibration and validation of instruments
	CO4	Explain the principle, instrumentation and applications of radio immune assay in the drug analysis and drug discovery
	CO5	Explain the principle, instrumentation and applications of

Pharmaceutical Product Development BP812 ET	CO1	1) Explain the objectives, regulations and stability assesment aspects related to preformulation
	CO2	2) Describe the role of pharmaceutical excipients in pharmaceutical product development
	CO3	3) Describe

	CO4	4) Explain the objectives and applications of optimization techniques in pharmaceutical product development
	CO5	5) Describe the quality control testing of packaging materials



LINGAYA'S VIDYAPEETH
(A Deemed to be University u/s 3 of UGC Act, 1956)

Approved by MHRD/UGC/AICTE/PCI/BCI/COA/NCTE Government of India

(NAAC Accredited)

SCHOOL OF COMMERCE & MANAGEMENT

Learning Outcomes-based Curriculum Framework

For
Commerce

BMI- 2021-26

BMI-2021-26

Vision, Mission and Core Values of the Vidyapeeth

Vision

Traditionally believing that God is the Source of all Truth, Goodness and Beauty, Lingaya's Vidyapeeth, wishes to develop in students a wisdom that translates academic achievements into responsible citizenship, sincere professional service and a deep respect for life and beauty in God's Creation and Recreation.

Mission

1. To impart knowledge and skills in the field of Engineering/ Technology, Management, Education, Science & Arts and related areas;
2. To dedicate itself for improvement of social and economic status and enhancement of the quality of life for all;
3. To strive for maximizing human welfare through education;
4. To produce effective knowledge workers, practitioners and educators who will be guided by vision, compassion, knowledge, discipline, discovery with deep respect for human values;
5. To provide an individual engineering and other professional learning experience for each student;
6. To develop critical thinking, analytical ability and creative skills;
7. To supplement the curricula, team work, leadership, communication skills, project management, social concerns and ethics and
8. To establish interaction with industries for Technology, Research & Development.

In line with above vision and mission statements, Lingaya's Vidyapeeth has the following special characteristics:

- Lingaya's Vidyapeeth is an Institution for providing a student with opportunity

for all round development and education with the aim of effectively living as a good citizen

- It has special strength in the field of Engineering and Technology with emphasis on practice and problem solving skills.
- Its activities and course curriculum concentrate on design, self-learning and research, which are the unique features of the Vidyapeeth.
- The primary value of knowledge and skill imparted by Lingaya's Vidyapeeth resides in its utility in creating an infrastructure for the physical welfare of the general public, in sustaining good health of individuals and the community.
- Lingaya's Vidyapeeth facilitates and promotes creativity and critical thinking capabilities in its students.
- The education in Lingaya's Vidyapeeth enhances the inherent capacity of a student with honesty, courage and fairness.

Vision and Mission of the School

Vision of School

To be a school committed to develop globally competent management professions who are responsible citizens and have respect for life and sensitivity towards the environment

Mission of School

1. To develop managers and leaders who have the right attitude and aptitude to serve the society.
2. To develop and maintain state-of-the-art infrastructure and research facilities to enable, create, apply and disseminate knowledge
3. To foster linkages with all stakeholders for continuous improvement in academics in management.
4. To develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders can emerge who have deep respect for human life and value.

Programme Educational Objectives (PEO)

PEO1: Develop into socially responsible and value driven people who are committed to long term development.

PEO2: To make managerial decisions, develop a creative, imaginative and entrepreneur mentality.

PEO3: Ability to adapt to a rapidly evolving, dynamic market climate and a desire to learn new skills.

PEO4: Provide advanced management skills for work and lifelong learning.

Mapping of PEOs with Mission Statements

BBA 2022 - 2025

PEO Statements	School Mission 1	School Mission 2	School Mission 3	School Mission 4
PEO1:	2	2	1	2
PEO2:	3	2	-	1
PEO3:	1	2	2	-
PEO4:	2	3	2	1

Program Outcomes (PO's)

PO1- Business environment and domain knowledge: Accounting, Finance, Corporate Laws, Auditing and Taxation are all areas in which students should be well-versed.

PO2- Critical thinking, business analysis, Problem Solving and Innovative Solutions: Identify, formulate, and analyze business issues in order to draw long-term conclusions based on results.

PO3- Global Exposure and Cross-Cultural Understanding: Refresh students' awareness on how to adopt global business practices.

PO4 – Social Responsiveness and Ethics: Incorporate social responsiveness and professional ethics into business management strategies and adhere to them.

PO5- Effective Communication: Communicate with all stakeholders effectively. Graduates should be able to communicate effectively both orally and in writing.

PO6- Life Long Learning: Prepare for post-graduate and higher education, as well as professional success.

PSO's:-

PSO1 – Achieve a solid foundation in the field of finance and accounting.

PSO 2 - Possess adequate knowledge skills and experiential learning in area of commerce education

Mapping of Program Outcome with Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4
PO1	1	3	2	3
PO2	1	3	2	2
PO3	1	2	3	2
PO4	3	1	2	1
PO5	1	1	2	2
PO6	1	2	3	2
PSO 1	1	3	2	2
PSO 2	1	2	1	2

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

School: School of Commerce and Management							Batch: 2021-26						
Department: School of Commerce and Management							Year: 5						
Course: BBA-MBA Integrated							Semester: IX						
S N	Cate- gory	Cours e Code	Course Name	Periods			Cre dits	Evaluation Scheme					S u b j e c t T o t a l M a r k s
				L	T	P		Theo ry			Practic al		
								A B Q	M S E	E S E	I P	EX P	
1	PROJ	BMI- 551	Major Project	-	-	30	15					100	1 0 0
			Total		-	30	15						

Abbreviations:			
PROJ:	PROJ:	Project	Assignment Based Quiz
L:	Lecture	MSE:	Mid Semester Examination
T:	Tutorial	ESE:	End Semester Examination
P:	Practical	BMI:	BBA MBA Integrated
EXP:	External Practical		



BACHELOR OF COMMERCE (HONOURS)

First to Sixth Semester

(w.e.f. 2021- 2022 Academic Session)

Programme Educational Objectives (PEO)

PEO1 To produce employable graduates in the areas of business, commerce and allied areas.

PEO2 : To pursue higher education

PEO3: To develop entrepreneurial skills to enable students to be self-employed/entrepreneurs.

PEO4: To inculcate business ethics and social responsibility.

Mapping of PEOs with Mission Statements

PEO Statements	School Mission 1	School Mission 2	School Mission 3	School Mission 4
PEO1:	2	2	1	2
PEO2:	3	2	1	1
PEO3:	1	2	2	3
PEO4:	2	3	2	1

Program Outcomes

(PO's) PO1- Knowledge of Business and Commerce.

PO2- Knowledge and ability to pursue higher education.

PO3- Ability to identify problems and collect relevant data.

PO4 – Ability to understand and use modern tools and technologies.

PO5- Understanding the impact of commercial activities on environment and sustainability.

PO6- Apply ethical principles in business and commerce.

PO7- Ability to effectively communicate in a business environment.

PO8- Ability to perform effectively as a leader as well as a member of a team.

PO9- Ability to engage in lifelong and progressive learning.

Mapping of Program Outcome with Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4
PO1	3	3	2	2
PO2	2	3	-	-
PO3	1	2	2	-
PO4	2	2	1	-
PO5	1	1	3	1
PO6	2	1	1	3
PO7	2	2	3	2
PO8	1	-	2	2
PO9	2	2	1	1
PSO 1	1	3	2	2
PSO 2	1	2	1	2



SEMESTER I

MG-101

BUSINESS STATISTICS

L-T-P: 4-0-0

Course Outcome

CO1: To familiarize the concept of statistics.

CO2: To provide practical exposure on calculation of measures of average. CO3: To introduce the students about the concept of Probability.

CO4: To provide a glimpse of business trends and projections.

CO5: To provide practical exposure on calculation of measures of correlation and regression.

CO6: To provide practical exposure on calculation of trend analysis.

Unit Wise Syllabus

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3	1	-	-	-	-	-	-	-
CO 2	-	1	2	2	-	-	-	-	-
CO 3	3	2	-	-	-	-	-	-	-
CO 4	2	2	1	-	-	-	-	-	-
CO 5	1	1	2	2	-	-	-	-	-
CO 6	-	1	3	2	-	-	-	-	-

MG-103
4- 0-0

FINANCIAL MANAGEMENT

L-T-P:

Course Outcome

CO1: Explain time value, risk, and return concepts.

CO2: Apply techniques for estimating the cost of capital and understand sources of finance.

CO3: Construct the management corporate leverage and capital structure.

CO4: Identify Working capital requirement and components.

CO5: Interpret the Capital budgeting process and techniques.

Unit Wise Syllabus

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	2	1	-	1	-	-	-	1
CO2	2	3	2	-	1	-	1	-	1
CO3	2	2	3	-	1	-	-	-	1
C04	3	2	1	1	-	-	1	-	1
CO5	2	2	1	1	-	-	1	-	1

MG-105

BUSINESS ECONOMICS

L-T-P: 4-0-0

Course Outcome

CO1: Discuss the basics concepts, scope and importance of economics.

CO2: Analyze the law of demand and supply.

CO3: Analyze the law of Diminishing Marginal Utility, Equip marginal Utility, Curve Law of Variable Proportion and Laws of Returns to Scale

CO4: Formulate different product pricing based on the different markets condition and illustrate different markets.

CO5: Summarize the nature and principles of Public Expenditure and Public Finance criticize the basic problems in the national income.

Unit Wise Syllabus

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	-	-	-	1	1	-	-	2
CO2	2	2	-	-	1	1	2	-	2
CO3	2	2	-	-	2	1	1	-	2
CO4	1	2	-	-	2	2	2	-	3
CO5	2	-	2	-	2	1	1	-	2

CS-107 COMPUTER APPLICATIONS FOR BUSINESS

L-T-P: 3-0-0

Course Outcome

CO1: Explain the features of computer generation, CPU, input and output devices.

CO2: Illustrate System software, system software packages and functions of Operating Systems.

CO3: Infer Network, Network Topology, LAN, WAN, MAN and Network devices.

CO4: Prepare flowcharts and understand advantages and limitations of flow charts.

CO5: Apply E-mail concepts.

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	1	1	-	1	-	-	-	-	-
CO 2	-	1	-	-	-	-	-	-	-
CO 3	3	1	-	2	-	-	1	1	-
CO4	3	-	1	-	-	-	-	-	1
CO 5	3	2	1	1	-	1	2	-	1

BL-111

BUSINESS LAW

L-T-P: 3-0-0

Course Outcome

CO1: Explain essentials of Contract, performance and breach of Contract under Indian Contract Act 1872.

CO2: Interpret necessary formalities of contract of sale and rights of unpaid seller under the Sale of Goods Act 1930.

CO3: Explain the essentials of partnership, rights and duties of partners under Partnership Act 1932.

CO4: Summarize the effects of dishonor of negotiable instruments under Negotiable Instruments Act 1881.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	1	-	-	-	1	1	-	1
CO2	2	1	-	-	1	1	1	-	1
CO3	2	1	-	-	-	1	1	-	1
CO4	3	1	-	-	1	1	1	-	1



SEMESTER- II

BACHELOR OF COMMERCE (B.com)

MG166: Social Service

BACHELOR OF COMMERCE (B.com)

L-4, T/P-0,

MG-104: Business Taxation

Credits:

04

Course Outcome

CO1 Describe the provisions and objective of tax system in India.

CO2 Paraphrase the concepts of central excise duty.

CO3 Abridge the concept of customs duty.

CO4 Exemplify the provisions and importance of Sales tax Act.

CO5 Articulate the fundamentals concepts of value added tax.

CO6 Demonstrate insight into the basic concepts of business taxation and enable them to learn

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	3	2	2	1	-	1	1	-	1
CO 2	2	2	2	2	1	2	2	-	1
CO 3	2	1	3	1	-	2	3	-	1
C04	3	1	1	2	1	1	1	-	1

MG-102

Indian Economy

L-T-P: 4-0-0

Course Outcomes:

CO1: Explore national income and capital formation.

CO2: Rate economic growth and development.

CO3: Inspect the new economic reforms

CO4: Translate and relate population growth with economic development.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	2	1	1	1	-	-	2	1
CO2	1	1	1	-	1	-	-	1	1
CO3	2	-	1	-	1	-	-	1	-
C04	1	-	-	-	1	-	-	1	-

BCM-104

Corporate Accounting

L-T-P: 4-0-0

Course Outcomes:

CO1: Apply the provisions of Companies Act for issue of shares at Par, Premium and Discount, Forfeiture and Reissue of Shares.

CO2: Apply various methods of valuation of goodwill and

Shares CO3: Construct Consolidated balance sheet after

Amalgamation

CO4: Make use of relevant schedules (New Format) of Banking company accounts to prepare the Profit and Loss Account and Balance Sheet.

CO5: Make use of relevant schedules (New Format) to prepare final statement of accounts of Insurance company.

Unit Wise Syllabus

Pos Cos	PO1	PO2	PO3	PO4	PO5	P O 6	PO 7	PO8	PO9
CO1	2	1	-	-	-	-	1	-	1
CO2	3	1	-	-	-	-	-	-	1
CO3	3	2	-	-	1	-	1	-	1
CO4	3	2	-	-	-	-	1	-	2
CO5	2	1	-	-	1	-	3	-	1

MG-106

E-Commerce

L-T-P: 4-0-0

Note: Latest edition of the books should be used

Course Outcomes:

CO1: Understand concept and types of e-commerce.

CO2: Discuss the network infrastructure for e-commerce.

CO3: Describe the security and legal aspects of e-commerce

CO4: Explain Website Designing and publishing

CO5: Describe different types of e-payment systems and methods

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	1	-	-	-	-	-	-	-	1
CO2	1	-	-	1	2	-	-	-	1
CO3	2	-	1	1	1	-	-	-	1
CO4	1	1	-	1	-	-	-	-	1
CO5	1	1	-	1	-	-	-	-	1

MG-108

Principles of Management

L-T-P: 4-0-0

CO1: Summarize the nature, process and importance of business management. Compare and contrast the contributions of Indian and International Management Thinkers.

CO2: Discuss the process and types of planning and decision making.

CO3: Distinguish the concepts of authority, responsibility and accountability, centralization and decentralization; and Organization structure. Explain the process of staffing.

CO4: Defend the significance of motivation citing the theories of Maslow, Herzberg, McGregor, Ouchi and David McClelland

CO5: Display different leadership style appropriate to the situation and communicate effectively.

CO6: Explain the strategies of effective managerial control system. Propose a model to carry out the process of change management.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P O 9
CO1	2	2	-	-	-	1	-	2	1
CO2	2	2	1	-	-	-	2	1	-
CO3	3	2	-	-	1	1	1	1	1
CO4	2	2	-	-	1	1	1	1	1
CO5	3	2	-	-	1	1	2	1	1
CO6	3	2	1	-	1	1	1	1	1

MG-110

Business Organization & Management

L-T-P: 4-0-0

Course Outcomes:

CO1: Summarize the nature and forms of business organization and management.

CO2: Discuss the process and types of planning and decision making.

CO3: Distinguish the concepts of authority, responsibility and accountability, and Organization structure. Explain the process of staffing.

CO4: Explain the significance of motivation citing the theories of Maslow, Herzberg, McGregor, Display different leadership style

CO5: Explain the strategies of effective managerial control system. Propose a model to carry out the process of change management.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	2	-	-	-	-	-	2	1
CO2	2	1	1	-	-	-	2	1	-
CO3	1	1	-	-	1	-	1	1	1
CO4	2	1	-	-	1	1	1	1	1
CO5	1	2	-	-	1	1	2	1	1

MG-114

Project Management

L-T-P: 4-0-0

Course Outcome:

The basic objective of this course is to familiarize the students with the various aspects of Projects and key guidelines relevant to project planning, analysis, financing, selection, implementation and review.

CO1: Understand the basics about project management and its various types.

CO2: Enable them to develop project formulation and preparation of project report.

CO3: Equip the students for project appraisal and corrective measures.

CO4: Understand more about project finance and its sources.

CO5: Awareness about project evaluation methods.

Pos Cos	PO 1	PO 2	PO3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	2	2	-	-	1	-	-	3	1
CO 2	1	1	1	1	1	-	-	2	-
CO 3	1	1	1	-	1	-	-	2	-
C04	2	-	1	1	-	-	-	1	-
CO 5	1	-	-	1	1	-	-	2	-

Semester III

MG-201

Human Resource Management

L-T-P: 4-0-0

Course Outcomes

CO1: Explain the importance of human resources in an organization.

CO2: Outline the dimensions; job analysis and job description and procedure for recruitment and selection.

CO3: Describe identifying the training need, implementation, monitoring and assessment procedures of training.

CO4: Understanding the importance of Performance appraisal system.

CO5: State the significance of compensation for employee and grievance redressal

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	2	3	-	-	-	1	1	-	1
CO 2	3	2	-	-	-	1	-	-	1
CO 3	3	2	-	-	-	-	1	-	1
CO 4	2	3	-	-	-	-	-	-	1
CO 5	3	2	-	-	-	-	1	-	1

BCM-201

Management Accounting

L-T-P: 4-0-0

Course Outcomes:

CO1: Make use of ratio analysis and interpret it.

CO2: Construct cash flow statement as per AS 3

CO3: Utilize Marginal costing technique for decision making.

CO4: Construct cash budget.

CO5: Application of standard costing technique to analyze variance in Material, Labour , overhead and Sales cost.

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	2	2	2	2	2	-	1	-	1
CO 2	2	-	1	1	-	1	1	-	1
CO 3	2	1	2	-	1	1	1	-	1
CO 4	2	1	1	-	1	1	1	-	1
CO 5	2	1	1	-	-	-	1	-	1

BL-201

Corporate Law

L-T-P: 4-0-0

Course Outcomes:

CO1: Explain the nature of company and procedure for formation of Company as per Indian Companies Act (Amendment 2013).

CO2: Compare and contrast Memorandum of Association and Articles of Association.

CO3: Summarize the Rights and liabilities of company shareholders.

CO4: Describe powers and duties of company directors and procedure for convening statutory and other meetings.

CO5: Explain circumstances and the procedure for winding up of the company.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	1	1	-	-	1	1	1	-	1
CO2	2	-	-	-	-	1	1	-	2
CO3	2	-	-	-	1	1	-	-	1
CO4	2	1	-	-	-	2	1	-	1
CO5	2	1	-	-	1	2	-	-	2

HSS-201

ADVANCED BUSINESS COMMUNICATION

L-T-P: 3-0-0

Course Outcomes:

CO1: Discuss the objectives, process, functions and importance of business letters. Comply with the rules and write business letters.

CO2: Write letters of enquiry, replies, orders, cancellation, complaints, claim and adjustments. Conform the points to be considered while writing these letters.

CO3: Write circulars, sales and collection letters in the appropriate format. Display the techniques to use mail merge in sending circular letters.

CO4: Differentiate business correspondence with agencies, banks and insurance companies. Conform the points to be considered while writing these letters.

CO5: Formulate appealing curriculum vitae to apply for a job. Illustrate the techniques to send curriculum vitae through E-Mail.

CO6: Summarize the essentials of a good report and its types. Prepare a press report. Identify elements of Communication and develop holistic understanding of communication and its importance in the 21st century.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	2	-	-	-	1	2	1	1
CO2	2	2	1	-	-	1	2	1	1
CO3	2	2	1	2	-	1	2	1	1
CO4	3	2	-	-	-	1	2	1	1
CO5	2	2	-	2	-	1	2	-	1
CO6	3	2	1	-	-	1	2	1	1

BS-205

Quantitative Analysis

L-T-P: 4-0-0

Course Outcomes:

CO1: Understand the basic concept of Statistics.

CO2: Know how we test the hypothesis with different statistical tools.

CO3: Examine the index numbers

CO4: Develop hypothesis under various situations.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	1	-	-	-	-	-	-	-
CO2	1	-	1	2	-	-	-	-	-
CO3	1	-	-	2	-	-	-	-	-
CO4	1	-	2	2	1	-	-	-	-

SEMESTER-IV

MG-202

Entrepreneurship Development

L-T-P: 4-0-0

Course Outcomes:

CO1: Explain factors stimulating entrepreneurship and obstacles in entrepreneurial growth.

CO2: Explain contemporary role models in Indian business

CO3: Explain role of Public and Private system of stimulation.

CO4: Understand the significance of writing the business plan/project proposal.

CO5: Describe the possibilities of mobilizing resources for startup.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	-	2	1	1	-	-	1	-
CO2	-	-	-	-	1	-	1	1	1
CO3	1	-	1	-	-	-	1	1	1
CO4	1	-	1	1	1	1	1	1	1
CO5	1	-	1	-	1	-	-	1	1

BCM-204

Auditing

L-T-P: 4-0-0

Course Outcomes

CO1: Explain the types of audit and objectives of audit.

CO2: Summarize audit planning and conduct of audit.

CO3: Explain Vouching of Trading Transaction and Verification & Valuation of Assets & Liabilities

CO4: Explain the Qualification, Rights, Duties, and Liabilities. Professional Ethics of an auditor .

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P O 9
CO1	3	2	2	-	1	2	2	2	1
CO2	2	1	-	-	-	2	2	1	1
CO3	2	-	1	-	1	2	1	2	1
CO4	-	-	-	-	-	2	1	1	1

MG-204

Macroeconomics & its Applications

L-T-P: 4-0-0

Course Outcomes:

CO1: Explain concept of GDP, budget deficit and source of financing.

CO2: Identify the sources of economic growth in the long-run including government policies to raise living standards..

CO3: Discuss the basic concepts of consumption, saving, investment in a closed and open economy.

CO4: Examine the role of the financial market in the economy.

CO5: Assess the effects of policies and economic issues on the domestic and foreign economy to make decisions.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	2	1	-	1	-	-	1	1
CO2	2	1	_1	-	2	-	-	1	-
CO3	2	1	-	-	1	-	-	-	1
CO4	2	-	-	-	1	-	-	-	1
CO5	1	-	1	-	2	-	1	2	1

MG-208

Cost Accounting

L-T-P: 4-0-0

Course Outcomes:

CO1: Understanding various elements of cost and costing techniques of valuation of cost and Constructing a cost sheet and preparation of quotations for submission.

CO2: Outline the procedure for purchase of material, storing and issue of materials and valuation of materials.

CO3: Calculate earnings of Workers under different methods.

CO4: Choose basis for allocation and apportionment factory indirect costs and absorption of overheads. CO5: Application costing techniques for contract work.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	2	-	-	-	-	1	-	1
CO2	3	2	-	-	-	-	1	-	1
CO3	3	2	-	-	-	-	1	-	1
CO4	3	2	-	-	-	-	-	-	1
CO5	3	2	-	-	-	-	-	-	1

BS-202

Business Mathematics

L-T-P: 4-0-0

Course Outcomes:

CO1: Find inverse of a matrix through determinant method.

CO2. Apply the Rules of differentiation

CO3. Find Simple and compound interest. Rates of interest.

CO4. Find Central Tendency and Standard deviation

CO5: Find correlation and regression coefficients

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	1	1	2	-	-	-	-	-	-
CO2	1	1	2	-	-	-	-	-	-
CO3	-	-	-	-	1	-	1	-	1
CO4	1	1	1	-	1	-	1	1	1
CO5	1	1	1	-	1	-	1	1	1

CE-108

ENVIRONMENTAL SCIENCE & ECOLOGY

L-T-P: 3-0-0

Course Outcome

CO1: To study the nature of environmental studies

CO2: To understand the ecosystem.

CO3: To develop the knowledge about biodiversity

CO4: To analyze the global environment.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	-	-	-	-	-	-	-	1
CO2	-	2	-	-	1	-	1	2	2
CO3	2	-	1	-	-	-	1	1	1
C04	2	-	-	1	-	2	-	1	1

Semester V

MG-301

Banking and Insurance Law

L-T-P: 4-0-0

Course Outcomes:

CO1: Explain functions of banking and banker customer relationship.

CO2: Summarize the different sources and uses of funds in Banks.

CO3: Describe principles of operations in Indian Money Market.

CO4: Summarize the importance of internet banking.

CO5: Explain the types of risk and concept of insurance.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	1	-	-	-	-	-	1	1
CO2	2	1	-	1	-	-	-	1	-
CO3	2	1	-	-	1	-	-	1	1
CO4	1	1	-	1	1	-	-	1	-
CO5	2	1	-	-	1	-	-	1	-

MG-303

Corporate Governance

L-T-P: 4-0-0

Course Outcomes:

CO1: Discuss the concept and models of corporate governance. CO2: Discuss Corporate governance and the role of the Board. CO3: Explain the Audit Committees for corporate governance.

CO4: Summarize trends in e-governance and Corporate Governance rating. CO5: Correlate Business Ethics and CSR.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	1	2	-	1	2	-	-	-	1
CO2	1	1	-	1	1	-	1	-	1
CO3	1	-	-	-	-	-	2	1	1
CO4	-	1	-	-	-	1	1	1	1
CO5	1	1	-	-	1	2	-	1	1

BCM-303A

Business Data Analytics

L-T-P: 4-0-0

Course Outcomes:

CO1: To understand data driven organisation.

CO2: To understand the prerequisites of analytical tools.

CO3: To understand the linear regression model and multi- collinearity

CO4: To understand R and R studio

CO5: Help the students in understanding textual data analysis.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	1	2	2	1	-	-	-	-	1
CO2	2	1	1	2	-	-	1	-	-
CO3	2	2	-	2	-	-	1	-	1
CO4	1	1	-	1	-	-	-	-	-
CO5	2	1	-	2	-	-	-	-	-

BCM-303B

Goods & Services Tax

L-T-P: 4-0-0

Course Outcome

CO1: Enable the student to learn the concepts of indirect tax and GST.

CO2: Understand the importance of GST and its contribution in the economy.

CO3: Understand the practical implication of GST.

CO4: Implement tax planning, tax management and payment of tax and its filling process.

CO5: Understand the custom law.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	1	-	-	3	-	-	-	1
CO2	3	2	-	-	-	-	1	-	-
CO3	-	1	-		1	-	-	-	-
CO4	3	1	-	-	-	-	-	-	1
CO5	2	1	-	-	-	-	-	-	-

BCM-303C

Banking & Financial Institutions

L-T-P: 4-0-0

Course Outcomes:

CO1: Understand the overall Banking and Indian financial system- financial markets, financial instruments and financial services.

CO2: Understand the functions and objectives of merchant banking.

CO3: Classify the various types of Mutual Funds..

CO4: Identify the role that venture capitalists play in the modern day business environment.

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	2	1	-	1	2	1	1	2	1
CO 2	2	-	-	-	1	-	-	-	-
CO 3	2	-	-	1	1	-	-	-	-
CO 4	2	-	-	-	1	-	1	-	-

BCM-305A

Financial Technology & Analytics

L-T-P: 4-0-

0

Course Outcome:

CO1: Conceptualise the evolution of technology in financial markets. CO2: Understanding the application of lending and personal finance. CO3: Concept and implications of digital payments.

CO4: Understanding the fintech in India.

CO5: Analytics of Artificial Intelligence and data security.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	1	1	-	-	-	-	1	-	1
CO2	2	1	-	-	-	-	1	-	-
CO3	1	1	-	-	1	-	2	-	-
CO4	-	2	-	-	-	-	-	-	1
CO5	-	1	-	-	-	-	1	-	1

BCM-305B

Mergers & Acquisitions Management

L-T-P: 4-0-0

Course Outcomes:

CO1: Understand M&A with its different classifications, strategies, theories, synergy etc.

CO2. Conduct financial evaluation of M&A and analyze the results

CO3: Evaluate different types of M&A, takeover and anti takeover strategies.

CO4: Familiarize with accounting of Amalgamation.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	1	-	-	-	-	1	-	1
CO2	2	1	-	1	1	-	-	1	-
CO3	2	1	-	-	-	-	1	-	1
CO4	2	-	-	1	-	-	-	-	1

BCM-305C

Stock Market Operations

L-T-P: 4-0-0

Course Outcome:-

CO1: Have a broad understanding about Indian Securities Markets

CO2: Operations of Indian Stock Market, New Issue Market; Listing of Securities, Cost of investing in securities.

CO3: Compare the Different Types of Financial Securities.

CO4: Understand the regulatory framework of SEBI and regulation 2015.

CO5: Conceptualise the concept and significance of demat trading and SEBI guidelines.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	1	1	-	-	-	-	1	-	1
CO2	2	-	-	-	-	1	2	-	1
CO3	2	-	-	-	-	-	1	-	1
CO4	2	-	-	-	-	1	1	-	-
CO5	1	-	-	-	-	-	2	-	1

SEMESTER VI

MG-302

Financial Reporting & Analysis

L-T-P: 4-0-0

Course Outcome:

CO1: Apply the knowledge of accounting principles, concepts and conventions, Accounting Standards in preparation of financial statements and it's reporting

CO2: To examine financial statements and facilitate decision making.

CO3: Critically analyze financial ratios.

CO4: Apply the concept of working capital and preparation of statements.

CO5: Evaluate the dynamic of cash flow analysis.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	2	1	1	-	-	-	1	1
CO2	1	1	1	-	-	-	-	-	1
CO3	-	-	1	-	-	-	1	1	1
CO4	1	-	2	-	-	-	1	-	-
CO5	1	-	1	-	1	-	1	-	-

MG-304

Industrial Relations & Labour Laws

L-T-P: 4-0-0

Course Outcomes:

CO1: Describe and understand the knowledge of the field of industrial relations.

CO2: Understand and critically analyze the role of trade unions and the main state specialized agencies in India.

CO3: Apply the essential concepts of industrial relations and their interrelationship at the personal, organizational and national levels.

CO4: Apply and analyze the legal provisions for human resources in an Industry.

CO5: Identify and evaluate the importance of voluntarism as a dispute resolution mechanism of longstanding importance and effectiveness in the workplace.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	2	1	-	-	-	1	1	2
CO2	2	-	1	1	-	-	1	2	1
CO3	1	-	-	-	1	-	1	1	1
CO4	-	-	2	1	1	-	-	1	-
CO5	-	-	3	-	1	-	-	2	1

MG-304A

Artificial Intelligence for business

L-T-P: 4-0-0

Course Outcome:

CO1: Demonstrate fundamental understanding of artificial intelligence (AI) and expert systems.

CO2: Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.

CO3: Demonstrate proficiency in applying AI in Banking & Insurance Redefined banking industry along with methods to models.

CO4: Understand the AI in Retail AI interventions in Retail Outlets.

CO5: Analyse the AI portfolio management, Chatbots and crypto-currency.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	1	1	-	-	-	1	1	2
CO2	2	-	1	1	-	-	1	2	1
CO3	1	-	-	-	1	-	1	1	1
CO4	-	-	2	1	1	-	-	1	-
CO5	-	-	3	-	1	-	-	2	1

MG-304B

Investment Management

L-T-P: 4-0-0

Course Outcome

CO1 - To develop a thorough understanding of the process of investments and financial markets (stock markets in India).

CO2 - To provide conceptual insights into the valuation of equity.

CO3 - To provide the insight about the bond terminology, bond risk management and valuation of bonds.

CO4 - To familiarize the students understand the concept of fundamental and technical analysis.

CO5 - To familiarize with conceptual insight of Efficient Market Hypothesis

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	1	-	1	-	1	-	-	-	1
CO2	1	-	-	-	1	-	-	-	-
CO3	-	1	-	-	-	-	-	-	1
CO4	2	1	1	1	-	-	-	-	-
CO5	1	1	1	1	-	-	1	2	1

MG-304C

Income Tax Practices

L-T-P: 4-0-

0

Course Outcomes:

CO1: Define the important definitions under Section 2, 2 (7), 2(9), 2 (14), 2(24), 2(31), 3 of Income Tax Act.

CO2: Make use of Sec 15, 16 and 17 of Income Tax Act provisions relating to computation of salary income of an individual.

CO3: Make use of Income tax Act to compute taxable income from house property under Sec 23 to 27 of Income Tax Act.

CO4: Make use of Income Tax Act to assess taxable income from capital gain.

CO5: Explain tax planning related to salaries and property income.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	1	-	-	-	2	-	-	-
CO2	3	2	-	-	2	1	-	-	-
CO3	2	2	-	-	2	-	1	-	-
CO4	3	2	-	-	2	-	2	-	-
CO5	2	2	-	-	-	-	1	-	-

MG-308A

Financial Reporting & Analysis

L-T-P: 4-0-0

Course Outcome:

CO1 - Analyze the financial statements.

CO2- Prepare financial statement comprises trial balance, profit and loss account and balance sheet

CO3 - Computation and application of accounting ratios for evaluation of performance

CO4 - Reconcile Fund Flow and Working Capital Analysis

CO5 - Calculate Cash Flows as per AS 3 and Ind AS 7.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	1	1	-	-	-	-	1	1	1
CO2	1	1	-	-	1	-	1	1	1
CO3	1	2	-	-	-	-	-	1	1
C04	-	-	-	-	1	-	-	-	-
C05	1	-	-	-	1	-	-	1	1

MG-306B

Business Tax Procedures & Management

L-T-P: 4-0-0

Learners are advised to use web sources too

Course Outcome:

CO1- To understand the Basic Aspects of Tax Planning and Tax Management

CO2- To familiar with the computation of income Firms Including LLP and Association of

Persons CO3- To know about the aggregation of income and provision of section 11

CO4- To know about Tax deductions

CO5- To be aware about the income tax technology (TAN, TIN)

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO 1	1	-	-	-	-	-	1	1	1
CO 2	1	1	-	-	-	-	1	1	1
CO 3	1	-	-	-	1	-	-	1	-
CO 4	-	-	-	-	1	-	-	-	-
CO 5	2	-	-	-	1	-	-	1	1

MG-308C

Corporate Tax Planning

L-T-P: 4-0-0

Course Outcome:

CO1- Justification of corporate tax planning

CO2- To collect the basic concepts and definitions of Income Tax Act 1961

CO3 - Implications of Tax concessions and incentives

CO4 - To familiarize Tax planning with reference to financial management decisions

CO5 - To understand Foreign collaborations and incidence of taxation on domestic companies

Pos Cos	PO 1	PO 2	PO3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
CO1	1	-	-	-	-	-	1	1	1
CO2	1	1	-	-	-	-	1	1	1
CO3	1	-	-	-	1	-	-	1	-
CO4	-	-	-	-	1	-	-	-	-
CO5	2	-	-	-	1	-	-	1	1

Outcomes-based Curriculum Framework

For

Commerce

B.B.A 2021-2024

Programme Educational Objectives (PEO)

PEO1: Develop into socially responsible and value driven people who are committed to long term development.

PEO2: To make managerial decisions, develop a creative, imaginative and entrepreneur mentality.

PEO3: Ability to adapt to a rapidly evolving, dynamic market climate and a desire to learn new skills.

PEO4: Provide advanced management skills for work and lifelong learning.

Mapping of PEOs with Mission Statements

PEO Statements	School Mission 1	School Mission 2	School Mission 3	School Mission 4
PEO1:	2	2	1	2
PEO2:	3	2	-	1
PEO3:	1	2	2	-
PEO4:	2	3	2	1

Program Outcomes (PO's)

PO1- Business environment and domain knowledge: Accounting, Finance, Corporate Laws, Auditing and Taxation are all areas in which students should be well-versed.

PO2- Critical thinking, business analysis, Problem Solving and Innovative Solutions: Identify, formulate, and analyze business issues in order to draw long-term conclusions based on results.

PO3- Global Exposure and Cross-Cultural Understanding: Refresh students' awareness on how to adopt global business practices.

PO4 – Social Responsiveness and Ethics: Incorporate social responsiveness and professional ethics into business management strategies and adhere to them.

PO5- Effective Communication: Communicate with all stakeholders effectively. Graduates should be able to communicate effectively both orally and in writing.

PO6- Life Long Learning: Prepare for post-graduate and higher education, as well as professional success.

PSO's:-

PSO1 – Achieve a solid foundation in the field of finance and accounting.

PSO 2 - possess adequate knowledge skills and experimental learning in area of commerce education

Mapping of Program Outcome with Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4
PO1	1	3	2	3
PO2	1	3	2	2
PO3	1	2	3	2
PO4	3	1	2	1
PO5	1	1	2	2
PO6	1	2	3	2
PSO 1	1	3	2	2
PSO 2	1	2	1	2

1. Slight (Low)

2. Moderate (Medium)

3.

Substantial

(High)

SEMESTER I

BACHELOR OF BUSINESS ADMINISTRATION

MG-101: BUSINESS STATISTICS

Course Outcome

CO1: Familiarizes the concept of statistics

CO2: Provide practical exposure on calculation of measures of average

CO3: Introduce the students about the concept of Research sample.

CO4: Provide the glimpse of business trends and projections

Unit Wise Syllabus

Pos Cos	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	PS O 1	PS O 2
C O1	3	-	-	-	-	1	-	2
C O2	-	2	2	-	-	-	-	2
C O3	1	-	-	-	-	-	-	1
C0 4	-	2	-	2	-	2	-	2

BACHELOR OF BUSINESS

ADMINISTRATION MG-103: FINANCIAL

MANAGEMENT

Course Outcome

CO1: Familiarize the concept of accounting and its system.

CO2: Understand the journal entries of a business.

CO3: Examine the financial statements of organizations.

CO4: Solve accounting problems.

Unit Wise Syllabus

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	3	-	-	-	-	-	3	-
CO2	3	-	1	-	-	-	3	-
CO3	3	-	-	-	-	-	3	-
CO4	3	-	2	-	-	-	3	-

**BACHELOR OF BUSINESS
ADMINISTRATION
MG-105: BUSINESS ECONOMICS**

Course Outcome

CO1: Understand the basic elements of managerial economics aspects, nature and decision-making

CO2: Understand the law of demand, supply forecasting, consumer durable

CO3: Understand theories of profit, profit maximization and analysis of Break Even Point

CO4: Develop cost functions from production functions.

CO5: Develop and evaluate the impact of government regulations.

Unit Wise Syllabus

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	-	2	-	-	-	-	3	-
CO2	3	-	-	-	-	-	2	-
CO3	2	-	1	-	-	-	2	-
CO4	2	1	-	1	-	2	1	-

**BACHELOR OF BUSINESS
ADMINISTRATION
CS-107: COMPUTER APPLICATIONS FOR BUSINESS**

Course Outcome

CO1: Gain knowledge of software.

CO2: Understand the web technology.

CO3: Get knowledge about communication media.

CO4: Explain electronic payment system.

Unit Wise Syllabus

Pos Cos	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P S O 1	P S O 2
C O 1	2	-	1	-	-	-	1	-
C O 2	3	-	-	-	-	-	-	2
C O 3	1	-	3	-	-	-	1	-
C O 4	1	-	-	1	-	2	-	2

**BACHELOR OF BUSINESS
ADMINISTRATION
BL-111: BUSINESS LAW**

Course Outcome

CO1: To know the development and the judicial setup of Labour

Laws CO2: Discuss law of contract principles

CO3: Enumerate contracts of indemnity and guarantee

CO4: Examine contracts of bailment and pledge

Unit Wise Syllabus

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	3	-	-	-	-	-	-	1
CO2	-	2	-	-	-	-	-	1
CO3	2	1	-	-	2	-	-	2
CO4	2	-	1	-	-	2	-	2

BACHELOR OF BUSINESS ADMINISTRATION
BBA-101: BUSINESS ORGANIZATION & ENVIRONMENT

Course Outcome

CO1: Familiarize with global business environment.

CO2: Make them understand about different financial institutions.

CO3: Develop the knowledge about international business.

CO4: Know about international market.

Unit Wise Syllabus

Pos Cos	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P S O 1	P S O 2
C O 1	3	-	-	-	-	1	-	2
C O 2	-	-	2	-	-	-	-	2
C O 3	2	1	-	-	-	-	-	3
C O 4	2	1	-	-	-	2	-	3

SEMESTER - II

**BACHELOR OF BUSINESS ADMINISTRATION
MG-102: Indian Economy**

Course Outcomes:

CO1: Explore national income and capital formation.

CO2: Rate economic growth and development.

CO3: Inspect the new economic reforms

CO4: Translate and relate population growth with economic development.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	1	1	1	-
CO2	1	1	1	-	1	-
CO3	2	-	1	-	1	-
CO4	1	-	-	-	1	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-102: Brand Management

L-4, T/P-0

Credits: 04

Course Outcome:

To successfully establish and sustain brands and lead to extensions

CO's:

CO1: Demonstrate knowledge of the nature & process of Brand management.

CO2: Examine the scope of brand management activity across the overall organizational context.

CO3: Evaluate the key issues in managing a brand portfolio.

CO4: Formulate brand management decisions.

Pos Cos	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6
C O1	1	-	-	-	-	-
C O2	1	-	-	1	2	-
C O3	2	-	1	1	1	-
C0 4	1	1	-	1	-	-

**BACHELOR OF BUSINESS
ADMINISTRATION
MG-106: E-Commerce**

L-4, T-0

Credits –4

Course Outcomes:

CO1: Understand concept and types of e-commerce.

CO2: Discuss the network infrastructure for e-commerce.

CO3: Describe the security and legal aspects of e-commerce

CO4: Explain Website Designing and publishing

CO5: Describe different types of e-payment systems and methods

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO1	1	-	-	-	-	-
CO2	1	-	-	1	2	-
CO3	2	-	1	1	1	-
C04	1	1	-	1	-	-
CO5	1	1	-	1	-	-

BACHELOR OF BUSINESS ADMINISTRATION
MG-108: Principles of Management

L-4, T-0

Credits –4

CO1: Summarize the nature, process and importance of business management. Compare and contrast the contributions of Indian and International Management Thinkers.

CO2: Discuss the process and types of planning and decision making.

CO3: Distinguish the concepts of authority, responsibility and accountability, centralization and decentralization; and Organization structure. Explain the process of staffing.

CO4: Defend the significance of motivation citing the theories of Maslow, Herzberg, McGregor, Ouchi and David McClelland

CO5: Display different leadership style appropriate to the situation and communicate effectively.

CO6: Explain the strategies of effective managerial control system. Propose a model to carry out the process of change management.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	-	-	-	1
CO2	2	2	1	-	-	-
CO3	3	2	-	-	1	1
CO4	2	2	-	-	1	1

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-104: Business Ethics and Corporate Social Responsibility

L-4, T/P-0,

Credits: 04

CO1 To recollect concepts on ethical management practices in the business and appreciate the value system of ancient times and its applicability to modern business situations

CO2 To bring up value system in an organization based on ethics and provide knowledge about ethical decision making

CO3 To know the role of ethics in corporate governance.

CO4 To create knowledge about ethics and its application in functional areas of business

CO5 To create knowledge about ethics and corporate social responsibility

Pos Cos	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6
C O 1	2	2	-	-	1	-
C O 2	1	1	1	1	1	-
C O 3	1	1	1	-	1	-
C O 4	2	-	1	1	-	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
MG-114: Project Management

L-4, T/P-0,

Credits: 04

Course Outcome:

The basic objective of this course is to familiarize the students with the various aspects of Projects and key guidelines relevant to project planning, analysis, financing, selection, implementation and review.

Course Outcomes:

CO1: Understand the basics about project management and its various types.

CO2: Enable them to develop project formulation and preparation of project report.

CO3: Equip the students for project appraisal and corrective measures..

CO4: Understand more about project finance and its sources.

CO5: Awareness about project evaluation methods.

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	-	-	1	-
CO 2	1	1	1	1	1	-
CO 3	1	1	1	-	1	-
CO 4	2	-	1	1	-	-

**BACHELOR OF BUSINESS ADMINISTRATION (BBA)
MG-104: Business Taxation**

L-4, T/P-0,

Credits: 04

CO1- To provide knowledge about goods service tax

CO2- To create employability to the students in the commercial tax

practices CO3- To understand the procedure for registration tax

CO4- To know tax related with movement of goods

CO5- To understand the appeals, offences and penalties with respect to taxation

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	-	-	1	-
CO 2	1	1	1	1	1	-
CO 3	1	1	1	-	1	-
CO 4	2	-	1	1	-	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
MG-114: Project Management

L-4, T/P-0,

Credits: 04

Course Outcome:

The basic objective of this course is to familiarize the students with the various aspects of Projects and key guidelines relevant to project planning, analysis, financing, selection, implementation and review.

Course Outcomes:

CO1: Understand the basics about project management and its various types.

CO2: Enable them to develop project formulation and preparation of project report.

CO3: Equip the students for project appraisal and corrective measures..

CO4: Understand more about project finance and its sources.

CO5: Awareness about project evaluation methods.

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	-	-	1	-
CO 2	1	1	1	1	1	-
CO 3	1	1	1	-	1	-
CO 4	2	-	1	1	-	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
MG-104: Business Taxation

L-4, T/P-0,

Credits: 04

Objectives: To equip students with the application of principles and provisions of Income Tax.

CO1- To provide knowledge about goods service tax

CO2- To create employability to the students in the commercial tax

practices CO3- To understand the procedure for registration tax

CO4- To know tax related with movement of goods

CO5- To understand the appeals, offences and penalties with respect to taxation

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	-	-	1	-
CO 2	1	1	1	1	1	-
CO 3	1	1	1	-	1	-
CO 4	2	-	1	1	-	-

**BACHELOR OF BUSINESS ADMINISTRATION (BBA)
MG166: Social Service**

SEMESTER - III

**LINGAYA'S VIDYAPEETH
NACHUALI, JASANA ROAD, FARIDABAD
BACHELOR OF BUSINESS ADMINISTRATION
BL-201: Corporate Law**

Course Outcomes:

CO1: Explain the nature of company and procedure for formation of Company as per Indian Companies Act (Amendment 2013).

CO2: Compare and contrast Memorandum of Association and Articles of Association.

CO3: Summarize the Rights and liabilities of company shareholders.

CO4: Describe powers and duties of company directors and procedure for convening statutory and other meetings.

CO5: Explain circumstances and the procedure for winding up of the company.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	1	-	-	1	1
CO2	2	-	-	-	-	1
CO3	2	-	-	-	1	1
CO4	2	1	-	-	-	2

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-201: Production & Operations Management

CO 1	To discuss the production and operation functions
CO 2	To apply the concept of materials flow, replenishment with reference to operations
CO 3	To evaluate capacity planning, inventory management and supply chain management in decision making.
CO 4	To investigate the contemporary issues related to production and operation management in order to meet uncertainty.

Pos Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	-	-	1	-
CO 2	1	1	1	1	1	-
CO 3	1	1	1	-	1	-
CO 4	2	-	1	1	-	-

BACHELOR OF BUSINESS ADMINISTRATION
MG-201: Human Resource Management

Objective: To acquaint the learners with the techniques and principles to manage human resources of an organization.

Course Outcomes

CO1: Explain the importance of human resources in an organization.

CO2: Outline the dimensions; job analysis and job description and procedure for recruitment and selection. CO3: Describe identifying the training need, implementation, monitoring and assessment procedures of training.

CO4: Understanding the importance of Performance appraisal system.

CO5: State the significance of compensation for employee and grievance redressal.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	-	-	-	1
CO2	3	2	-	-	-	1
CO3	3	2	-	-	-	-
CO4	2	3	-	-	-	-

**BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-203: Marketing Management**

CO 1	Discuss the significance of concepts & theories of marketing.
CO 2	Analyse the data for making marketing decisions from MIS
CO 3	Demonstrate analytical skills in identification and resolution of problem pertaining to marketing management through marketing mix strategies
CO 4	Evaluate the recent trends in the contemporary marketing environment

CO-PO & CO-PSO Mapping

Mapping	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	3	1	1	2	1	1	2	3	2
CO 2	2	3	1	2	1	2	1	3	1
CO 3	2	3	1	2	1	1	3	3	1
CO 4	2	2	2	3	1	3	2	3	1

SEMESTER - IV

**BACHELOR OF BUSINESS ADMINISTRATION
BBA-202: Entrepreneurship Development**

Course Outcomes:

CO1: Explain factors stimulating entrepreneurship and obstacles in entrepreneurial growth.

CO2: Explain contemporary role models in Indian business

CO3: Explain role of Public and Private system of stimulation.

CO4: Understand the significance of writing the business plan/project proposal.

CO5: Describe the possibilities of mobilizing resources for startup.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	-	2	1	1	-
CO2	-	-	-	-	1	-
CO3	1	-	1	-	-	-
CO4	1	-	1	1	1	1

BACHELOR OF BUSINESS ADMINISTRATION

MG-204: Macroeconomics & its Applications

Course Outcomes:

CO1: Explain concept of GDP, budget deficit and source of financing.

CO2: Identify the sources of economic growth in the long-run including government policies to raise living standards..

CO3: Discuss the basic concepts of consumption, saving, investment in a closed and open economy.

CO4: Examine the role of the financial market in the economy.

CO5: Assess the effects of policies and economic issues on the domestic and foreign economy to make decisions.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	1	-	1	-
CO2	2	1	_1	-	2	-
CO3	2	1	-	-	1	-
C04	2	-	-	-	1	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
MG-206: Research Methodology

CO's:

CO1: Discuss the significance and process of research.

CO2: Gather the required data using appropriate sampling and scaling techniques.

CO3: Analyze and interpret data collected for the problem.

CO4: Use advanced data analysis tools and techniques.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	2	-	1	2	-
CO2	1	1	-	1	1	-
CO3	1	-	-	-	-	-
CO4	-	1	-	-	-	1

BACHELOR OF BUSINESS ADMINISTRATION (BBA)

BBA 206: Digital Marketing

CO's:

CO1: Demonstrate knowledge of the nature & process of DIGITAL MARKETING.

CO2: Examine the scope of DIGITAL MARKETING activity across the overall organizational context.

CO3: Evaluate the key issues in managing a digitally.

CO4: Formulate decisions in digital era

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	-	2	1	1	-
CO2	-	-	-	-	1	-
CO3	1	-	1	-	-	-
CO4	1	-	1	1	1	1

BACHELOR OF BUSINESS ADMINISTRATION
CS-216: Management Information System

Course Outcomes:

CO1: Understand Information systems with its recent developments.

CO2: Know about the role of MIS in consumers.

CO3: Analyze the relationships between information systems and organizations.

CO4: Explain relationships between concepts of information systems.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	1	1	1	1	-
CO2	2	-	1	-	1	-
CO3	1	-	1	-	1	-
CO4	1	-	1	-	-	-

SEMESTER – V

**BACHELOR OF BUSINESS ADMINISTRATION
(BBA)**

MG-301: Banking and Insurance Law

Course Outcomes:

CO1: Explain functions of banking and banker customer relationship.

CO2: Summarize the different sources and uses of funds in Banks.

CO3: Describe principles of operations in Indian Money Market.

CO4: Summarize the importance of internet banking.

CO5: Explain the types of risk and concept of insurance.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	-	-	-	-
CO2	2	1	-	1	-	-
CO3	2	1	-	-	1	-
CO4	1	1	-	1	1	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-305A: Personal Financial Planning

CO's:

CO1: To understand the basics of finance and assess the cash flows.

CO2: To learn the process of budgeting

CO3: Analyses the investment strategies

CO4: Evaluate the tools for calculation of finances.

P o C o s	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P S O 1	P S O 2
CO1	2	1	1	2	-	1	-	-
CO2	-	1	-	-	1	1	-	2
CO3	2	1	-	2	2	1	1	1
CO4	-	3	3	1	2	-	-	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-305B: Retail Marketing

L-4, T/P-0,

Credits: 04

Objective:

The objective of the course is to enhance the students with the skills required to be directly employed as a sales or marketing executive manager or to start a retail business of their own.

CO1: Understand the basics of retail marketing

CO2: Learn the strategy of retail marketing

CO3: To analyses the promotional techniques.

CO4: Evaluate the various layout and design of marketing.

P o s C o s	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P S O 1	P S O 2
CO 1	3	1	1	2	-	1	1	1
CO 2	2	1	3	3	1	2	2	3
C O3	2	1	-	2	2	1	2	1
C O4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-305C: Performance Management

CO's:

CO1: Understand the fundamentals of performance management.

CO2: Develop an understanding of why and how the performance of employees to be evaluated and rewarded

CO3: learn various methods and tools used for managing employee's performance.

CO4: to identify performance gaps and to develop tools to bridge the gaps.

POs C os	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2
CO 1	3	1	1	2	-	1	1	1
CO 2	2	1	3	3	1	2	2	3
CO 3	2	1	-	2	2	1	2	1
CO 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-305D: International Business Operations

CO's:

CO1: Understand the concept of international business.

CO2: Learn about the global trading environment & FDI

CO3: Analyses of international financial environment

CO4: Evaluate the functioning international economic institutions

P o s C o s	PO 1	P O2	PO 3	P O4	PO 5	PO 6	P SO 1	P SO 2
C O 1	-	1	1	2	-	1	1	1
C O 2	2	1	2	-	1	2	-	2
C O 3	2	1	-	-	1	-	2	-
C O 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION
BBA-305E: Mergers & Acquisitions

Course Outcomes:

CO1: Understand M&A with its different classifications, strategies, theories, synergy etc.

CO2. Conduct financial evaluation of M&A and analyze the results

CO3: Evaluate different types of M&A, takeover and anti takeover strategies.

CO4: Familiarize with accounting of Amalgamation.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	-	-	-	-
CO2	2	1	-	1	1	-
CO3	2	1	-	-	-	-
C04	2	-	-	1	-	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-307A: Public Relations and Corporate Image

CO's:

CO1: Understand the Growth and development of PR with special reference to India

CO2: Learn about the various P.R. Tools

CO3: Helpful in Corporate Reputation in Global Society

CO4: To know the Corporate Engagement in the Digital Era.

P o s s i b l e C o u n t	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P S O	
							1	2
C O 1	-	1	1	2	-	1	1	1
C O 2	2	1	2	-	1	2	-	2
C O 3	2	1	-	-	1	-	2	-
C O 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION

(BBA)

BBA-307B: Advertising and Sales Promotion

CO1 Studying the characteristics, types & impact of non products ADs.

CO2 Learning the types of media, advantages & disadvantages of ads medias.

CO3 Analysing media selection, planning & factors influencing media planning.

CO4 Understanding the techniques of sales promotion and know about the online sales promotions to create awareness among the students regarding the sale.

Pos Courses	PO 1	PO 2	PO 3	PO4	PO 5	PO6	PS O 1	PS O 2
CO 1	-	1	1	2	-	1	1	1
CO 2	2	1	2	-	1	2	-	2
CO 3	2	1	-	-	1	-	2	-
CO 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-307C: Analytical Decision Making

CO1 Studying the Decision making theory.

CO2 Learning the types of sampling & how to frame the hypothesis..

CO3 Helpful in analysing the time series

CO4 Understanding the techniques of analytical decision making

P o s t s	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P S O 1	P S O 2
C O 1	-	1	1	2	-	1	1	1
C O 2	2	1	2	-	1	2	-	2
C O 3	2	1	-	-	1	-	2	-
C O 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)

BBA-307D: Financial Markets

1. CO's:

CO1: Enable the students with Financial Markets and its various segments.

CO2: To give the students and understanding of the operations and developments in financial markets in India. CO3: To acquaint them to gain an insight into the functioning and role of financial institutions in the Indian Economy.

CO4: To understand financial institutions.

P o s C o s	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P S O 1	P S O 2
CO 1	-	1	1	2	-	1	1	1
C O2	2	1	2	-	1	2	-	2
CO 3	2	1	-	-	1	-	2	-
C O4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-307E: Supply and Chain Logistics

CO's:

CO-I To analyze production management and types of Production System; plant location; factors affecting locations and plant layouts

CO-II To understand Importance & Procedure of Production Planning, Routing scheduling, factors affecting scheduling, Dispatch & Follow up

CO- III To acquire knowledge on Quality Control and supply chain management (SCM) operation CO-IV To understand Logistics Management and its concepts

Pos Cos	PO 1	PO 2	PO 3	PO4	PO 5	PO6	PS O 1	PS O 2
CO 1	-	1	1	2	-	1	1	1
CO 2	2	1	2	-	1	2	-	2
CO 3	2	1	-	-	1	-	2	-
CO 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
MG-307E: Business Finance

CO's:

CO1: Understand the concept of finance.

CO2: Learn about the various financial tools

CO3: Helpful in making investment decisions.

CO4: Evaluate the financial projects efficiently

POs COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2
CO1	-	1	1	2	-	1	1	1
CO2	2	1	2	-	1	2	-	2
CO3	2	1	-	-	1	-	2	-
CO4	-	3	3	1	2	-	3	-

SEMESTER – VI

BACHELOR OF BUSINESS ADMINISTRATION
(BBA)

MG-302: Business Policy and Strategic Management

Course Outcomes

- I. To provide an introduction on Business system and its function
- II. To understand the concepts of social audit, business policy and capitalist economy
- III. To enable them to familiarize with corporate strategy
- IV. To provide an idea about man power planning, product policies, market policies and capital procurement.

Pos C os	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P SO 1	P SO 2
C O1	-	1	1	2	-	1	1	1
C O 2	2	1	2	-	1	2	-	2
C O 3	2	1	-	-	1	-	2	-
C O 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-304A: Introduction to Derivatives

CO's:

CO1: To know about stock exchange market

CO2: To understand the working structure of SEBI

CO3: To evaluate the recent Developments in derivatives market

CO4: To understand the mechanism & Settlement procedure of financial markets.

Pos Cos	PO 1	PO 2	PO 3	PO4	PO 5	PO6	PS O 1	PS O 2
CO 1	-	1	1	2	-	1	1	1
CO 2	2	1	2	-	1	2	-	2
CO 3	2	1	-	-	1	-	2	-
CO 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-304B: Services Marketing

- CO1: To understand consumer behaviour, customer perception and customer expectation of services.
 CO2. To provide the insight of understanding customer expectation through knowing service operations.
 CO3. To understand the marketing strategies of service mix in various service industries.
 CO4. Understanding of managing supply and demand in services industry

Pos Courses	PO 1	PO 2	PO 3	PO4	PO 5	PO6	PS O 1	PS O 2
CO 1	-	1	1	2	-	1	1	1
CO 2	2	1	2	-	1	2	-	2
CO 3	2	1	-	-	1	-	2	-
CO 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-304C: Strategic HRM

CO1: Investment Perspective of Human Resource Management

CO2: Helpful in analysing the environment, Organizational

CO3: Design and Resign of Work Systems

CO4: To know about the recruitment process

Pos Courses	PO 1	PO 2	PO 3	PO4	PO 5	PO6	PS O 1	PS O 2
CO 1	-	1	1	2	-	1	1	1
CO 2	2	1	2	-	1	2	-	2
CO 3	2	1	-	-	1	-	2	-
CO 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
MG-304D: WTO and International Trade Policy

CO1: To know about the international business environment

CO2: Helpful in analysing the WTO

CO3: To know about the importance of Theories of Trade and Foreign Exchange

CO4: To know about the international marketing

P o s C o s	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P S O 1	P S O 2
C O 1	-	1	1	2	-	1	1	1
C O 2	2	1	2	-	1	2	-	2
C O 3	2	1	-	-	1	-	2	-
C O 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
MG-304E: Event Management

CO1: To know about the Basics of Event Management

CO2: Helpful in analysing the Basics of marketing

CO3: To know about the importance of Consumer Behavior

CO4: To develop the Conversational English and PPT skills among students

Pos Courses	PO 1	PO 2	PO 3	PO4	PO 5	PO6	PS O 1	PS O 2
CO 1	-	1	1	2	-	1	1	1
CO 2	2	1	2	-	1	2	-	2
CO 3	2	1	-	-	1	-	2	-
CO 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION
BBA-306A: Financial Reporting & Analysis

CO's:

CO1: Knowledge of financial analysis and control tools

CO2: To Make appropriate application and uses of financial analysis and control

CO3: To know the role of companies Act.

CO4: Become familiar in analyzing the financial reports.

Pos Coss	PO 1	PO 2	PO 3	PO4	PO 5	PO6	PS O 1	PS O 2
CO 1	-	1	1	2	-	1	1	1
CO 2	2	1	2	-	1	2	-	2
CO 3	2	1	-	-	1	-	2	-
CO 4	-	3	3	1	2	-	3	-

**BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-306B: Consumer Behavior**

CO 1	To recognize the stages pertaining to human behaviour while identifying factors influencing consumer decision process
CO 2	To establish the relevance of consumer behaviour theories and concepts to marketing decisions.
CO 3	To apply conceptual models in order to be acquainted with psychology of consumers.
CO 4	To evaluate the factors influencing consumer buying behaviour with regards to Culture, Subculture and Social Class

Pos C o s	PO 1	PO 2	PO 3	PO4	PO 5	PO6	PS O 1	PS O 2
CO 1	-	1	1	2	-	1	1	1
CO 2	2	1	2	-	1	2	-	2
CO 3	2	1	-	-	1	-	2	-
CO 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-306C: Organizational Design and Structure

CO 1	Recognize the concepts, need and importance of management and application of the various principles of management.
CO 2	Examine the process of management and the various components of management process (Planning, Organizing, Staffing, Directing, and Controlling)
CO 3	Predict, adopt and integrate the individual behaviour with the organizational behaviour.

CO 4	Assess various components of individual behaviour and how it helps an organization in bringing in the organizational development
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Pos Cours es	PO 1	PO 2	PO 3	PO4	PO 5	PO6	PS O 1	PS O 2
CO 1	-	1	1	2	-	1	1	1
CO 2	2	1	2	-	1	2	-	2
CO 3	2	1	-	-	1	-	2	-
CO 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
BBA-306D: Export Import Procedure and Documentation

CO 1	To discuss various export import procedures and documentation
CO 2	To demonstrate frameworks for clearance
CO 3	To analyze the strategies available for firms pertaining to claim and insurance
CO 4	To evaluate the provisions of various export and import regulatory bodies

P o s c o s	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P S O 1	P S O 2
C O 1	-	1	1	2	-	1	1	1
C O 2	2	1	2	-	1	2	-	2
C O 3	2	1	-	-	1	-	2	-
C O 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
MG-310E: Financial Planning and Performance

CO 1	To recognize the strategic planning
CO 2	To understand the cost and variance analysis.
CO 3	To analyse the Key performance indicators
CO 4	To evaluate the various performance measures

P o s C o s	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P S O 1	P S O 2
C O 1	-	1	1	2	-	1	1	1
C O 2	2	1	2	-	1	2	-	2
C O 3	2	1	-	-	1	-	2	-
C O 4	-	3	3	1	2	-	3	-

BACHELOR OF BUSINESS ADMINISTRATION (BBA)
MG-302: International Business

CO1: Become familiar with global business environment

CO2: Understand various the international trade theories & trade agreements.

CO3: Know the different forms of international business, structures and process of controlling international business

CO4: Become aware of the different supply chain strategies and techniques of investment decisions in international business

Pos Courses	PO 1	PO 2	PO 3	PO4	PO 5	PO6	PS O 1	PS O 2
CO 1	-	1	1	2	-	1	1	1
CO 2	2	1	2	-	1	2	-	2
CO 3	2	1	-	-	1	-	2	-
CO 4	-	3	3	1	2	-	3	-

LINGAYA'S VIDYAPEETH

SCHEME OF MBA

SESSION: 2021-23

MBA Year (2021-23)

Programme Educational Objectives (PEO)

PEO1 : Develop into socially responsible and value driven people who are committed to long term development.

PEO2 : To make managerial decisions, develop a creative, imaginative and entrepreneur mentality. PEO3 :

Ability to adapt to a rapidly evolving, dynamic market climate and a desire to learn new skills. PEO4 : Provide advanced management skills for work and lifelong learning

Mapping of PEOs with Mission Statements

PEO Statements	School Mission 1	School Mission 2	School Mission 3	School Mission 4
PEO1:	2	2	1	2
PEO2:	3	2	-	1
PEO3:	1	2	2	-
PEO4:	2	3	2	1

Enter correlation levels 1, 2, or 3 as defined below:

- 1. Slight (Low)**
- 2. Moderate (Medium)**
- 3. Substantial (High)**

If there is no correlation, put “-“

Program Outcomes (PO's)

PO's - MBA

PO1- Market Climate and domain knowledge: Indian businesses economic, legal and social environment. Graduates will be able to increase their understanding and knowledge of how global and local business operates. This aids in the recognition of business operations, the identification of future business opportunities, the evolution of business enterprises and the exploration of business opportunities.

PO2- Competencies in quantitative and qualitative approaches for critical thought, business analysis, problem solving and innovative solutions. Graduates should be able to analyze business data, apply applicable research and solve problems in a variety of functional fields including marketing, business management and human resources.

PO3- Demonstrate a global perspective and the ability to recognize facets of global business and cross- cultural understanding.

PO4 – Developing responsiveness to contextual social issues / problems and finding solutions, learning business ethics and overcoming ethical dilemmas are all examples of social responsiveness and ethics. Graduates should be able to recognize current social issues, explore possibilities for social entrepreneurship, design business solutions and illustrate ethical practices in the workplace.

PO5- Effective communication: Graduates should be able to communicate effectively orally and in writing, especially in business settings, using appropriate technology (business presentations, digital communication, social media platforms).

PO6- Understanding leadership: Graduates should be able to work and lead teams across organizational borders, demonstrate leadership qualities and optimize the use of team members diverse skills in the background.

PSO's - MBA

PSO1 – Having the ability to specialize in a management discipline.

PSO 2- Demonstrate sufficient expertise, skills and experimental learning in the field of management.

Mapping of Program Outcome with Program Educational Objectives MBA

	PEO 1	PEO 2	PEO 3	PEO 4
PO1	1	3	2	3
PO2	1	3	2	2
PO3	1	2	3	2
PO4	3	1	2	1
PO5	1	1	2	2
PO6	1	2	3	2
PSO1	1	3	2	2
PSO2	1	2	1	2

1. Slight (Low)

2. Moderate (Medium)

3. Substantial (High)

MBA: 2021-2023

MBA-101: FOUNDATIONS OF MANAGEMENT

CO 1 Recognize the concepts, need and importance of management and application of the various principles of management.

CO 2 Know the different types of plans, how to plan & various decision making techniques

CO 3 Understand about organizing –using the appropriate organization structure & factors influencing organization structures.

CO 4 Know the techniques of control to improve the performance.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2
CO1	2	1	-	2	-	-	3	1
CO2	3	2	-	1	-	1	2	2
CO3	1	-	2	2	-	-	3	2
CO4	2	1	-	1	1	1	1	1

MBA: 2021-2023

MBA-103: MANAGERIAL ECONOMICS

●

CO 1 Capable to analysis fundamentals of managerial economics such as demand, Opportunity Cost, Demand forecasting of new product.

CO 2 Understand the concept of various production functions.

CO 3 Examine the concepts of cost, production, price & output decisions of firms under the various market structure and their relationship to business operations.

CO 4 Determine the concepts money market, national income, consumption function, inflation and trade cycles.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2
CO1	2	2	-	2	1	1	2	2
CO2	1	2	-	1	-	-	2	1
CO3	1	2	-	1	-	-	2	2
CO4	2	1	1	1	-	-	2	2

MBA: 2021-2023

MBA-105: ACCOUNTING FOR MANAGERS

CO1 Understand the branches, principles & standards of accounting and also analyze the role of accounting in organizations.

CO2 Know the practical applications for managerial Decision making with special reference to pricing, and selection of Sales-Mix.

CO3 Knowledge about funds flow and cash flow analysis by preparing Funds Flow Statement and Cash Flow Statements

CO4 Analyze the recent developments in accounting and financial Reporting and Regulation.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2
CO1	2	3	1	-	-	1	2	2
CO2	2	2	1	-	-	1	2	2
CO3	2	2	1	-	-	-	2	2
CO4	2	2	1	-	-	-	2	2

MBA: 2021-2023

MBA-107: BUSINESS ENVIRONMENT AND INDIAN ECONOMY

CO1: Analyze the knowledge related to environmental forces influencing the business.

CO2: Developing understanding of Company Regulatory Legislation in India.

CO3: Understand the framework of Indian Economy, .

CO4: Evaluate the various development strategies in India.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2
CO1	3	2	2	1	-	-	2	2
CO2	3	2	2	1	-	-	1	2
CO3	2	2	2	1	-	-	1	2
CO4	2	2	-	1	-	-	1	2

MBA: 2021-2023

MBA-109: BUSINESS ETHICS AND CORPORATE SOCIAL

CO 1 Discuss the importance of Indian Ethos and its managerial practice for the organizations

CO 2 Examine the importance and relevance of ethical considerations in marketing, ethics in accounting and finance.

CO 3 Identify the drivers of CSR, Corporate Governance, Business Ethics and

CSR. CO 4 Understand the environmental aspects of CSR.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2
CO1	2	1	2	3	-	-	2	2
CO2	2	1	2	3	-	-	1	1
CO3	2	1	2	3	-	-	1	1
CO4	2	1	2	3	-	-	1	1

MBA: 2021-2023

BS-111: QUANTITATIVE TECHNIQUES

CO1: Understand the various terms used in statistics.

CO2: Apply appropriate quantitative technique according to nature of data.

CO3: Analyze the Formulation of linear programming problems.

CO4: Gain knowledge about formulation of linear programming problems.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2
CO1	2	3	-	-	1	-	2	2
CO2	2	3	-	-	1	-	1	1
CO3	2	3	-	-	1	-	1	1
CO4	2	3	-	-	1	-	1	1

SEMESTER II

MBA: 2021-2023

MBA-102:Business Analytics for Decision Making

- CO 1 Develop understanding related to analytics and davenport article .
- CO 2 Create appropriate knowledge about dealing with missing or incomplete data.
- CO 3 Recognize the concept of Loveman article – Diamonds in the Data Mine,
- CO 4 Understand the basis optimization use of excel to solve business problems.

Pos Cos	PO1	PO2	PO13	PO4	PO5	PO6	PSO 1	PSO2
CO1	3	3	1	-	-	-	3	2
CO2	3	3	1	-	-	-	1	2
CO3	3	3	1	-	-	-	1	2
CO4	3	3	1	-	-	-	1	2

CO1: Understand the role of human resources management and HR as a factor of Competitive Advantage. CO2: Demonstrate knowledge of practical application of training and employee development. CO3: Understand the role of Career Choices and Preferences of employees. CO4: Ability to analyze and manage work life balance, quality of work life.

PosCos	PO 1	PO2	PO3	PO 4	PO 5	P O 6	PS O1	PS O2
CO1	3	3	2	2	-	1	3	3
CO2	2	3	2	2	-	1	3	3
CO3	2	2	2	2	-	-	2	1
CO4	2	2	2	2	-	-	2	1

MBA: 2021-2023

MBA-106: MARKETING MANAGEMENT

L-3 T-0 P-0

CO1 Understand the concepts of marketing, marketing environment and planning

CO2 Gain understanding of model of consumer behavior.

CO3 Recognize the levels and bases for segmentation, targeting and positioning.

CO4 To analyze how facets of marketing mix interact and in turn lead to creation of customer value.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2
CO1	3	3	3	1	2	-	3	2
CO2	3	3	3	1	1	-	3	2
CO3	3	3	3	1	1	-	3	2
CO4	3	3	3	1	1	-	3	2

MBA: 2021-2023

MBA-108 :PRODUCTION AND OPERATIONS MANAGEMENT

CO1: Recognize the factors that affect system and concept of production and operation management.

CO2: Develop understanding of production planning and control in mass production, batch production.

CO3: Know the various scheduling and measuring production activities.

CO4: Describe various material and inventory controls.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2
CO1	3	2	1	-	-	-	3	2
CO2	2	3	1	-	-	-	3	2
CO3	2	3	1	-	-	-	2	2
CO4	2	3	1	-	-	-	2	2

MBA: 2021-2023

MBA-110: CORPORATE FINANCE & INDIAN FINANCIAL SYSTEM

CO 1 Enlighten the with the Concepts and Practical dynamics of Financial Services. CO 2 Examine the Capital Structure Decision-Capital Structure Theories.

CO 3 Analyse the methods for financing of working capital.

CO 4 Recognize the Financial sector reforms-major reforms in the last decade.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2
CO1	3	3	2	-	-	-	2	3
CO2	3	3	2	-	-	-	2	3
CO3	3	3	2	-	-	-	2	2
CO4	3	3	2	-	-	-	2	1

MBA: 2021-2023

MBA-112: ENTREPRENEURSHIP & PROJECT MANAGEMENT

CO1: Identify conceptual model of entrepreneurship.

CO2: Know the role of small business in modern Indian economy.

CO3: Understand how to prepare a real time project feasibility report containing technical appraisal. CO4: Develop knowledge to prepare project report.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2
CO1	2	3	2	1	-	2	2	2
CO2	2	3	2	-	-	2	2	2
CO3	2	3	2	1	-	2	2	2
CO4	3	3	2	-	-	2	2	2

MBA: 2021-2023
CS-110: Computer Application For Business

CO 1 Describe insights regarding computer fundamentals.

CO 2 Discuss various fundamental concepts of internet working techniques with their characteristics and understand the requirements for WWW techniques.

CO 3 Assess application word processing concepts.

CO 4 Develop understanding to prepare spreadsheet and its business applications

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2
CO1	3	-	1	-	-	-	1	1
CO2	2	-	1	-	-	-	1	1
CO3	-	-	1	-	-	-	1	1
CO4	-	-	1	-	-	-	1	1

MBA: 2021-2023
ML-102: Legal Environment For Business

CO 1: Analyze the concept of Law and Business, .

CO 2: Recognize the law of Contracts.

CO 3: Understand the ethical foundations, ethical misconduct.

CO 4: Understand the various forms of Business Organizations.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO2
CO1	3	2	-	-	-	-	2	2
CO2	2	2	-	-	-	-	2	2
CO3	2	2	-	-	-	-	2	2
CO4	2	2	-	-	-	-	2	2

MBA: 2021-2023

MBA-201 :ORGANIZATIONAL BEHAVIOUR AND DESIGN

Course Outcome

CO1: Able to relate the different aspects of the human behavior to the individual, group & organizational perspectives of the workplace.

CO2: To apply the frameworks & tools effectively to analyze & approach various Organizational situations.

CO3: Able to modify their own beliefs, assumptions, and behaviors with respect to how individuals, groups and organizations act in order to expand the options of approaches and increase the own effectiveness.

CO4: To Analyze the behavior of individuals and groups in organizations. **CO5:** To develop conceptual understanding of change and its implementation.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	1	1	1	1	1	-	2	1
CO2	2	2	2	2	2	2	2	2
CO3	1	3	2	2	1	2	3	2
CO4	2	2	1	2	1	2	1	2
CO5	3	3	2	1	2	1	2	1



MBA: 2021-2023

MBA-203 : MARKETING RESEARCH

CO 1 : Discuss the significance of concepts & theories of marketing research.

CO 2 : Analyse the concepts of various marketing designs.

CO 3 : Demonstrate analytical skills in identification of types of questionnaire and designing them.

CO 4 : Evaluate and interpret the data preparation.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	3	1	1	2	1	1	2	3
CO2	2	3	1	2	1	2	1	3
CO3	2	3	1	2	1	1	3	3
CO4	2	2	2	3	1	3	2	3

MBA: 2021-2023

MBA- 205 (A) :Employee Relations

CO1 : To understand the concept of employee relations.

CO2 : Analyse the concept of performance & and evaluate its deficiencies.

CO3 : To demonstrate the employee conduct and grievances.

CO4 : Evaluate the third party actions and prepare reviews.

CO'S/ PO'S	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	1		3		3		2	
CO2		2						
CO3	2					1		
CO4			1		2			3

MBA: 2021-2023
MBA- 205 (B) :Organizational Change & Management

CO1 : To Understand the concept of IHRM.

CO2 : Analyse the cross cultural negotiations.

CO3 : To evaluate the concept of international business approaches.

CO4 : To evaluate the concept of change management and international labour.

CO'S/ PO'S	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	1	1	2		3	2	3	
CO2	1			3				
CO3	2					1	2	
CO4			1		2			2

Financial Management

MBA: 2021-2023

MBA- 209(B) : Portfolio Management

CO1 : Understanding the concept of global financial markets & instruments

CO2: To analyse the portfolio selection & risk management

CO3: Evaluate the process of portfolio selection

CO4: To evaluate and interpret the strategies of investment and portfolio analysis

CO'S/ PO'S	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	1		3		3	2	2	1
CO2		2		3				
CO3	2	1	2			1	1	2
CO4			1		2			3

Financial Management

MBA: 2021-2023

MBA- 209(A)

MANAGEMENT OF FINANCIAL SERVICES

L-T-P: 3-0-0

CO1: Explain the concept of fundamental financial concepts, especially time value of money.

CO2: Apply capital budgeting projects using traditional methods.

CO3: Analyze the main ways of raising capital and their respective advantages and disadvantages in different circumstances.

CO4: Integrate the concept and apply the financial concepts to calculate ratios and do the capital budgeting in business.

Pos Cos	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	PS O1	PS O2
CO 1	2	1	3	3	2	2	3	2
CO 2	1	3	1	1	-	1	1	3
CO 3	2	1	1	-	2	2	1	3
CO 4	2	1	2	-	2	2	2	3

CO3 International Business

MBA: 2021-2023

MBA- 209(B)

International Finance and Financial Derivatives

L-T-P: 3-0-0

Course Outcomes:

CO1: Identify the money market instrument

CO2: Demonstrate analytical skills to address relevant issues relating to financial services industry

CO3: Distinguish various types of financial markets

CO4: Understand various concepts related to financial management.

P o s C o s	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PS O1	PS O2
CO1	2	2	2	1	1	1	-	2
CO2	1	3	1	1	2	3	3	3
CO3	3	2	1	-	1	2	2	2
CO4	3	1	-	2	1	1	3	2

Marketing Management

MBA: 2021-2023

MBA- 207(A)

Services Marketing

L-T-P: 3-0-0

CO1: To understand and explain the nature and scope of services marketing and present about this in a professional and engaging manner.

CO2: To explain the significance of services marketing in the global economy and the deeper aspects of successful services marketing. also found challenges and opportunities in services marketing

CO3: To understand the expectations of customers and know how to translate this knowledge into genuine value for customers

CO4: To understand current research trends in services marketing and management

P o s C o s	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P S O 1	P S O 2
	C O 1	3	1	1	2	-	1	1
C O 2	2	1	3	3	1	2	2	3
C O 3	2	1	-	2	2	1	2	1
C O 4	-	3	3	1	2	-	3	-

Marketing Management

MBA: 2021-2023

MBA- 207(B) Consumer Behavior & Advertising Management

L-T-P: 3-0-0

CO1. Demonstrate the alternative ways of thinking about consumers as individuals and able to use quantitative and qualitative research methods on consumer behaviour.

CO2. Interpret the role of personality and learning in consumer behavior.

CO3. Analyze social and cultural factors that effect consumer behaviour.

CO4. Develop marketing strategies that are consumer based and also create and enhance customer value.

P o s s i b l e	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PS O1	PS O2
CO1	2		2	1	1	1	1	3
CO2	1	3	1	2				1
CO3	3		3	-		1		
CO4		1	-	2	1	1	2	1

Business Analytics

MBA: 2021-2023

Data Science using R

L-T-P: 3-0-0

MBA-213(B)

- CO1: Learn the basics of data analysis with R
 CO2: Understand the practical use of R tool
 CO3: Evaluating the exploratory data
 CO4: Developing the techniques of data calculation.

Pos Co s	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO 2
CO1	3	1	1	2	-	1	1	1
CO2	2	1	3	3	1	2	2	3
CO3	2	1	-	2	2	1	2	1
CO4	-	3	3	1	2	-	3	-



SEMESTER IV

MBA: 2021-2023

MBA-202

CORPORATE STRATEGIC PLANNING

L-T-P: 3-1-0

CO1: To understand the concept of strategy, its process, SWOT analysis.

CO2: To learn the formulation of strategy and choice of alternatives.

CO3: Analyse the concept of strategy formulation

CO4: Evaluate the strategies and its techniques.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO 2
CO1	3	1	1	3	-	1	-	1
CO2	1	1	-	-	1	2	2	-
CO3	2	1	-	2	2	1	2	1
CO4	-	3	3	1	2	-	-	-

MBA: 2021-2023

MBA- 204

Business process reengineering

L-T-P: 3-1-0

CO1: To understand the concept of business process reengineering.

CO2: To learn the major issues in process redesign.

CO3: To evaluate the designing and building a prototype of new process

CO4: Implement the change management.

CO5: Implementation of BPR

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO 2
CO1	3	1	1	2	-	1	1	1
CO2	2	1	3	3	1	2	2	3
CO3	2	1	-	2	2	1	2	1
CO4	-	3	3	1	2	-	3	-
CO5	1	2	1	-	-	1	-	2

MBA: 2021-2023

MBA- 266

Dissertation

L-T-P: 0-0-16

MBA: 2021-2023

MBA- 206(A)

Strategic HRM and Leadership

L-T-P:3-0-0

CO1: Synthesize the role of human resources management as it supports the success of the organization including the effective development of human capital as an agent for organizational change.

CO2: Apply Knowledge of concept / fundamentals for different types of models.

CO3: Synthesizing different techniques of Training and Development in finding suitable candidate.

CO4: Understand HR implications of organizational strategies

Pos Cours s	PO 1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO 2
CO 1	1	1	1	2	3	2	-	2
CO 2	3	1	2	2	1	1	3	3
CO 3	1	3	1	3	3	1	3	3
CO 4	1	1	3	2	1	3	2	2

MBA: 2021-2023

MBA- 208(A)

Diversity and Inclusion of HR Professionals

L-T-P: 3-0-0

CO1: Understand the concept of talent management.

CO2: To learn about the best practices for talent management.

CO3: Analyse the talent management in different context.

CO4: Evaluate the concept of diversity & talent.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO 2
CO1	3	1	1	2	-	1	1	1
CO2	-	-	3	-	1	-	-	-
CO3	2	1	-	-	1	1	-	1
CO4	-	3	2	1	2	-	3	-

MBA: 2021-2023

MBA- 210(A)

Personal Financial Management

L-T-P: 3-0-0

CO1: To understand the basics of finance and assess the cash flows.

CO2: To learn the process of budgeting

CO3: Analyses the investment strategies

CO4: Evaluate the tools for calculation of finances.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO 2
CO1	2	1	1	2	-	1	-	-
CO2	-	1	-	-	1	1	-	2
CO3	2	1	-	2	2	1	1	1
CO4	-	3	3	1	2	-	-	-

MBA: 2021-2023

MBA- 210(B)

Taxation

L-T-P: 3-0-0

CO1: To learn the overview of business taxation

CO2: Understand the concept of corporate income taxation

CO3: Analyse the topic of corporate income taxation

CO4: Evaluate the corporate non-liquidating distributions

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO 2
CO1	3	1	1	2	-	1	1	1
CO2	2	1	3	-	1	2	-	3
CO3	2	1	-	2	2	1	-	1
CO4	-	3	3	1	2	-	3	-

MBA: 2021-2023

MBA- 212(A) International Trade (Practices, Procedures and Documentation) L-T-P: 3-0-0

Course Outcome

CO1. Explain the concepts in trade documentation in international business with respect to foreign trade

CO2. Apply the current business phenomenon and to evaluate the global business environment in terms of economic, social and legal aspects

CO3. Analyse the principle of international business and strategies adopted by firms to expand globally

CO4. Integrate concept in international business concepts with functioning of global trade

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO 2
CO1	3	3	1	2	2	1	2	1
CO2	3	3	2	-	1	2	3	-
CO3	3	2	1	1	3	3	-	2
CO4	2	1	3	1	2	-	1	-

MBA: 2021-2023

MBA- 210(B)

Total Quality Management

L-T-P: 3-0-0

CO1: Understand the basics of TQM

CO2: To learn the documentation of TQM

CO3: Analyse the methods of TQM

CO4: Evaluate the redefining & restructuring of processes.

Pos Cos	PO 1	PO 2	PO 3	PO4	PO 5	PO6	PSO 1	PSO 2
CO 1	1	1	1	2	-	1	1	1
CO 2	1	1	2	3	1	3	2	1
CO 3	2	1	-	2	2	2	2	1
CO 4	-	3	3	1	2	-	1	-

MBA: 2021-2023

MBA- 206(A)

Retail Management

L-T-P: 3-0-0

- CO1: Understand the basics of retail marketing
CO2: Learn the strategy of retail marketing
CO3: To analyse the promotional techniques.
CO4: Evaluate the various layout and design of marketing.

Pos Co s	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO 2
CO1	3	1	1	2	-	1	1	1
CO2	2	1	3	3	1	2	2	3
CO3	2	1	-	2	2	1	2	1
CO4	-	3	3	1	2	-	3	-

- CO1** DEFINE various concepts related to Digital Marketing.
- CO2** EXPLAIN the role of Facebook, Google Ad words, Youtube and Email in digital marketing.
- CO3** MAKE USE OF Facebook, Google Ad words, Youtube and Email for carrying out digital marketing of real life products.
- CO4** ILLUSTRATE the use of Facebook, Google Ad words, Youtube and Email in various contexts of Digital Marketing.

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	3	2	1	-	1	1	2	1
CO2	-	2	3	-	1	3	1	2
CO3	1	2	1	1	-	2	2	3
CO4	-	3	2	-	1	2	2	2

MBA: 2021-2023

MBA- 214 (B)

Business Forecasting

L-T-P: 3-0-0

CO1: Understand the process of forecasting

CO2: To learn the Exploratory Data Analytics

CO3: To analyse the Time Series Modeling using Regression

CO4: Evaluate the Time Series Decomposition

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	1	-	1	-	2	-	-	2
CO2	-	-	2	-	1	3	1	-
CO3	1	1	1	1	-	1	1	-
CO4	-	2	2	-	1	-	-	1

MBA: 2021-2023

MBA- 214(A)

Marketing Analytic

L-T-P: 3-0-0

CO1: Understanding the concept of marketing analytics

CO2: Learn the product analytics concept

CO3: Analyse the customer analytics

CO4: Evaluate the emerging issues in marketing analytics

Pos Cos	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	1	1	1	-	1	1	2	1
CO2	-	2	2	-	2	-	1	1
CO3	2	1	1	1	-	2	2	3
CO4	-	-	1	-	1	2	2	1

Program Outcomes (PO's)

PO's - MBA

PO1- Market Climate and domain knowledge: Indian businesses economic, legal and social environment. Graduates will be able to increase their understanding and knowledge of how global and local business operates. This aids in the recognition of business operations, the identification of future business opportunities, the evolution of business enterprises and the exploration of business opportunities.

PO2- Competencies in quantitative and qualitative approaches for critical thought, business analysis, problem solving and innovative solutions. Graduates should be able to analyze business data, apply applicable research and solve problems in a variety of functional fields including marketing, business management and human resources.

PO3- Demonstrate a global perspective and the ability to recognize facets of global business and cross- cultural understanding.

PO4 – Developing responsiveness to contextual social issues / problems and finding solutions, learning business ethics and overcoming ethical dilemmas are all examples of social responsiveness and ethics. Graduates should be able to recognize current social issues, explore possibilities for social entrepreneurship, design business solutions and illustrate ethical practices in the workplace.

PO5- Effective communication: Graduates should be able to communicate effectively orally and in writing, especially in business settings, using appropriate technology (business presentations, digital communication, social media platforms).

PO6- Understanding leadership: Graduates should be able to work and lead teams across organizational borders, demonstrate leadership qualities and optimize the use of team members diverse skills in the background.

PSO's - MBA

PSO1 – Having the ability to specialize in a management discipline.

PSO 2- Demonstrate sufficient expertise, skills and experimental learning in the field of management

Bachelor Of Vocational Studies Program Outcomes (POs) for B.Voc

PO1	Disciplinary Knowledge: Demonstrate comprehensive knowledge of one or more disciplines that form a part of an undergraduate B.Voc programme Execute strong theoretical and practical understanding generated from the chosen B.Voc programme.
PO2	Critical Thinking and Problem solving: Exhibit the skill of critical design thinking and use them to predict a range of creative solutions towards a design problem, evaluate them and choose the most appropriate options.
PO3	Social Competence Exhibit thoughts and ideas effectively in writing and orally; communicate with others using appropriate media, build effective interactive and presenting skills to meet global competencies and connect to people individually or in group settings.
PO4	Research-Related Skills: Demonstrate a sense of inquiry and capability for asking relevant/appropriate questions; ability to plan, execute and report the results of an experiment Employ knowledge of the avenues for research and higher academic achievements in the chosen field and allied subjects and aware about research ethics, intellectual property rights and issues of plagiarism.
PO5	Personal and Professional competence: Perform independently and participates in team activities and demonstrates cooperation. Integrate enthusiasm and commitment to improve personal and team performance levels and build skills to achieve the goals.
PO6	Effective Citizenship and Ethics : Demonstrate empathetic social concern and equity centred national development; ability to act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.
PO7	Environment and Sustainability: Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.
PO8	Self-directed and Life-long learning: Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.
PO9	Trans-disciplinary Research competence: Create new conceptual, theoretical, methodological innovations that integrate and transcend beyond discipline-specific approaches to address a common problem.

BVOC (Cardiac Care Technology) 1st Sem

Course Code	Course Name	Content Type	Credit
BVCCT-101	Human Anatomy and Physiology -1	General	4

Unit -1

anatomical Position



Facing the observer, head level, eyes facing forward.



This is what the image in the book looks like

-

Prone: facing face down, Supine: facing face up

-

Superior: upper part of the body

-

Inferior: lower part of the body

-

Anterior: near to or at the front

-

Posterior: near to or the back of the body

-

Medial: midline (think of the body being divided into 2)

-

Lateral: far from midline (away from the center)

-

Intermediate: between 2 structures

-

Lpsilateral: same side of the body as another structure



Contralateral: on the opposite side of another structure



Proximal: close to where the structure originates. Near to the attachment of a limb



Distal: away from the attachment of a limb to the trunk



Superficial: toward or on the surface of the body



Deep (internal): away from surface of the body

Terminology and General Plan of the Body, Body Parts and Areas, Terms of Location and Position, Body Cavities and Their Membranes, Dorsal cavity, Ventral cavity, Planes and Sections, Cells: Structure, function and location, Prokaryotic and eukaryotic cells, Cell organelles, Cell division.

UNIT-2

Tissue, Types, Structure, Location and Function of Epithelial Tissue, Connective Tissue, Muscle Tissue, Nerve Tissue, Membranes, Glandular tissue The Integumentary System: structure and function of The Skin, Subcutaneous Tissue, Musculoskeletal System: Basic anatomy of important muscles and bones.

UNIT-3

Cell physiology: Structure, membrane, transport across cell membrane, Active, Passive, Organization of the Body, Body Composition, Body Fluid Volumes and its measurement, Diffusion, Osmosis, Tonicity, Homeostasis

UNIT-4

Blood-composition, function, cellular component & their function, haemoglobin & anaemia, blood groups and coagulation

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Explain the gross morphology, structure and functions of various organs of the human body.

CO 2. Describe the various homeostatic mechanisms and their imbalances.

CO 3. Identify the various tissues and organs of different systems of human body.

CO 4. Demonstrate the various experiments related to special senses and nervous system.

CO 5. Evaluate coordinated working pattern of different organs of each system.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	3	3	3	2	2	3
CO 5	3	3	3	3	2	3	2	3	3

Course Code	Course Name	Content Type	Credit
BVCCT-102	General Biochemistry	General	4

UNIT 1

Carbohydrates- Glucose; fructose; galactose; lactose; sucrose; starch and glycogen (properties and tests, Structure and function), Metabolism of carbohydrate

UNIT 2

Proteins -Amino acids, peptides, and proteins (general properties & tests with a few examples like glycine, tryptophan, glutathione, albumin, hemoglobin, collagen)

UNIT 3

Lipids- Fatty acids, saturated and unsaturated, cholesterol and triacylglycerol, phospholipids and plasma membrane

UNIT 4

Vitamins -General with emphasis on A, B2, C, E and inositol (requirements, assimilation and properties)

Minerals--Na, K, Ca, P, Fe, Cu and Se (requirements, availability and properties)

UNIT 5

Nucleotides and nucleic acids DNA, Replication Organ function test: LFT, KFT, Gastric function test, Cardiac function test.

Course Outcomes:

Upon completion of this course the student will be able to:

- CO 1.** Describe the importance of chemistry of carbohydrates
CO 2. Classify and understand the importance of amino acid chemistry
CO 3. Explain the importance of chemistry of lipids .
CO 4. Identify and understand the importance of vitamins
CO 5. Explain the chemistry of nucleic acid

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3
CO 5	3	3	3	2	3	3	2	3	2

Course Code	Course Name	Content Type	Credit
BVCCT-103	Orientation in para clinic science	Skill	4

UNIT-1

Entamoeba Histolytica, Leishmania, Material Parasites of man, Helminthology Taenia Saginata, Taenia Soleum,

UNIT-2

Echinococcus granulosus, Ascaris Lumbricoides ancylostoma Duodenale Strong ylides stercoralis.

UNIT-3

General Properties of Virus, Herpes virus, Poliovirus, Hepatitis virus, Onco Generic Virus, HIV

UNIT-4

Inflammation, Neoplasia, Osteomyelitis, Fractures, Osteoporosis, Ricketts.

Course Outcomes:**Upon completion of this course the student will be able to:**

- CO 1.** Complete knowledge and practical skills in identifying various diseases.
CO 2. To identify these parasites using various diagnostic methods and interpret associated laboratory findings.
CO 3. Analyze the impact of viral infections on public health and global disease burden.
CO 4. Recognize the clinical manifestations, diagnostic criteria, and prognostic factors associated with inflammation, neoplasia, and bone disorders.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	2	2	3	1	1
CO 2	2	2	2	1	1	2	3	2	3

CO 3	3	2	1	3	2	3	3	2	3
CO 4	3	2	1	2	2	3	2	2	3

Course Code	Course Name	Content Type	Credit
BVCCT-104	Basic Electrography	Skill	3

UNIT-1

Fundamental principles of electrocardiography: Cardiac electrical field Generation during activation, Cardiac wave fronts Cardiac electrical field Generation during ventricular recovery

UNIT-2

Electrocardiographic lead systems: Standard limb leads, Precordial leads and the Wilson central terminal, Augmented limb leads. The hexaxial reference frame and electrical axis Recording adult and pediatric ECGs.

UNIT-3

The normal electrocardiogram, Atrial activation. The normal P wave Atrial repolarization Atrioventricular node conduction and the PR segment Ventricular activation the QRS complex Ventricular recovery and ST-T wave, U wave Normal variants, Rate and rhythm

Course Outcomes:

Upon completion of this course the student will be able to:

- CO 1.** Understand the fundamental principles of electrocardiography, including the generation of the cardiac electrical field during activation and ventricular recovery.
- CO 2.** Identify the hexaxial reference frame and its role in determining the electrical axis of the heart.
- CO 3.** Explain the PR segment, reflecting AV node conduction, and assess its duration for potential conduction abnormalities.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	2	2	3	2	2
CO 2	3	2	2	2	2	2	3	2	3
CO 3	3	2	2	3	2	3	3	2	3
CO 4	3	2	2	2	2	3	2	2	3

Course Code	Course Name	Content Type	Credit
BVCCT-105	Fundamentals of computer	General	3

Unit-1

Introduction to Computers, History of Computer, Generations, Characteristics, Advantages and limitations of Computer, Classification of Computers, Functional Components of Computer, input, Output and Processing, Concept of Hardware and Software, Data & Information. Concept of data storage. Number system. Decimal, Binary, Hexadecimal ASCII.

UNIT-2

Introduction to GUI Based Operating System Basics of Operating system, Basics of DOS & LINUX, The User interface, File and directory management, Windows setting, Control Panel, devices and Printer setting, Using various window commands for desktop.

UNIT-3

Word Processing, Word processing basics, Menu Bar, Opening and closing documents, save & save as, Page setup, print preview, and printing. Text creation and manipulation Editing, cut copy paste. Document creation, editing, Formatting the text – Paragraph indenting, bullets and numbering, changing case, Table manipulation – creation of table, insertion and deletion of cell, row and column.

UNIT-4

Network basics, Internet Basics of computer network LAN, WAN etc, Concept of Internet, Basic of Internet Architecture, Services on Internet Architecture, World wide web and websites, Communication on Internet, Internet Services, Preparing Computer for Internet Access, ISPs and Examples, Internet Access Technologies. Web Browsing, configuring web browser, Popular search engines Downloading and printing web pages. Internet application Basics of E-mail, E-mail addressing, forwarding and searching, Composing.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Identify the functional components of a computer system, including input devices, output devices, and central processing units.

CO 2. Apply knowledge of operating system basics to troubleshoot common issues and optimize system performance.

CO 3. Demonstrate proficiency in creating and manipulating text, including editing, cutting, copying, and pasting.

CO 4. Demonstrate proficiency in communication on the Internet, including sending and receiving emails and using messaging services.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	2	2	3	2	2
CO 2	3	2	2	2	2	2	3	2	3
CO 3	3	2	2	3	2	3	3	2	3
CO 4	3	2	2	2	2	3	2	2	3

Course Code	Course Name	Content Type	Credit
BVCCT-106	General English and soft skill	General	2

Unit-1 Introduction to English language

- Role and significance of English language in the present scenario
- English language: its relevance for the Indian industry.
- Introduction to listening, speaking, reading, writing and bench marking of the class.

Unit 2: Grammar and usage

Verbs

Determiners

Active Voice and Passive Voice

Tenses

Unit 3:

Letter writing & Notice Writing

Unit 4:

Précis and Report writing

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Recognize the relevance of English language proficiency for the Indian industry, particularly in sectors such as information technology, business process outsourcing, and international trade.

CO 2. Demonstrate proficiency in using different grammatical structures, including sentence types, verb forms, and agreement.

CO 3. Apply knowledge and skills acquired in letter and notice writing to real-world scenarios, such as job applications, invitations, or announcements.

CO 4. Apply précis and report writing skills in academic, professional, and organizational settings to communicate information effectively and persuasively.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	3	3	3	2	2	3
CO 5	3	3	3	3	2	3	2	3	3

Course Code	Course Name	Content Type	Credit
BVCCTP-101	Human Anatomy and Physiology -1 Lab	Skill	2

Human anatomy (practical)

Demonstration of

- Study of Human Skeleton parts with skeletal models.
- Study with charts and models of all organ systems mentioned above.
- Microscopic slides examination of elementary human tissues, cells.
- Major organs through models and permanent slides.
- Parts of circulatory system from models.
- Parts of respiratory system from models.
- Digestive system from models.

Excretory system from models.

Human Physiology (Practical)

- To measure pulse rate
- To measure blood pressure
- To measure temperature
- Measurement of the Vital capacity

- Determination of blood groups
- Transport of food through esophagus
- Calculation and evaluation of daily energy and nutrient intake.
- Measurement of basal metabolic rate
- Demonstration of ECG
- Bile juice secretion and excretion

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Develop proficiency in using laboratory equipment and techniques for anatomical and physiological experiments, such as microscopy, physiological measurements, and data analysis.

CO 2. To understand the relationship between anatomical structures and their functions in the human body.

CO 3. Develop critical thinking and problem-solving skills through the design and execution of laboratory experiments.

CO 4. Develop practical experience in identifying anatomical structures of the Human Body.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	2	2	3	2	2
CO 2	3	2	2	2	2	2	3	2	3
CO 3	3	2	2	3	2	3	3	2	3
CO 4	3	2	2	2	2	3	2	2	3

Course Code	Course Name	Content Type	Credit
BVCCTP-102	General Biochemistry Lab	Skill	2

General Bio Chemistry Lab

- 1. Analysis of Normal Urine
- 2. Liver Function tests
- 3. Lipid Profile
- 4. Renal Function test
- 5. Blood gas and Electrolytes
- 6. Demonstration of Glucometer with strips

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Interpret lipid profile results to assess cardiovascular risk and lipid metabolism.

CO 2. Develop practical skills in performing biochemical experiments and analyses using laboratory equipment and techniques.

CO 3. Apply quality control measures and standard operating procedures to ensure the accuracy & reliability.

CO 4. Prepare to troubleshoot experimental procedures and equipment issues encountered during biochemical analyses.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Content Type	Credit
BVCCTP-103	Orientation in para clinic science Lab	Skill	2

Orientation In Para Clinic Science Lab

- Know the diagnostic techniques used in pathology
- Know the various categories of the causes of diseases
- Know the course, outcome, consequences of diseases
- Compound Microscope
- Dark ground Microscopy
- Measurement of Microorganisms
- Hanging drop Preparation
- Isolation of Pure Cultures
- Bacterial Staining
- Simple Staining
- Gram's Staining
- Acid Fast Staining
- Albert's Staining
- Capsule Staining

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate knowledge of various diagnostic techniques employed in pathology, including microscopy and staining methods.

CO 2. Classify different categories of disease causes, such as infectious, genetic, environmental, and lifestyle-related factors.

CO 3. Interpret staining results to identify and differentiate between various bacterial species.

CO 4	3	3	3	3	3	3	2	2	3
CO 5	3	3	3	3	2	3	2	3	3

Course Code	Course Name	Content Type	Credit
BVCCTP-105	Fundamentals of computer Lab	Skill	2

Fundamentals of Computer Lab

- Starting MS WORD, Creating and formatting a document,
- Changing fonts and point size,
- Table Creation and operations, Autocorrect, Auto text, spell Check, Word Art, Inserting
- Objects, Page setup, Page Preview, Printing a document, Mail Merge.
- Starting Excel, Work sheet, cell inserting Data into Rows/ Columns, Alignment, Text wrapping , Sorting data, Auto Sum, Use of functions, referencing formula cells in other
- formulae , Naming cells, Generalisation graphs, Worksheet data and charts with WORD, Creating
- Hyperlink to a WORD document, Page set up, Print Preview, Printing Worksheets.
- Starting MS–Power Point,, Creating a presentation using auto content Wizard, Blank
- Presentation, creating, saving and printing a presentation, Adding a slide to presentation,
- Navigating through a presentation, slide sorter, slide show, editing slides, Using Clipart, Word
- Art gallery, Adding Transition and Animation effects, setting timings for slide show, preparing
- Note pages, preparing audience hand-outs, printing presentation documents, MS-Access,
- Creating tables and database, Internet, Use of Internet (Mailing, Browsing, and Surfing).

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate proficiency in using Microsoft Office applications including Word, Excel, PowerPoint, and Access.

CO 2. To understand best practices for organizing files, managing projects, and optimizing workflow using Microsoft Office tools to enhance professionalism and productivity.

CO 3. Apply knowledge of basics of MS Office and its application to troubleshoot common issues.

CO 4. Demonstrate proficiency in effective Utilization of Internet Tools.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

CO 4	3	2	3	2	3	2	3	3	3
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BVOC (Cardiac Care Technology) IInd Sem

Course Code	Course Name	Type of Course	Credits
BVCCT-201	Applied anatomy and physiology related to cardiac technology	Skill	4

Applied Anatomy And Physiology Related To Cardiac Technology

UNIT-1

Introduction to Anatomy (Basic Anatomical terminology)

1. Osteology: Upper limb – clavicle, scapula, humerus, radius, ulna. Lower limb - femur, hipbone, sacrum, tibia, fibula, Vertebral column
2. Thorax: Intercostal space, pleura, bony thoracic cage, ribs, sternum & thoracic vertebrae
3. Lungs: Tracheae, bronchial tree
4. Heart: Surface anatomy of heart, chambers of the heart, valves of the heart, major blood vessels of heart, pericardium, coronary arteries.
5. Myology: Muscles of thorax, muscles of upper limb (arm & fore arm), Flexor and extensor group of muscles (origin, insertion, nerve supply, action)
6. Histology: Types of tissue
 - (a) Epithelia – Squamous, Glandular, Transitional, Cartilage
 - (b) Connective tissue – bone, fibrous tissue, muscle

UNIT-2

1. Overview of the cardiovascular system: Functions of the cardiovascular system, Circulation of blood, Central control of the cardiovascular system
2. Cardiac cycle: Mechanical events, Arterial cycle and central venous pressure cycle, Clinical aspects of human cardiac cycle
3. Cardiac excitation and contraction: Mechanism of contraction, Sino-atrial node function, the cardiac conduction system, Atrio-ventricular node function. Autonomic regulation of the heart rate
4. Assessment of cardiac output: Fick's principle, Thermo dilution and indicator dilution methods, Pulse Doppler methods, Miscellaneous methods
5. Hemodynamics: Relationship between pressure, flow and resistance, Frank-Starling law, Preload, after-load and contractility, Control of stroke volume and cardiac output
6. Solute transport between blood and tissues:

UNIT-3

7. Vascular smooth muscle: Mechanism of contraction, Pharmaco-mechanical coupling, automaticity
8. Control of blood vessels: Local control mechanisms, Nervous control, Hormonal control

UNIT-4

9. Specialization in individual circulation: Coronary circulation, cerebral circulation,

pulmonary circulation, Cutaneous circulation

10. Cardiovascular receptors, reflexes and central control

11. Coordinated cardiovascular responses: Posture, Valsalva maneuver, Exercise, Diving reflex

12. Cardiovascular responses in pathological situations: Shock and hemorrhage, Syncope, Essential hypertension, chronic cardiac failure

13. Respiratory physiology: Mechanics of respiration, Principles of gas exchange regulation of respire

14. Hematology and coagulation physiology blood components: Blood groups and blood transfusion, Hemostasis

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand the Anatomy and Physiology of the cardiovascular system, including the structure and function of the heart, major blood vessels, and associated organs.

CO 2. Able to assess cardiac output using Fick's principle, thermo dilution, indicator dilution methods, pulse Doppler methods, and other miscellaneous methods.

CO 3. Students have a comprehensive understanding of anatomy, physiology, and pathophysiology of the cardiovascular and respiratory systems.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3

Course Code	Course Name	Type of Course	Credits
BVCCT-202	Applied biochemistry in cardiac care	Skill	4

UNIT-1

Biomolecules and the cell: Major complex biomolecules of cell and cell organelles-Prokaryotic and eukaryotic cell

Carbohydrates: Chemical structure, function and Classification: Monosaccharides, Disaccharides, Polysaccharides, Homopolysaccharides, Heteropolysaccharides, Glycoproteins

Proteins: Amino acids, Classification, Structure of proteins, Determination of protein, structure, Properties of proteins, Denaturation, Classification of proteins, AntiGeneral AntibodyTypes

UNIT-2

Plasma proteins, Blood clotting.

Lipids: Chemical structure, functions and Classification, fatty acids, Triacylglycerols, Phospholipids, glycoproteins, Lipoproteins, Steroids, Amphipathic lipids.

Nucleic acids: Purines and pyrimidine, Structure of DNA, Watson & Crick model of DNA, Structure of RNA, Types of RNA, Enzymes: Definition, Nomenclature, Classification, Factors affecting enzyme activity,

Active site, Coenzyme, Enzyme Inhibition, Mechanism of enzyme action, Units of enzyme,

UNIT-3

Isoenzymes, Enzyme pattern in diseases.

Vitamins & Minerals: Fat soluble vitamins(A,D,E,K), Water soluble vitamins, B-complex vitamins, principal elements(Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chlorine and sulphur), Trace elements, Calorific value of foods, Basal metabolic rate(BMR),

UNIT-4

respiratory quotient(RQ), Specific dynamic action(SDA), Balanced diet, Marasmus,Kwasoikar

Hormones: Classification, Mechanism of action, Hypothalamic hormones, Pituitary– Anterior, posterior; Thyroid – Adrenal cortex, Adrenal medulla; Gonadal hormones, Menstrual cycle, GI hormones

Acids and bases: Definition, pH, Henderson Hasselbach

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand the Biochemical Basis of Cardiac Function.

CO 2. Able to equip students with the knowledge, skills, and competencies necessary to understand and apply concepts related to nutrition, hormones, and acid-base balance in health and disease.

CO 3. To understand the structure, function, and regulation of biomolecules such as plasma proteins, lipids, nucleic acids, and enzymes.

CO 4. To evaluate the role of enzymes in biological processes, including metabolism

CO 5. Able to equip students with the knowledge, skills, and competencies necessary to apply biochemical principles effectively in the assessment.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	3	3	3	2	2	3
CO 5	3	3	3	3	2	3	2	3	3

Course Code	Course Name	Type of Course	Credits
BVCCT-203	Pharmacology related to cardiac technology	Skill	4

UNIT-1

Anti-anginal generals: Beta blockers- propranolol, atenolol, metoprolol, bisoprolol carvedilol, esmolol; Nitrates-nitroglycerine, isosorbide dinitrate, isosorbide mononitrate, transdermal nitrate patches; Calcium channel blockers- nifedipine, verapamil, diltiazem, amlodipine

UNIT-2

2. Anti-failure aGeneralts: Diuretics-furosemide, torsamide, thiazide diuretics, metolazone, spironolactone, combination diuretics; Angiotensin cverting enzyme (ACE) inhibitors – captopril Enalapril, ramipril, lisinopril, ACE inhibitors for diabetics and hypertensive renal disease; Digitalis and acute ionotropes – digoxin, doubutamine, dopamine, adrenaline, noradrenaline, isoprenaline

UNIT-3

3. Anti-hypertensive drugs: Diuretics, beta-blockers, ACE inhibitors, calcium antagonists, direct Vasodilators, centrally acting and peripherally acting vasodilators

4. Anti- arrhythmic aGeneralts: Amiodarone, adenosine, verapamil, diltiazem, lidocaine,

mexiletine, Phenytoin, flecainide, bretylium, atropine

5. Antithrombotic aGeneralts: Platelet inhibitors: aspirin, clopidogrel; Anticoagulants: heparin,

low molecular weight heparin, warfarin; Fibrinolytics: streptokinase, urokinase ;

Glycoprotein 2b3a antagonists: abciximab, tirofiban, eptifibatide

UNIT-4

6. Lipid lowering and anti-atherosclerotic drugs: statins, exetimibe, niacin, fenofibrate

Miscellaneous drugs:

Narcotics: morphine, pethidine, fentanyl

Sedatives: diazepam, midazolam

Steroids: hydrocortisone, prednisolone,

Antihistamines: diphenhydramine

Antibiotics: peticillins, cephalosporins, aminoglycosides

Anesthetic aGeneralts: local, Generaleral

Antacids and proton pump inhibitors, Protamine

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To develop a comprehensive understanding of anti-anginal agents including adverse effects.

CO 2. Classification and mechanism of action of anti-arrhythmic agents.

CO 3. To understand the mechanism of action and therapeutic uses of lipid-lowering agents such as statins.

CO 4. Classify various miscellaneous drugs including narcotics, sedatives, steroids, antihistamines, antibiotics, anesthetic agents.

CO 5. Able to provide students with a comprehensive understanding of the pharmacology of cardiovascular and related drugs.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	3	3	3	2	2	3
CO 5	3	3	3	3	2	3	2	3	3

Course Code	Course Name	Type of Course	Credits
BVCCT-204	Medical electronics, biophysics and computer usage relevant to cardiac technology	General	2

Medical Electronics, Biophysics And Computer Usage Relevant To Cardiac Technology

UNIT-1

Introduction to medical physics

Blood pressure recording

Pressure transducers

Defibrillators

UNIT-2

Cathode ray tubes and physiological monitors

Impedence plethysmography

Pulse oximetry

UNIT-3

Medical ultrasound and Doppler

Ionic currents and Electrocardiography

Electrocardiographic processing and display system

Radiation physics

UNIT-4

Techniques of monitoring radiation exposure

Measures to reduce radiation exposure

Computer use in medical care and data entry

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand medical physics, including principles of measurement, instrumentation, and applications in healthcare.

CO 2. To understand the principles and components of cathode ray tubes (CRTs) and physiological monitors used in healthcare settings for displaying vital signs and monitoring patient parameters.

CO 3. To develop strategies and protocols for reducing radiation exposure to patients and healthcare workers, including optimization of imaging techniques and shielding methods

CO 4. To understand and utilize medical physics principles and technologies in healthcare settings.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Type of Course	Credits
BVCCT-205	General Microbiology	General	3

UNIT-1

Introductory microbiology: Introduction to and brief of microbiology, scope and relevance of microbiology, modern developments in microbiology, explain the types and methods of sterilization, use and types of microscopes; bright microscope, field microscopy, dark field microscopy, phase contrast microscopy, electron microscopy.

UNIT-2

Morphology and structure of microorganisms: Morphology and structure of bacteria, fungi, actinomycete and algae etc., microscopic examination of microorganisms, preparation of culture media, spread plates, pour plates, types of selective and differential media, separation of pure cultures, principles and uses of microbiology equipments and instruments.

UNIT-3

Stains used in microbiology: Introduction to stains; importance of stain in microbiology; types of stains in detailed giving example-simple stain differential stain, negative stain, impregnation method; special staining for certain bacteria, bacterial spores, parasites and fungi; principle, procedure, application and result, interpretation of gram staining and ziehl neelsen staining.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To develop a foundational understanding of microbiology, including its scope, relevance in various fields, and recent advancements in the field.

CO 2. To understand the principles and uses of microbiology equipment and instruments.

CO 3. Able to provide students with a solid foundation in introductory microbiology concepts, laboratory techniques, and microscopy, enabling them to understand, visualize, and analyze microorganisms effectively in various scientific and clinical settings.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3

Course Code	Course Name	Type of Course	Credits
BVCCT-206	Basics of Health Market & Economy	General	3

Unit I

Health Care Market An Introduction : Main Problems in the Market for Health Care, Health Care and Economic Basics, Analyzing Health Care Markets. Demand-Side Considerations: Demand for Health and Health Care, Market for Health Insurance

Unit II

Supply-Side Considerations: Managed Care, Health Care Professionals, Hospital Services, Confounding Factors Public Policy in Medical Care: Policies to Enhance Access, Policies to Contain Costs, Medical Care Systems Worldwide,

UNIT-III

Health Sector in India: An Overview Health Outcomes; Health Systems; Health Financing Evaluation of Health Programs Costing, Cost Effectiveness and Cost-Benefit Analysis; Burden of Diseases ,Role of WHO , Health Care Budget: purpose, types & practices in Indian context.

UNIT-IV

Health Economics: Fundamentals of Economics: Scope & coverage of Health Economics, demand for Health Sciences; Health as an investment, population, Health & Economic Development. Tools of Economics-Concepts of need, demand, supply & price in Health Services. Methods & Techniques of Economic Evaluation of Health Programmes: Cost benefit & cost effective methods-output & input analysis.

Market, monopoly, perfect & imperfect competition. Health Financing from various sources – Public , Private, TPA. Economics of Health Programmes for Nutrition, diet & population control, economics of abuse of tobacco & alcohol, environmental influences on health and feeding. Economics of Communicable (STDs & Malaria) & non-communicable (IHD & Cancers) diseases.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To Understand and analysis of Health Care Market Dynamics

CO 2. To understand economic concepts such as need, demand, supply, and price in health services, as well as methods and techniques for economic evaluation of health programs, including cost-benefit and cost-effectiveness analysis.

CO 3. Able to provide students with a comprehensive understanding of health care markets, policies, and economics, enabling them to analyze and evaluate health care systems, policies, and programs effectively, and make informed decisions in health care management and policy development.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3

Course Code	Course Name	Type of Course	Credits
BVCCTP-201	Applied anatomy and physiology related to cardiac technology Lab	Skill	2

Demonstration of:

- Heart Surface anatomy of heart, chambers of the heart, valves of the heart, major blood vessels of heart, pericardium, coronary arteries.
- Histology: Types of tissue
- (a) Epithelia – Squamous, Glandular, Transitional, Cartilage
- (b) Connective tissue – bone, fibrous tissue, muscle
- Cardiac cycle: Mechanical events, Arterial cycle and central venous pressure cycle, Clinical
- aspects of human cardiac cycle
- heart rate
- Pulse Doppler methods Hemodynamics
- Preload, after-load and contractility, Control of stroke volume and cardiac output
- Vascular smooth muscle automaticity
- reflex
- transfusion, Hemostasis

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Able to identify and describe the surface anatomy of the heart, including its chambers, valves, major blood vessels, pericardium, and coronary arteries.

CO 2. To understand the clinical aspects of the human cardiac cycle, including normal and abnormal findings in heart sounds.

CO 3. To understand the principles of blood transfusion, including blood groups, compatibility testing, and the administration of blood products.

CO 4. Understanding of cardiac anatomy, physiology, and hemodynamics, enabling them to apply this knowledge in clinical practice

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Type of Course	Credits
BVCCTP-202	Applied biochemistry in cardiac care Lab	Skill	2

Demonstration of:

- Biomolecules and the cell: Major complex biomolecules of cell and cell organelles- Prokaryotic and eukaryotic cell
- Carbohydrates
- Disaccharides, Polysaccharides, Homopolysaccharides, Heteropolysaccharides, Glycoproteins
- Proteins
- Management of biochemistry lab
- safety in lab

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand the major complex biomolecules found in cells, including proteins, carbohydrates, lipids, and nucleic acids, and their roles in cellular structure and function.

CO 2. Classification about the structure and functions of carbohydrates, including monosaccharides, disaccharides, and polysaccharides.

CO 3. To develop skills in experimental design, data analysis, and interpretation of results in a biochemistry laboratory setting.

CO 4. Able to identify potential hazards in the laboratory environment and implement appropriate safety measures to prevent accidents and injuries.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Type of Course	Credits
BVCCTP-203	Pharmacology related to cardiac technology Lab	Skill	2

Demonstration of:

- drug used in cardiovascular system
- adverse drugs reaction

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand the rationale behind combination therapy and individualized

treatment regimens for cardiovascular diseases based on patient-specific factors and disease severity.

CO 2. To identify adverse drug reactions (ADRs) associated with cardiovascular medications, including common and serious adverse effects.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2

Course Code	Course Name	Type of Course	Credits
BVCCTP-204	Medical electronics, biophysics and computer usage relevant to cardiac technology Lab	Skill	2

Demonstration of:

- Blood pressure recording
- Pressure transducers
- Defibrillators
- Cathode ray tubes and physiological monitors
- Impedance plethysmography
- Pulse oximetry
- Medical ultrasound and Doppler
- Ionic currents and Electrocardiography
- Electrocardiographic processing and display system

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To develop proficiency in the use of electrocardiographic processing and display systems, including ECG machines.

CO 2. To interpret physiological monitoring data displayed on CRT screens and recognize abnormal trends or patterns.

CO 3. To understand pressure transducers and their applications in measuring blood pressure and other physiological parameters.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3

Course Code	Course Name	Type of Course	Credits
BVCCTP-205	General Microbiology Lab	Skill	2

- Use of microscope in examination of unstained bacteria, fungi, algae, parasites and stained cell preparations including simple staining, Gram's staining, acid fast staining, capsule staining, spore staining using
- prokaryotic and eukaryotic cells, hanging drop preparation.
- Preparation of culture media, spread plates, pour plates,
- selective media, differential media.
- Separation of pure cultures and study the effect of selective nutrients on prokaryotes
- Isolation of Soil Bacteria, Soil Fungi, Soil Actinomycetes

- Selective media for Soil microflora and use of growth factors, Study of Rhizosphere interactions, Quantitative measurements of Soil nutrients and Rhizosphere microflora and preparation of starter cultures of Rhizobia, Azotobacter.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To develop proficiency in using light microscopes for the examination of unstained bacteria, fungi, algae, parasites, and stained cell preparations.

CO 2. To develop proficiency in quantitative methods for measuring soil nutrients and assessing the composition of rhizosphere microflora.

CO 3. Classify various staining techniques including simple staining, Gram's staining, acid-fast staining, capsule staining, and spore staining to differentiate between different types of microorganisms.

CO 4. To equip students with practical skills and theoretical knowledge necessary for conducting microbiological studies, particularly in the context of environmental microbiology, soil microbiology, and plant-microbe interactions.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	2	2	3	1	1
CO 2	2	2	2	1	1	2	3	2	3
CO 3	3	2	1	3	2	3	3	2	3
CO 4	3	2	1	2	2	3	2	2	3

BVOC (Cardiac Care Technology) IIIrd Sem

Course Code	Course Name	Type of Course	Credits
BVCCT-301	Pathology related to cardiac care	General	4

UNIT-1

Valvular heart disease: Etiology, Acquired valvular heart disease, Rheumatic fever and rheumatic heart disease, Aortic stenosis, Aortic regurgitation, Mitral valve disease, Mitral stenosis, Mitral regurgitation, Tricuspid valve disease, Infective endocarditis, Valvuloplasty and valve surgery

Coronary artery disease: Pathophysiology and clinical recognition, Angina Pectoris, Symptomatic and asymptomatic myocardial ischemia, Types and locations of myocardial infarction, Thrombolytic therapy, Medical treatment, Percutaneous interventions, Surgical treatment, Cardiac rehabilitation

UNIT-2

Systemic hypertension: Essential and secondary hypertension

Heart failure: Surgical and medical treatment

Myocardial diseases: Dilated cardiomyopathy, Hypertrophic cardiomyopathy, Myocarditis, Restrictive cardiomyopathy.

Pericardial Diseases: Pericardial effusion, Constrictive pericarditis, Cardiac tamponade

UNIT-3

Electrical disturbances of the heart: Sinus node dysfunction, Arrhythmias and conduction disturbances, Treatment of arrhythmias, pharmacological, radiofrequency ablation and surgery

Pulmonary hypertension: Primary pulmonary hypertension, Pulmonary thrombo-embolism

Peripheral Vascular Disease: Atherosclerotic peripheral vascular disease, Aortic

aneurysms, Aortic dissection, Takayasu arteritis

UNIT-4

ConGeneralital heart disease: (a) Acyanotic heart disease, Atrial septal defect, Ventricularseptal defect, Patent ductus arteriosus, ConGeneralital valvular disease, Coarctation of aorta

(b) Cyanotic Congenital heart disease, Tetralogy of Fallot , Double outlet right ventricle Pulmonary atresia, Transposition of great arteries, Truncus arteriosus, Total anomalous pulmonary venous connection.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand the principles and techniques of valvuloplasty and valve surgery for the management of valvular heart diseases.

CO 2. To understand the pathophysiology and clinical recognition of coronary artery disease, including angina pectoris, myocardial ischemia, and myocardial infarction.

CO 3. Classify sinus node dysfunction, arrhythmias, and conduction disturbances, including their pathophysiology, clinical manifestations, and treatment options such as pharmacological therapy, radiofrequency ablation, and surgery.

CO 4. To understand of various cardiovascular diseases, their pathophysiology, clinical manifestations, diagnostic approaches, and management strategies.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	2	2	3	1	1
CO 2	2	2	2	1	1	2	3	2	3
CO 3	3	2	1	3	2	3	3	2	3
CO 4	3	2	1	2	2	3	2	2	3

Course Code	Course Name	Type of Course	Credits
BVCCT-302	Microbiology related to cardiac care	General	3

UNIT-1

Microbiology

1. Introduction to Microbiology & classification.

UNIT-2

Morphology & Physiology of Bacteria

Staphylococcus

Streptococcus Mycobacterium tuberculosis Spirochetes

CornybacteriumDiphtheria.

UNIT-3

Gram Positive Bacteria

Gram Negative Bacteria

Fungi -sephorophytics and pathoGeneralic

Virus

Aseptic techniques

Chlamyadia& parasites.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Classification of microorganisms based on various criteria such as morphology, physiology, and genetic characteristics.

CO 2. To understand the physiological characteristics and metabolic pathways of these bacteria, including their growth requirements, biochemical reactions, and mechanisms of pathogenesis.

CO 3. Classify and understand the structure, replication cycle, and pathogenic mechanisms of viruses, including DNA and RNA viruses.

CO 4. To develop proficiency in aseptic techniques used in microbiological laboratories to prevent contamination and maintain sterile conditions during the handling and manipulation of microorganisms.

CO 5. To understand the microbiology, including the morphology, physiology, classification, and clinical significance of different microorganisms, as well as the principles and practices of aseptic techniques used in microbiological laboratories.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3
CO 5	3	3	3	2	3	3	2	3	2

Course Code	Course Name	Type of Course	Credits
BVCCT-303	Advanced electrocardiography	Skill	4

UNIT-1

The abnormal electrocardiogram, Left atrial abnormality, Right atrial abnormality, Left ventricular hypertrophy and enlargement, Right ventricular hypertrophy and enlargement, Intraventricular conduction delays, Left anterior fascicular block, Left posterior fascicular block, Left bundle branch block, Right bundle branch block, Myocardial ischemia and infarction,

UNIT-2

Repolarization (ST-Twave) abnormalities, QRS changes, Evolution of electrocardiographic changes, Localization of ischemia or infarction, Non- infarction Q waves, Primary and secondary T wave change, Electrolyte and metabolic ECG abnormalities, Cardiac arrhythmias, Ventricular premature

UNIT-3

beats, Supra-ventricular, tachycardias, Atrial flutter/fibrillation, Ventricular Tachycardia/Ventricular fibrillation, Atrio Ventricular block, Prolonged PR interval, Mobitz

UNIT-4

type 1 and 2 block, Complete heart block, Direct Current (DC) shock, Defibrillator, Monophasic and biphasic shock, Technique of cardioversion, Indications for cardioversion.

Course Outcomes:

Upon completion of this course the student will be able to:

- CO 1.** To be able to characterize ECG findings associated with each structural abnormality and their clinical significance.
- CO 2.** To understand the principles of localizing the site of ischemia or infarction based on ECG findings and differentiating between infarction and non-infarction Q waves.
- CO 3.** To develop proficiency in the techniques of cardio version and defibrillation using direct current (DC) shock, monophasic shock, and biphasic shock.
- CO 4.** To interpret electrocardiographic abnormalities associated with structural heart diseases, ischemia, infarction, electrolyte imbalances, metabolic disturbances, and cardiac arrhythmias.
- CO 5.** To develop proficiency in the techniques of cardio version and defibrillation for the management of life-threatening cardiac arrhythmias.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3
CO 5	3	3	3	2	3	3	2	3	2

Course Code	Course Name	Type of Course	Credits
BVCCT-304	Echocardiography	Skill	3

UNIT-1

M- Mode and 2D transthoracic echocardiography, Views used in transthoracic echocardiography, Doppler echocardiography: pulsed, continuous wave and colour, Measurement of cardiac dimensions, Evaluation of systolic and diastolic left ventricular

UNIT-2

function, Regional wall motion abnormalities, Stroke volume and cardiac output assessment, Transvalvular gradients, Orifice area, Continuity equation, Echocardiography in Valvular heart disease: Mitral stenosis, Mitral regurgitation, Mitral valve

UNIT-3

prolapsed, Aortic stenosis, Aortic regurgitation, Infective endocarditis Prosthetic valve assessment, Echocardiography in Cardiomyopathies: Dilated, Hypertrophic, Restrictive, Constrictive

UNIT-4

pericarditis, pericardial effusion and cardiac tamponade, Echocardiographic detection of conGeneralital heart disease: Atrial septal defect, Ventricular septal defect, Patent ductus arteriosus, Pulmonary stenosis, Tetralogy of Fallot, Coarctation of aorta, left atrial thrombus, Left aortal myxoma, Transoesophageal echocardiography

Course Outcomes:

Upon completion of this course the student will be able to:

- CO 1.** To understand the echocardiographic assessment of prosthetic valves and the evaluation of transvalvular gradients.
- CO 2.** To understand the echocardiographic features and diagnostic criteria for detecting pericardial effusion, cardiac tamponade, and pericarditis.
- CO 3.** To develop proficiency in utilizing different echocardiographic techniques and views to assess cardiac anatomy, function, and pathology accurately.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCT-305	Advance Computing skills	General	2

Unit-1

Advance Word Processing Tools, Setting the layout of Table and documents, Mail merge techniques. Letter envelopes etc, Using spell check and Thesaurus, Foot note and Endnotes, Using Charts , shapes and pictures in word .

Unit-2

Basics of Spreadsheet, Functions of Spreadsheet , Applications , Elements of Electronic Spread sheet ,creating document saving and printing the worksheet, manipulation of cells ,Functions and charts, using formulas , Functions and charts

UNIT-3

Advance Spreadsheet Tools, Manipulations with charts and its types, Sorting, Filtering of data ,Pivot table, data validation techniques. Grouping and subtotaling of data. Text to column option . Printing of customized worksheet.

UNIT-4

Presentation Software, Using Powerpoint, Opening an powerpoint presentation, Saving a presentation , Entering and editing text, inserting and deleting slides in a presentations , preparation of slides , adding clip arts, charts etc., Providing Aesthetics , Enhancing text presentation ,working with color lines styles and movie and sound ,adding header and footer, presentation.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To develop proficiency in Advanced Word Processing Features

CO 2. To develop proficiency in Advanced Spreadsheet Techniques

CO 3. To develop proficiency in Presentation Software.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCT-306	Human Values & Professional Ethics	General	4

UNIT-1

Need, Basic Guidelines, Content and Process for Value Education

Understanding the need, basic guidelines, content and process for Value Education

Self-Exploration its content and process, Natural Acceptance’ and Experiential Validation- as the mechanism for self-exploration

Continuous Happiness and Prosperity- A look at basic Human Aspirations

Right understanding, Relationship and Physical Facilities- the basic requirements for fulfilment of

aspirations of every human being with their correct priority

Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario

Method to fulfil the above human aspirations: understanding and living in harmony at various levels

UNIT 2:

Understanding Harmony in the Human Being Understanding human being

Understanding the Body as an instrument

Understanding the harmony of Body, correct appraisal of Physical needs, meaning of Prosperity in detail

UNIT 3:

Understanding Harmony in the Family and Society-

Harmony in Human Relationship

Understanding Harmony in the family – the basic unit of human interaction

Understanding values in human-human relationship

Trust and Respect as the foundational values of relationship

Understanding the meaning of trust

Difference between intention and competence. Understanding the meaning of respect

Understanding the harmony in the society (society being an extension of family)

UNIT-4

Natural acceptance of human values

Definitiveness of Ethical Human Conduct

Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order

Competence in professional ethics:

a) Ability to utilize the professional competence for augmenting universal human order

b) Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,

c) Ability to identify and develop appropriate technologies and management patterns for above production systems.

Case studies of typical holistic technologies, management models and production systems

Strategy for transition from the present state to Universal Human Order:

a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers

b) At the level of society: as mutually enriching institutions and organizations

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To develop competence in professional ethics, including utilizing professional skills to promote universal human order and identifying people-friendly and eco-friendly production systems.

CO 2. To understand the human body as an instrument and its role in achieving harmony.

CO 3. To understand the concept of self-exploration and the role of "natural acceptance" and experiential validation in this process.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCTP-301	Pathology related to cardiac care Lab	Skill	2

- Valvular heart disease ,rheumatic heart disease stenosis,
- Mitral regulation,
- Tricuspid Medical treatment,
- Percutaneous interventions,
- Surgical treatment,
- Cardiac rehabilitation pulmonary venous connection.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand the principles of surgical correction for TAPVC and the long-term outcomes associated with this condition.

CO 2. To understand the diagnostic criteria and imaging modalities used in evaluating valvular heart disease.

CO 3. To understand the surgical options for valvular heart diseases, including valve repair and replacement surgeries.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCTP-302	Microbiology related to cardiac care Lab	Skill	2

Demonstration of:

- Staphylococcus
 - Streptococcus Mycobacterium tuberculosis Spirochetes
 - CornybacteriumDiphtheria.
 - Gram Positive Bacteria staining
 - Gram Negative Bacteria staining

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand the significance of bacterial species in causing various infectious diseases and their impact on human health.

CO 2. To demonstrate proficiency in laboratory techniques for culturing, isolating, and identifying bacterial species, including specimen collection, inoculation, and incubation.

CO 3. To analyse and characterize various bacterial species, as well as proficiency in Gram

staining techniques used in clinical microbiology laboratories.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCTP-303	Advanced electrocardiography Lab	Skill	2

Demonstration of:

- Abnormal electrocardiogram
- Localization of ischemia or infarction,
- Technique of cardioversion, Indications for cardioversion.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To differentiate between benign variants and pathological findings on the ECG and understand the implications for patient management.

CO 2. To understand the principles and indications for cardioversion in the management of cardiac arrhythmias.

CO 3. To interpret abnormal ECG findings, localizing myocardial ischemia or infarction.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCTP-304	Echocardiography Lab	Skill	2

Demonstration of:

- Echocardiography,
- Doppler echocardiography
- Echocardiography in Valvular heart

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand the indications, advantages, and limitations of echocardiography in the assessment of cardiac structure and function.

CO 2. To understand the principles of Doppler echocardiography, including spectral Doppler, color Doppler, and tissue Doppler imaging.

CO 3. To interpret echocardiography and Doppler echocardiography, with a focus on their applications in the evaluation and management of valvular heart disease.

BVOC (Cardiac Care Technology) IVth Sem

Course Code	Course Name	Type of Course	Credits
BVCCT-401	Treadmill exercise stress testing and 24 HR Ambulatory ECG Reporting	General	4

UNIT-1

Exercise physiology, protocols, Lead systems, Patient preparation
ST segment displacement – types and measurement, Non electrocardiographic observations

UNIT-2

Exercise test indications, contra-indications and precautions Cardiac arrhythmias and conduction disturbances during stress testing, Emer Generalise

UNIT-3

stress testing laboratory. Principles of Holter Recording, Connections of the Holter recorder, Holter Analysis Guidelines for ambulatory electrocardiography

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Interpreting electrocardiographic (ECG) observations during exercise, including ST segment displacement.

CO 2. Identifying and interpreting cardiac arrhythmias and conduction disturbances during exercise.

CO 3. Interpreting ECG findings and correlating them with clinical symptoms and history.

CO 4. Recognise indications for Holter monitoring and its role in diagnosing cardiac arrhythmias and other abnormalities.

CO 5. Knowledge and skills in exercise testing, electrocardiography, and ambulatory monitoring, enabling them to perform and interpret tests effectively in clinical settings.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCT-402	Community Healthcare	Skill	4

UNIT-1

Definition of Health, Determinants of Health, Health Indicators of India, Health Team Concept. a. National Health Policy b. National Health Programmers (Briefly Objectives and Scope) c. Population of India and Family welfare programme in India.

UNIT-2

Family: a. The family, meaning and definitions b. Functions of types of family c. Changing family patterns d. Influence of family on Individuals Health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their Importance to physiotherapy.

UNIT-3

Community: a. Rural community: Meaning and features – Health hazards to rural communities, health hazards to tribal community. b. Urban community – Meaning and features – Health hazards of urbanities

UNIT-4

Culture and Health Disorders a. Social Change: b. Meaning of social changes c. Factors of social changes d. Human adaptation and social changes e. Social changes and stress f. Social changes and deviance g. Social changes and health programme h. The role of social planning

in the Improvement of health and rehabilitation 5. Social Problems of disabled: a. Consequences of the following social problems in relation to sickness and disability b. Population explosion

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Identification and comprehension of various determinants influencing health including biological, social, environmental, and behavioural factors.

CO 2. Understanding of key components of national health policies and programs in India, including objectives, scope, and implementation strategies.

CO 3. Identification of health hazards specific to rural and tribal communities, including environmental, socio-economic, and cultural factors.

CO 4. Recognition of the relationship between social changes, stress, deviance, and health disorders.

CO 5. Understanding of the interplay between various social, cultural, and environmental factors in shaping health outcomes at the individual, family, and community levels.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCT-403	General Medicine and Surgery	Skill	4

UNIT-1

MEDICINE

Pericarditis

Valvular diseases

Rheumatic Heart Disease

Heart failure

Chronic Bronchitis

UNIT-2

Emphysema

Brochitis

Pneumonia

Tuberculosis

Pleura effusion

Empyema Spontaneous Phenumo thorax

UNIT-3

Surgery

Cholelithiasis

Peritonitis

Suprahrenic Abscess

UNIT-4

Appendicitis

Benign Hypertrophy prostate

Sinusitis

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the etiology, and pathophysiology of pericarditis.

CO 2. Understand the diagnostic modalities and treatment options, including antibiotics, nasal decongestants, and sinus surgery when indicated.

CO 3. Understand various medical and surgical conditions, including their etiology,

pathophysiology, clinical manifestations, diagnostic modalities, and treatment options.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCT-404	Medical Terminology & Record keeping	General	3

UNIT-1

Derivation of medical terms.

Define word roots, prefixes, and suffixes.

Conventions for combined morphemes and the formation of plurals.

Basic medical terms.

UNIT-2

Form medical terms utilizing roots, suffixes, prefixes, and combining roots.

Interpret basic medical abbreviations/symbols.

UNIT-3

Utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system, musculoskeletal system, respiratory system, cardiovascular system,

UNIT-4

nervous system, and endocrine system.

Interpret medical orders/reports.

Data entry and management on electronic health record system.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the significance of each component in defining the meaning of medical terms.

CO 2. Knowledge of standard abbreviations and their meanings in medical contexts.

CO 3. Understand the terminology used in medical documentation and its implications for patient care.

CO 4. Able to enter and manage patient data in electronic health record (EHR) systems.

CO 5. Able to analyse and construct medical terms, interpret abbreviations and symbols, and effectively communicate within healthcare settings.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCT-405	Health and fitness	General	3

Unit 1:

Personal Health, Nutrition, and Fitness

Your Lifestyle and Your Health

Your Role in Maintaining Your Health

Guidelines for a Healthy Diet

Dietary Guidelines and Nutritional Facts

Nutrition and Chronic Diseases

Individual Caloric and Nutritional Needs

Benefits of Physical Activity

Unit 2

Preventing Disease and Injury

Immunity and Preventing Disease

Lifesaving and Emergency Care Procedures

Strategies for Preventing Accidents

Unit 3

Growth, Development, and Sexuality

Human Reproduction and Development

Benefits of Healthy Sexual Practices

Peer Pressure and Sexual Activity

Family Planning Strategies

Unit 4

Substance Abuse

Health Effects of Using Alcohol, Tobacco, and Other Drugs

Harmful Effects of Dietary Supplements and Anabolic Steroids

Effects of Medicines and Illegal Substances

Peer Pressure Substance Abuse

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the interconnection between lifestyle choices and overall health.

CO 2. Recognize the benefits of regular physical activity for cardiovascular health, muscular strength, and flexibility.

CO 3. Understand the role of nutrition in supporting fitness goals

CO 4. Recognize common exercise-related injuries and risk factors.

CO 5. Adhere to the knowledge, skills, and attitudes necessary to promote health and fitness, prevent disease and injury, and support individuals in achieving their wellness goals.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCT-406	Advance communication and soft skill	General	2

UNIT-1

Functional Grammar-II

a) Application writing

b) Paragraph writing, essay writing and précis writing

c) Pre-testing of oral and writing skills

UNIT-2

Professional Skills

a) Biodata, CV and resume writing

b) Joining letter, cover letter and resignation letter

c) Inter- office memo, formal Business letter, informal notes

d) Minutes of the meeting, reporting events, summary writing

UNIT-3

Presentation skills

a) Power-point presentations and presenting techniques

b) Body language

c) Describing people, places and events

d) Extempore, speech and just- a minute sessions

Course Code	Course Name	Type of Course	Credits
BVCCTP-402	Community Healthcare Lab	Skill	2

Demonstration of :-

- Visit to different NGO's
- National Health Policy
- National Health Programmers (Briefly Objectives and Scope)
- Population of India and Family welfare programme in India.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Attain first hand exposure to the operations and activities of non-governmental organizations (NGOs) working in the field of healthcare and social services.

CO 2. Able to analyze the impact of national health policies on public health outcomes and healthcare delivery systems.

CO 3. Knowledge of key national health programs implemented by the Government of India

CO 4. Understand India's demographic profile, including population size, growth rate, age distribution, and regional variations.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3

Course Code	Course Name	Type of Course	Credits
BVCCTP-403	General Medicine and Surgery Lab	Skill	2

Demonstration of :-

- Heart disease with indication and contraindication by ppt and presentations

Course Outcomes:

Upon completion of this course the student will be able to:

Summarize the knowledge, skills, and competencies necessary to effectively demonstrate heart disease indications and contraindications through PowerPoint presentations, ensuring evidence-based practice, patient-centered care, and ethical conduct in clinical practice.

Course Code	Course Name	Type of Course	Credits
BVCCTP-404	Medical Terminology & Record keeping Lab	Skill	2

Demonstration of:

- medical terms.
- Interpret basic medical abbreviations/symbols
- Utilize diagnostic, surgical, and procedural terms and abbreviations

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the significance of each component in defining the meaning of medical terms.

CO 2. Knowledge of standard abbreviations and their meanings in medical contexts.

CO 3. Understand the terminology used in medical documentation and its implications for

patient care.

CO 4. Able to enter and manage patient data in electronic health record (EHR) systems.

CO 5. Able to analyse and construct medical terms, interpret abbreviations and symbols, and effectively communicate within healthcare settings.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCTP-405	Health and fitness Lab	Skill	2

DEMONSTRATION OF:

Personal Health

Dietary Guidelines

Substance Abuse

Health Effects of Using Alcohol, Tobacco, and Other Drugs

Effects of Medicines and Illegal Substances

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the interconnection between lifestyle choices and overall health.

CO 2. Recognize the benefits of regular physical activity for cardiovascular health, muscular strength, and flexibility.

CO 3. Understand the role of nutrition in supporting fitness goals

CO 4. Recognize common exercise-related injuries and risk factors.

CO 5. Adhere to the knowledge, skills, and attitudes necessary to promote health and fitness, prevent disease and injury, and support individuals in achieving their wellness goals.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

BVOC (Cardiac Care Technology)

Vth Sem

Course Code	Course Name	Type of Course	Credits
BVCCT-501	Cardiac Catheterization Laboratory Basics	Skill	4

UNIT-1

Type of catheters

Catheter cleaning and packing
 Techniques of sterilization-advantages and disadvantages of each
 Setting up the cardiac catheterization laboratory for a diagnostic study
 Table movement
 Image intensifier movement
 Image play back

UNIT-2

Intra cardiac pressures
 Pressure recording systems
 Fluid filled catheters versus catheter tipped manometers Artifacts, damping, ventricularization
 Pressure gradient recording – pullback, peak – to peak
 Cardiac output determination

UNIT-3

Thermo dilution method
 OxyGeneral dilution method
 Principles of oximetry
 Shunt detection and calculations.
 Coronary angiography

UNIT-4

Coronary angiographic catheters
 Use of the manifold
 Angiographic views in coronary angiography
 Laboratory preparation for coronary angiography
 Left Ventriculography – catheters, views, use of the injector

Course Outcomes:

Upon completion of this course the student will be able to:

- CO 1.** Understand the different types of catheters used in cardiac catheterization procedures, including angiographic catheters, guiding catheters, and diagnostic catheters.
CO 2. Evaluate advantages and disadvantages of various sterilization methods
CO 3. Interpret intracardiac pressure waveforms and understand the physiological significance of pressure measurements in different cardiac chambers.
CO 4. Understand principles of oximetry and interpretation of oxygen saturation measurements
CO 5. Knowledge and practical skills in cardiac catheterization techniques, equipment operation, hemodynamic monitoring, and interpretation of angiographic images for diagnostic and interventional cardiology procedures.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCT-502	Quality Control & patient Safety	Skill	3

UNIT-1

Concepts of Quality of Care
 Quality Improvement Approaches
 Standards and Norms
 Quality Improvement Tools

UNIT-2

Vital signs and primary assessment

Basic Emergency care – first aid and triage Ventilations including use of bag-valve-masks (BVMs)

d. Choking, rescue breathing methods

UNIT-3

One- and Two-rescuer CPR

Using an AED (Automated external defibrillator).

Managing an Emergency including moving a patient

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Recognize the importance of quality improvement in healthcare settings to enhance patient outcomes and satisfaction.

CO 2. Understand the role of standards, guidelines, and norms in healthcare quality assurance and accreditation processes.

CO 3. Demonstrate proficiency in providing artificial ventilations using bag-valve-mask (BVM) devices to support patients with inadequate or absent breathing.

CO 4. Understand the steps and sequence for performing high-quality chest compressions, rescue breaths, and automated external defibrillator (AED) use in one-rescuer and two-rescuer CPR scenarios.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3

Course Code	Course Name	Type of Course	Credits
BVCCT-503	Bio- Statics	General	3

UNIT-1

Introduction about Biostatistics, variables, data, population sample, parameter statistics, scales of measurement.

Classification & Presentation of data: Frequency distribution, Frequency polygon, Bar diagram, Histogram, Frequency distribution curve, CF & CP, Ogive, Percentile & Quartiles.

Descriptive statistics: Statistics of location, Mean Median Mode, Geometric mean, Range, Statistics of Dispersion, Mean Deviation, Standard Deviation, Coefficient of Variation. Correlation & Regression.

UNIT-2

Sampling Statistics: Sampling & Sampling Distribution, Sampling Errors & sampling statistics, Standard errors, Degree of freedom, Types of Sampling.

Probability Distribution: Classical definition, Conditional probability, Probability in continuous, joint distribution of random variables.

UNIT-3

Experimental Design: Controlled and uncontrolled experiment, Sampling types, Sample size & pilot experiment, Single factor experiment & Factorial experiment-example, Analysis of variance (ANOVA).

UNIT-4

Applications: Collection, presentation and analysis of hospital statistical data with examples. Collection, presentation and analysis of Optometric and ophthalmologic data with a few examples

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the fundamental concepts and principles of biostatistics, including its application in healthcare research and practice.

CO 2. Explain the principles of sampling and sampling distribution in the context of inferential statistics.

CO 3. Apply statistical methods to collect, organize, and analyze hospital data, such as patient demographics, diagnoses, and outcomes.

CO 4. Explain the concept of analysis of variance (ANOVA) and its application in comparing means across multiple groups.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3

Course Code	Course Name	Type of Course	Credits
BVCCT-504	Medical Ethics & Patient Care	General	4

UNIT 1

Medical ethics - Definition - Goal - Scope

Introduction to Code of conduct

UNIT 2

Basic principles of medical ethics –Confidentiality

Malpractice and negligence - Rational and irrational drug therapy

UNIT 3

Autonomy and informed consent - Right of patients

Care of the terminally ill- Euthanasia

UNIT 4

Organ transplantation, Medico legal aspects of medical records –Medico legal case and type-Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information - Unauthorized disclosure - retention of medical records - other various aspects, Professional Indemnity insurance policy, Development of standardized protocol to avoid near miss or sentinel events, Obtaining an informed consent

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Define medical ethics and understand its goals, scope, and relevance in healthcare practice.

CO 2. Understand concepts of malpractice and negligence in healthcare delivery and strategies for risk mitigation.

CO 3. Discuss the principles of patient autonomy and informed consent, including ethical considerations in treatment decision-making.

CO 4. Explain the principles of confidentiality and its importance in maintaining patient privacy and trust.

CO 5. Explore strategies for mitigating medico-legal risks and ensuring ethical conduct in healthcare practice.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
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		Course	
BVCCT-505	Digital literacy and account literacy	Skill	3

Unit 1:

Review of MS office
 Advance options in MS excel
 Excel
 Power point
 Introduction to internet learning platform
 Using internet-based learning platform
 Using google and you tube for learning
 Using smart phone to become smart

UNIT-2

Benefits of digital learning
 Using internet for personal requirement
 Online payments method
 Use of social media for advisement
 Digital security and privacy
 Various cybercrime and their safety guideline
 Best practice for securing online and network transaction
 Managing privacy and security and social media accounts

UNIT-3

Introduction and basic of financial planning
 Concept of time and value of money
 Risk and return
 Myths about easy money
 Financial planning with examples
 Introduction to financial market and institution investment option in post office
 Sources of finance
 Capital market basics
 Basic of money market
 Mutual funds

UNIT-4

Life insurance
 General insurance
 Types of banks
 KYC
 Function of commercial banks and RBI and its function
 Deposit accounts-understanding of operation
 Retail finance
 Personal loan
 Corporate banking
 Cheque collecting services
 Payments modes in banking system

Course Outcomes:

Upon completion of this course the student will be able to:

- CO 1.** Discover the educational resources available on Google and YouTube for self-directed learning and professional development.
- CO 2.** Understand the importance of digital security and privacy in safeguarding personal information and sensitive data online.
- CO 3.** Understand the concept of time value of money and its implications for financial decision-making, including future value, present value, and compound interest.
- CO 4.** Understand the Know Your Customer (KYC) process and its importance in verifying customer identity and preventing financial fraud and money laundering.
- CO 5.** Learn how insurance products provide financial protection against risks such as death, disability, accidents, and property damage.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3

Course Code	Course Name	Type of Course	Credits
BVCCTP-501	Cardiac Catheterization Laboratory Basics Lab	Skill	2

DEMONSTRATION OF:

- Use of catheters
- Catheter cleaning and packing
- Techniques of sterilization
- Table movement
- Image intensifier movement
- Shunt detection and calculations.
- Use of the manifold

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Identify different types of catheters used in medical procedures.

CO 2. Demonstrate proper techniques for cleaning, disinfecting, and packing catheters to maintain sterility and prevent contamination.

CO 3. Understand the advantages and disadvantages of each sterilization method and adhere to recommended guidelines for safe and effective sterilization practices.

CO 4. Understand how to adjust table movement and image intensifier positioning to optimize visualization of anatomical structures and catheter placement.

CO 5. Understand the function and operation of pressure manifolds in invasive procedures requiring multiple pressure measurements.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCTP-502	Quality Control & patient Safety Lab	Skill	2

- Quality of Care
- Vital signs and primary assessment
- Basic emergency care

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand how to apply quality improvement tools and techniques to identify and analyse in care delivery processes.

CO 2. Recognize the significance of vital signs in assessing and monitoring a patient's physiological status and overall health.

CO 3. Understand the fundamental first aid skills for providing immediate care to individuals experiencing medical emergencies, injuries, or sudden illnesses.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCTP-503	Bio- Statics Lab	Skill	2

- Calculation of data, population sample, parameter statistics, scales of measurement.
- Classification & Presentation of data.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Calculate various statistical measures such as mean, median, mode, variance, and standard deviation for a given dataset.

CO 2. Understand the importance of frequency distributions in summarizing and visualizing data.

CO 3. Calculate, analyse and interpreting statistical data, as well as presenting findings in a clear and concise manner using appropriate graphical and tabular methods.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCTP-504	Medical Ethics & Patient Care Lab	Skill	2

- law and liability and duties of staff
- Workplace issues
- Bioethical issue
- Care and handling of patient
- Medico legal cases
- emergency care and life support skills
- CPR
- Vital signs and primary assessment
- bag-valve-masks

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the legal duties and responsibilities of healthcare staff in providing care to patients, ensuring patient safety, and maintaining confidentiality.

CO 2. Understand the importance of workplace safety and health regulations, including infection control measures, hazardous materials management, and ergonomic principles.

CO 3. Understand how to document patient care accurately, comprehensively, and ethically to meet legal and regulatory requirements.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCTP-505	Digital Literacy and account literacy Lab	Skill	2

- Uses Advance options in MS excel
- Excel
- Power point
- Using internet-based learning platform

- Using google and you tube for learning
- Using smart phone to become smart
- Using internet for personal requirement
- Online payments method
- Use of social media for advisement

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Develop knowledge, skills, and competencies necessary to leverage advanced features in MS Excel and PowerPoint.

CO 2. Develop to navigate internet-based learning platforms effectively

CO 3. Develop to utilize Google and YouTube for learning purposes.

CO 4. Develop to harness the potential of smartphones for learning and productivity.

CO 5. Develop to manage online payments securely, and leverage social media for personal and professional advancement.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

BVOC (Cardiac Care Technology) VIth Sem

Course Code	Course Name	Type of Course	Credits
BVCCT-601	Cardiac Catheterization Laboratory Advance	Gen	6

UNIT-1

Aortic angiography – aortic root, arch, abdominal aorta
Peripheral angiography and carbondioxide angiography
Catheterization and angiography in children with conGeneralital heart disease
Contrast aGeneralts

Ionic and non-ionic

Types of non-ionic aGeneralts

Contrast nephropathy

Measures to reduce incidence of contrast neophropathy

Coronary angioplasty (PTCA)

Equipment and harware used in PTCA:

Guiding catheters

UNIT-2

Guidewires

Balloons

Stents

Setting up the laboratory for a PTCA case

CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVCCTP-601	Cardiac Catheterization Laboratory Advance Lab	Skill	4

Demonstration of:

- Aortic angiography
- carbon dioxide angiography Catheterization and angiography in children with congenital
- use of Contrast agents
- Measures to reduce incidence of contrast nephropathy
- Coronary angioplasty (PTCA)
- Equipment and hardware used in PTCA

Use of:

- Guide wires
- Balloons
- Stents
- Setting up the laboratory for a PTCA case
- Balloon Mitral valvuloplasty (BMV)

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Develop knowledge, skills, and competencies necessary to perform aortic and cardiac angiography.

CO 2. Understand the unique anatomical and physiological considerations in pediatric cardiac catheterization procedures.

CO 3. Understand the procedural steps, equipment setup, and safety precautions involved in PTCA procedures.

CO 4. Understand the requirements and protocols for setting up the cardiac catheterization laboratory for performing BMV procedures.

CO 5. Adhere to established standards of practice and safety guidelines in interventional cardiology.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Bachelor of Vocational Studies Program Outcomes (POs) for B.Voc

PO1	Disciplinary Knowledge: Demonstrate comprehensive knowledge of one or more disciplines that form a part of an undergraduate B.Voc programme Execute strong theoretical and practical understanding generated from the chosen B.Voc programme.
PO2	Critical Thinking and Problem solving: Exhibit the skill of critical design thinking and use them to predict a range of creative solutions towards a design problem, evaluate them and choose the most appropriate options.
PO3	Social Competence Exhibit thoughts and ideas effectively in writing and orally; communicate with others using appropriate media, build effective interactive and presenting skills to meet global competencies and connect to people individually or in group settings.
PO4	Research-Related Skills: Demonstrate a sense of inquiry and capability for asking relevant/appropriate questions; ability to plan, execute and report the results of an experiment Employ knowledge of the avenues for research and higher academic achievements in the chosen field and allied subjects and aware about research ethics, intellectual property rights and issues of plagiarism.
PO5	Personal and Professional competence: Perform independently and participates in team activities and demonstrates cooperation. Integrate enthusiasm and commitment to improve personal and team performance levels and build skills to achieve the goals.
PO6	Effective Citizenship and Ethics : Demonstrate empathetic social concern and equity centred national development; ability to act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.
PO7	Environment and Sustainability: Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.
PO8	Self-directed and Life-long learning: Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.
PO9	Trans-disciplinary Research competence: Create new conceptual, theoretical, methodological innovations that integrate and transcend beyond discipline-specific approaches to address a common problem.

BVOC (Dialysis Technology) 1st Sem

Course Code	Course Name	Content Type	Credit
BVDT-101	Human Anatomy and Physiology -1	General	4

Unit -1

anatomical Position



Facing the observer, head level, eyes facing forward.



This is what the image in the book looks like



Prone: facing face down, Supine: facing face up



Superior: upper part of the body



Inferior: lower part of the body



Anterior: near to or at the front



Posterior: near to or the back of the body



Medial: midline (think of the body being divided into 2)



Lateral: far from midline (away from the center)



Intermediate: between 2 structures



Lpsilateral: same side of the body as another structure



Contralateral: on the opposite side of another structure



Proximal: close to where the structure originates. Near to the attachment of a limb



Distal: away from the attachment of a limb to the trunk



Superficial: toward or on the surface of the body



Deep (internal): away from surface of the body

Terminology and General Plan of the Body, Body Parts and Areas, Terms of Location and Position, Body Cavities and Their Membranes, Dorsal cavity, Ventral cavity, Planes and Sections, Cells: Structure, function and location, Prokaryotic and eukaryotic cells, Cell organelles, Cell division.

UNIT-2

Tissue, Types, Structure, Location and Function of Epithelial Tissue, Connective Tissue, Muscle Tissue, Nerve Tissue, Membranes, Glandular tissue The Integumentary System: structure and function of The Skin, Subcutaneous Tissue, Musculoskeletal System: Basic anatomy of important muscles and bones.

UNIT-3

Cell physiology: Structure, membrane, transport across cell membrane, Active, Passive, Organization of the Body, Body Composition, Body Fluid Volumes and its measurement, Diffusion, Osmosis, Tonicity, Homeostasis

UNIT-4

Blood-composition, function, cellular component & their function, haemoglobin & anaemia, blood groups and coagulation

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Explain the gross morphology, structure and functions of various organs of the human body.

CO 2. Describe the various homeostatic mechanisms and their imbalances.

CO 3. Identify the various tissues and organs of different systems of human body.

CO 4. Demonstrate the various experiments related to special senses and nervous system.

Course Code	Course Name	Content Type	Credit
BVDT-104	Bio Medical Waste management	skill	4

UNIT-1

Definition of Biomedical Waste, Waste minimization

UNIT-2

BMW – Segregation, collection, transportation, treatment and disposal (including color coding) Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste

UNIT-3

BMW Management & methods of disinfection, Modern technology for handling BMW

UNIT-4

Use of Personal protective equipment (PPE), Monitoring & controlling of cross infection (Protective devices)

Course Outcomes:

Upon completion of this course the student will be able to:

CO1. To Understand biomedical waste, methods for minimizing environmental impact.

CO2. Recognize Biomedical waste handling, including segregation, collection, transportation, treatment, disposal.

CO3. Recognize BMW management, disinfection methods, and modern handling technology.

CO4. Use PPE, monitoring, and controlling cross infections with protective devices.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	3	3	2	2	2	3	2
CO 2	3	2	3	3	2	2	2	3	2
CO 3	3	2	2	2	2	2	2	3	2
CO 4	3	3	2	3	2	2	2	3	3

Course Code	Course Name	Content Type	Credit
BVCCT-105	Fundamentals of computer	General	3

Unit-1

Introduction to Computers, History of Computer, Generations, Characteristics, Advantages and limitations of Computer, Classification of Computers, Functional Components of Computer, input, Output and Processing, Concept of Hardware and Software, Data & Information. Concept of data storage. Number system. Decimal, Binary, Hexadecimal ASCII.

UNIT-2

Introduction to GUI Based Operating System Basics of Operating system, Basics of DOS & LINUX, The User interface, File and directory management, Windows setting, Control Panel, devices and Printer setting, Using various window commands for desktop.

UNIT-3

Word Processing, Word processing basics, Menu Bar, Opening and closing documents, save & save as, Page setup, print preview, and printing. Text creation and manipulation Editing, cut copy paste. Document creation, editing, Formatting the text – Paragraph indenting, bullets and numbering, changing case, Table manipulation – creation of table, insertion and deletion of cell, row and column.

UNIT-4

Network basics, Internet Basics of computer network LAN, WAN etc, Concept of Internet, Basic of Internet Architecture, Services on Internet Architecture, World wide web and websites, Communication on Internet, Internet Services, Preparing Computer for Internet Access, ISPs and Examples, Internet Access Technologies. Web Browsing, configuring web browser, Popular search engines Downloading and printing web pages. Internet application Basics of E-mail, E-mail addressing, forwarding and searching, Composing.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Identify the functional components of a computer system, including input devices, output devices, and central processing units.

CO 2. Apply knowledge of operating system basics to troubleshoot common issues and optimize system performance.

CO 3. Demonstrate in creating and manipulating text, including editing, cutting, copying, and pasting.

CO 4. Demonstrate in communication on the Internet, including sending and receiving emails and using messaging services.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	2	2	3	2	2
CO 2	3	2	2	2	2	2	3	2	3
CO 3	3	2	2	3	2	3	3	2	3
CO 4	3	2	2	2	2	3	2	2	3

Course Code	Course Name	Content Type	Credit
BVCCT-106	General English and soft skill	General	2

Unit-1 Introduction to English language

- Role and significance of English language in the present scenario
- English language: its relevance for the Indian industry.
- Introduction to listening, speaking, reading, writing and bench marking of the class.

Unit 2: Grammar and usage

Verbs

Determiners

Active Voice and Passive Voice

Tenses

Unit 3:

Letter writing & Notice Writing

Unit 4:

Précis and Report writing

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Recognize the relevance of English language proficiency for the Indian industry, particularly in sectors such as information technology, business process outsourcing, and international trade.

CO 2. Demonstrate proficiency in using different grammatical structures, including sentence types, verb forms, and agreement.

CO 3. Apply knowledge and skills acquired in letter and notice writing to real-world scenarios, such as job applications, invitations, or announcements.

CO 4. Apply précis and report writing skills in academic, professional, and organizational settings to communicate information effectively and persuasively.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	3	3	3	2	2	3
CO 5	3	3	3	3	2	3	2	3	3

Course Code	Course Name	Content Type	Credit
BVCCTP-101	Human Anatomy and Physiology -1 Lab	Skill	2

Human anatomy (practical)

Demonstration of

- Study of Human Skeleton parts with skeletal models.

- Study with charts and models of all organ systems mentioned above.
- Microscopic slides examination of elementary human tissues, cells.
- Major organs through models and permanent slides.
- Parts of circulatory system from models.
- Parts of respiratory system from models.
- Digestive system from models.

Excretory system from models.

Human Physiology (Practical)

- To measure pulse rate
- To measure blood pressure
- To measure temperature
- Measurement of the Vital capacity
- Determination of blood groups
- Transport of food through esophagus
- Calculation and evaluation of daily energy and nutrient intake.
- Measurement of basal metabolic rate
- Demonstration of ECG
- Bile juice secretion and excretion

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Develop proficiency in using laboratory equipment and techniques for anatomical and physiological experiments, such as microscopy, physiological measurements, and data analysis.

CO 2. To understand the relationship between anatomical structures and their functions in the human body.

CO 3. Develop critical thinking and problem-solving skills through the design and execution of laboratory experiments.

CO 4. Develop practical experience in identifying anatomical structures of the Human Body.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	2	2	3	2	2
CO 2	3	2	2	2	2	2	3	2	3

CO 3	3	2	2	3	2	3	3	2	3
CO 4	3	2	2	2	2	3	2	2	3

Course Code	Course Name	Content Type	Credit
BVCCTP-102	General Biochemistry Lab	Skill	2

General Bio Chemistry Lab

- Analysis of Normal Urine
- Liver Function tests
- Lipid Profile
- Renal Function test
- Blood gas and Electrolytes
- Demonstration of Glucometer with strips

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Interpret lipid profile results to assess cardiovascular risk and lipid metabolism.

CO 2. Develop practical skills in performing biochemical experiments and analyses using laboratory equipment and techniques.

CO 3. Apply quality control measures and standard operating procedures to ensure the accuracy & reliability.

CO 4. Prepare to troubleshoot experimental procedures and equipment issues encountered during biochemical analyses.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Content Type	Credit
BVDTP-103	Introduction to kidney Disease and Renal replacement therapy Lab	Skill	2

DEMONSTRATION OF:

- Effect of Kidney Disease
- Chronic Kidney Disease.
- Acute Kidney injury
- Sign and symptoms of Kidney disease.
- General Laboratory assessment of Kidney Disease.
- Haemodialysis Basics
- Peritoneal Dialysis Basics

Course Outcomes:

Upon completion of this course the student will be able to:

1. Understanding physiological, psychological, and socioeconomic impacts of kidney disease.
2. Identifying managing, and mitigating complications of chronic kidney disease.
3. Recognizing, diagnosing, and managing complications of Acute Kidney Injury.
4. Identifying edema, fatigue, hypertension, proteinuria, hematuria, and electrolyte imbalances.
5. Interpreting lab results, diagnosing kidney disease, monitoring treatment effectiveness.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	3	2	2	2	2	3	2
CO 2	3	2	3	2	2	2	2	3	2
CO 3	3	3	2	2	2	2	2	2	2
CO 4	3	3	2	3	2	2	2	3	3
CO 5	3	2	2	3	2	2	2	2	3

Course Code	Course Name	Content Type	Credit
BVDTP-104	Bio Medical Waste Management Lab	Skill	2

- Waste minimization
- Color coding

- Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste
- BMW Management & methods of disinfection
- Modern technology for handling BMW
- Use of Personal protective equipment (PPE)

Course Outcomes:

Upon completion of this course the student will be able to:

1. Understanding waste reduction methods, color coding for effective segregation.
2. Understanding liquid BMW, radioactive, metals, chemicals, and drug waste responsibly.
3. Effective BMW management, disinfection methods, ensuring safety and environmental protection.
4. Understanding PPE usage to ensure safety during healthcare activities.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	2	2	2	3	2
CO 2	3	3	2	3	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	2
CO 4	3	2	2	3	2	2	2	3	3

Course Code	Course Name	Content Type	Credit
BVCCTP-105	Fundamentals of computer Lab	Skill	2

Fundamentals of Computer Lab

- Starting MS WORD, Creating and formatting a document,
- Changing fonts and point size,
- Table Creation and operations, Autocorrect, Auto text, spell Check, Word Art, Inserting Objects, Page setup, Page Preview, Printing a document, Mail Merge.
- Starting Excel, Work sheet, cell inserting Data into Rows/ Columns, Alignment, Text wrapping , Sorting data, Auto Sum, Use of functions, referencing formula cells in other formulae , Naming cells, Generalisation graphs, Worksheet data and charts with WORD, Creating
- Hyperlink to a WORD document, Page set up, Print Preview, Printing Worksheets.
- Starting MS–Power Point,, Creating a presentation using auto content Wizard, Blank Presentation, creating, saving and printing a presentation, Adding a slide to presentation,
- Navigating through a presentation, slide sorter, slide show, editing slides, Using Clipart, Word
- Art gallery, Adding Transition and Animation effects, setting timings for slide show, preparing
- Note pages, preparing audience hand-outs, printing presentation documents, MS- Access,

- Creating tables and database, Internet, Use of Internet (Mailing, Browsing, and Surfing).

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate proficiency in using Microsoft Office applications including Word, Excel, PowerPoint, and Access.

CO 2. To understand best practices for organizing files, managing projects, and optimizing workflow using Microsoft Office tools to enhance professionalism and productivity.

CO 3. Apply knowledge of basics of MS Office and its application to troubleshoot common issues.

CO 4. Demonstrate proficiency in effective Utilization of Internet Tools.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

BVOC (Dialysis Technology) 2nd Sem

Course Code	Course Name	Content	Credit
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		Type	
BVDT-201	General Human Anatomy & Physiology-II	General	4

UNIT-1

Cardiovascular system: Basic anatomy of heart and important blood vessels Brief introduction about Lymphatic System, The Nervous System: Basic anatomy of brain and spinal cord, meninges and cerebrospinal fluid, Cranial, Endocrine System: Brief anatomy of Pituitary, Thyroid, Parathyroid, Pancreas, Adrenal, Special Senses: Basic anatomy of eye, ear and nose

UNIT-2

Genitourinary system: Basic anatomy of kidney and associated organs, male reproductive organs, female reproductive organs, Respiratory system: Basic anatomy of nose, larynx, trachea, bronchi and lung, Digestive system: basic anatomy of esophagus, stomach, small intestine, large intestine, liver, gall bladder, pancreas

UNIT-3

Cardiovascular system-general arrange, heart, arteries, veins and capillaries, heart structure and function, cardiac cycle, heart sounds, heart rate, blood pressure, mechanism of circulation, definition of hypertension & shock ,Respiratory system: parts of respiratory system, mechanism of respiration, pulmonary function, pulmonary circulation, lungs volume, Gas transport between lungs and tissues, Definition of hypoxia, dyspnea, cyanosis, asphyxia and obstructive airways diseases Unit, Gastrointestinal physiology: Organs of GIT and their structure & function, secretion, digestion, absorption and assimilation, gastrointestinal hormones, physiology of digestion of carbohydrates, proteins & lipids, Structure & function of liver, spleen, gall bladder & pancreas, Jaundice, Cirrhosis & Pancreatitis.

UNIT-4

Excretory System: Kidneys, Nephron, Mechanism of Excretion, Urine formation (Glomerular filtration and Tubular reabsorption) , Electrolytes: their balances and imbalances Introduction of acidosis and alkalosis , Muscle nerve physiology, types of muscles, their gross structural and functional difference with reference to properties ,Nervous system- general organization of CNS, function of important structure and spinal cord, neuron, nerve impulse, type of nerves according to function, Autonomic nervous system organization & function Special senses-general organization & functions, Endocrine System: Brief introduction about endocrine glands and their secretion, common endocrinological disorder such as diabetes mellitus, hyper & hypothyroidism, dwarfism, gigantism, tetany. Reproductive System: male & female reproductive organs, sex hormones, secondary sexual characteristics, puberty, spermatogenesis, oogenesis, menstrual cycle, pregnancy, menopause, contraceptive measures.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1 Understanding cardiovascular, lymphatic, nervous, endocrine systems, and special senses' anatomy and functions.

CO 2 Understanding genitourinary, respiratory, digestive systems' anatomy, including associated organs and functions.

CO 3 Understanding cardiovascular, respiratory, gastrointestinal physiology, including circulation, respiration, and digestion processes.

CO 4 Understanding in excretory system, electrolyte balance, muscle-nerve physiology, nervous system, special senses, and endocrine disorders.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	2	2	3	3
CO 3	3	3	2	3	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Content Type	Credit
BVDT-202	General Pathology & Microbiology	Skill	4

UNIT-1

Pathology: General Definition of Pathology Cellular adaptation, Cell injury & cell death, Inflammation, Genetic disorders.

UNIT-2

Immunity disorders. Infectious diseases. Clinical relevance of Pathological test, various diagnostic tests. Collection and transportation of sample, commonly submitted samples, Types of specimens, Laboratory assessment of renal function

Renal Biopsy, Renal Biopsy in transplant

UNIT-3

Microbiology: Identification of common infections, Infection and transmission of disease,

UNIT-4

Types & principles of Disinfections

Sterilization- steam Autoclave sterilization, ETO sterilization, Gamma ray's sterilization, Chemical Disinfectants -formaldehyde, clinitest, per acetic acid, sterilant test. Laboratory test and method of collection of specimens for culture, Common pathogenic bacteria, General Principle of Infection control. Hospital waste management.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1 Understanding pathology basics: cellular adaptation, injury, inflammation, and genetic disorders' mechanisms and implications.

CO2 Demonstrate Proficiency in immunity disorders, infectious diseases, and clinical application of pathological tests, including sample handling, renal function assessment, and renal biopsies.

CO3 Understanding of microbiology: identifying common infections and understanding disease transmission.

CO4 Demonstrate Proficiency in disinfection and sterilization principles, including various methods and laboratory specimen collection for culture, emphasizing infection control and hospital waste management.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	2	2	2	3	2
CO 2	3	3	2	3	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	2
CO 4	3	2	2	3	2	2	2	3	3

Course Code	Course Name	Content Type	Credit
BVDT-203	Principle and types of Dialysis	General	3

UNIT-1

Physiology of Dialysis, Basics of Dialysis, Haemodialysis, Haemodialysis Procedure,

UNIT-2

Haemodialysis apparatus, Vascular Access for dialysis, Reuse of Dialyser.

UNIT-3

Peritoneal Dialysis, Basics of Peritoneal dialysis, Types of PD,

UNIT-4

CAPD, Indications and contraindication for CAPD.

Complication – infectious and non-infectious complications

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding dialysis physiology and basics, including haemodialysis procedures.

CO2 Demonstrate Proficiency in using haemodialysis apparatus, establishing vascular access, and reusing dialyzers.

CO3 Understanding of peritoneal dialysis fundamentals, including types and procedures.

CO4 Demonstrate Proficiency in continuous ambulatory peritoneal dialysis (CAPD), recognizing indications, contraindications, and managing infectious and non-infectious complications.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	2	2	2	2	3	2
CO 2	2	2	2	2	2	2	2	2	2
CO 3	3	2	2	3	2	2	2	3	2
CO 4	2	2	2	2	2	2	2	3	2

Course Code	Course Name	Content Type	Credit
BVDT-204	Introduction of patient safety	skill	3

UNIT-1

Concepts of Quality of Care, Quality Improvement Approaches, Standards and Norms, Quality Improvement Tools , Basic emergency care – first aid and triage, Ventilations including use of bag-valve-masks (BVMs)Choking, rescue breathing methods One- and Two-rescuer CPR, Using an AED (Automated external defibrillator).

UNIT-2

Managing an emergency including moving a patient Introduction to NABH guidelines, Evidence-based infection control principles and practices [such as sterilization, disinfection, effective hand hygiene and use of Personal protective equipment, (PPE)], Prevention & control of common healthcare associated infections, Components of an effective infection control program, and Guidelines (NABH and JCI) for Hospital Infection Control, History of Antibiotics

UNIT-3

Types of resistance- Intrinsic, Acquired, Passive, Trends in Drug Resistance, Actions to Fight Resistance, Bacterial persistence, Antibiotic sensitivity, Consequences of antibiotic resistance, Antimicrobial Stewardship- Barriers and opportunities, Tools and models in Hospitals

UNIT-4

Fundamentals of emergency management, Psychological impact management, Resource management, Preparedness and risk reduction, Key response functions (including public health, logistics and governance, recovery, rehabilitation and reconstruction), information management, incident command and institutional mechanisms.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1 Understanding quality of care concepts, improvement approaches, emergency care including CPR, ventilation, choking management, and AED usage.

CO2 Understanding in emergency management, NABH guidelines, evidence-based infection control, prevention of healthcare-associated infections, and effective infection control program components.

CO3 Understanding of antibiotic resistance types, consequences, antimicrobial stewardship, and tools/models in hospitals.

CO4 Demonstrate Proficiency in emergency management fundamentals, psychological impact, resource and risk management, response functions, and institutional mechanisms for incident command and recovery.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	2	2	2	3	3
CO 2	3	2	3	3	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3
CO 4	3	2	2	3	2	2	2	3	3

Course Code	Course Name	Content Type	Credit
BVDT-205	Medical terminology and record keeping	General	3

UNIT-1

Derivation of medical terms, Define word roots, prefixes, and suffixes, Conventions for combined morphemes and the formation of plurals.

UNIT-2

Basic medical terms, Form medical terms utilizing roots, suffixes, prefixes, and combining roots, Interpret basic medical abbreviations/symbols.

UNIT-3

Utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system, musculoskeletal system, respiratory system, cardiovascular system, nervous system, and endocrine system, Interpret medical orders/reports, Data entry and management on electronic health record system.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding medical terminology derivation, word roots, prefixes, suffixes, and conventions for combined morphemes and plurals formation.

CO2 Demonstrate Proficiency in basic medical terms formation using roots, prefixes, and suffixes, and interpreting medical abbreviations and symbols.

CO3 Understanding of diagnostic, surgical, and procedural terms related to various body systems, interpreting medical orders/reports, and managing electronic health record data.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	3	3	2	3	3
CO 2	3	2	2	3	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3

Course Code	Course Name	Type of Course	Credits
BVCCT-206	Basics of Health Market & Economy	General	3

Unit I

Health Care Market An Introduction : Main Problems in the Market for Health Care, Health Care and Economic Basics, Analyzing Health Care Markets. Demand-Side Considerations: Demand for Health and Health Care, Market for Health Insurance

Unit II

Supply-Side Considerations: Managed Care, Health Care Professionals, Hospital Services, Confounding Factors Public Policy in Medical Care: Policies to Enhance Access, Policies to Contain Costs, Medical Care Systems Worldwide,

UNIT-III

Health Sector in India: An Overview Health Outcomes; Health Systems; Health Financing Evaluation of Health Programs Costing, Cost Effectiveness and Cost-Benefit Analysis; Burden of Diseases ,Role of WHO , Health Care Budget: purpose, types & practices in Indian context.

UNIT-IV

Health Economics: Fundamentals of Economics: Scope & coverage of Health Economics, demand for Health Sciences; Health as an investment, population, Health & Economic Development. Tools of Economics-Concepts of need, demand, supply & price in Health Services. Methods & Techniques of Economic Evaluation of Health Programmes: Cost benefit & cost effective methods-output & input analysis.

Market, monopoly, perfect & imperfect competition. Health Financing from various sources – Public, Private, TPA. Economics of Health Programmes for Nutrition, diet & population control, economics of abuse of tobacco & alcohol, environmental influences on health and feeding. Economics of Communicable (STDs & Malaria) & non-communicable (IHD & Cancers) diseases.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To Understand and analysis of Health Care Market Dynamics

CO 2. To understand economic concepts such as need, demand, supply, and price in health services, as well as methods and techniques for economic evaluation of health programs, including cost-benefit and cost-effectiveness analysis.

CO 3. Able to provide students with a comprehensive understanding of health care markets, policies, and economics, enabling them to analyze and evaluate health care systems, policies, and programs effectively, and make informed decisions in health care management and policy development.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3

Course Code	Course Name	Content Type	Credit
BVDTP-201	General Human Anatomy & Physiology-II Lab	Skill	2

Human Anatomy-II (Practical)

Demonstration of:

- Nervous system from models.
- Structure of eye and ear
- Structural differences between skeletal, smooth and cardiac muscles.
- Various bones
- Various joints
- Various parts of male & female reproductive system from models

Human Physiology- II (Practical)

- To perform total platelet count.
- To perform bleeding time.
- To perform clotting time.
- To study about CSF examination.
- To study about intrauterine contraceptive devices.
- To demonstrate microscopic structure of bones with permanent slides.

To demonstrate microscopic structure of muscles with permanent slides.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding nervous system structures, eye and ear anatomy, muscle types, bones, joints, and male/female reproductive system components using models.

CO2 Analyze tests like total platelet count, bleeding/clotting time, and understand CSF examination and intrauterine contraceptive devices.

CO3 Demonstrate microscopic bone and muscle structures using permanent slides, fostering in-depth anatomical comprehension and proficiency in physiological assessments for comprehensive learning and clinical practice.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	3	3	3	3	2	3	3
CO 2	3	2	3	3	2	2	2	3	3
CO 3	3	2	3	3	2	2	2	3	3

Course Code	Course Name	Content Type	Credit
BVDTP-202	General Pathology & Microbiology Lab	Skill	2

- Collection and transportation of sample,
- commonly submitted samples,

- Types of specimens,
- Laboratory assessment of renal function
- Renal Biopsy,
- Renal Biopsy in transplant
- sterilization- steam Autoclave sterilization,
- ETO sterilization,
- Gamma rays sterilization,
- Chemical Disinfectants -formaldehyde, clinitest, per acetic acid, sterilant test.
- Laboratory test and method of collection of specimens for culture, Common pathogenic bacteria,

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Demonstrate Proficiency in collecting and transporting samples, recognizing commonly submitted specimens, and understanding types of specimens.

CO2 To Understand in laboratory assessment of renal function, renal biopsy techniques, and handling renal biopsy in transplants.

CO3 To understand of sterilization methods like steam autoclave, ETO, gamma rays, and chemical disinfectants.

CO4 Understanding with laboratory tests, specimen collection for culture, and identification of common pathogenic bacteria.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	3	2	2	3	3
CO 2	3	2	3	3	3	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3
CO 4	3	2	2	3	2	2	2	3	3

Course Code	Course Name	Content Type	Credit
BVDTP-203	Principle and types of Dialysis Lab	Skill	2

- Haemodialysis, Haemodialysis Procedure,
- Haemodialysis apparatus,
- Vascular Access for dialysis,
- Reuse of Dialyser.
- Peritoneal Dialysis,
- Basics of Peritoneal dialysis, Types of PD, CAPD.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding of haemodialysis procedures, apparatus, and vascular access, facilitating safe and effective treatment.

CO2 Understanding in dialyzer reuse techniques, adhering to quality standards.

CO3 Understanding of peritoneal dialysis fundamentals, including types and continuous ambulatory peritoneal dialysis (CAPD), enabling comprehensive patient care and management

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	2	3	3	2	2	3
CO 2	3	2	2	2	3	2	3	2	3
CO 3	3	2	2	2	2	3	3	2	3

Course Code	Course Name	Content Type	Credit
BVDTP-204	Introduction of patient safety Lab	Skill	2

DEMONSTRATION OF:

- Basic emergency care – first aid and triage
- Ventilations including use of bag-valve-masks (BVMs) Choking, Using an AED (Automated external defibrillator).
- Managing an emergency including moving a patient Introduction to NABH guidelines
- Prevention & control of common healthcare associated infections,
- Actions to Fight Resistance
- Bacterial persistence
- Antibiotic sensitivity
- Consequences of antibiotic resistance
- Antimicrobial Stewardship- Barriers and opportunities, Tools and models in Hospitals

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding in basic emergency care, triage, and use of essential medical devices like bag-valve-masks and AEDs.

CO2 Understanding to manage emergencies and transfer patients while adhering to NABH guidelines.

CO3 Understanding in preventing and controlling healthcare-associated infections, combating resistance, understanding antibiotic sensitivity, consequences of resistance, and implementing antimicrobial stewardship practices, including tools and models in hospital settings.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	3	2	3	3	2	2	3
CO 2	3	2	3	2	3	3	3	3	3
CO 3	3	2	3	2	2	3	3	2	3

Course Code	Course Name	Content Type	Credit
BVDTP-205	Medical terminology and record keeping Lab	Skill	2

DEMONSTRATION OF:

- Basic medical terms.
- Form medical terms utilizing roots, suffixes, prefixes, and combining roots.
- Interpret basic medical abbreviations/symbols.
- Utilize diagnostic, surgical, and procedural terms and abbreviations related to the Interpret medical orders/reports.
- Data entry and management on electronic health record system.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding of basic medical terminology and the ability to form medical terms using roots, suffixes, prefixes, and combinations.

CO2 Understanding of basic medical abbreviations and symbols for effective communication.

CO3 Understanding in utilizing diagnostic, surgical, and procedural terms and abbreviations, and interpreting medical orders/reports accurately.

CO4 Understanding in data entry and management within electronic health record systems, ensuring accurate and efficient documentation

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	2	2	2	3	3
CO 2	3	2	3	3	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3
CO 4	3	2	2	3	2	2	2	3	3

BVOC (Dialysis Technology) **3rd Sem**

Course Code	Course Name	Content Type	Credit
BVDT-301	Applied Human Anatomy & Physiology related to dialysis technology	General	4

UNIT-1

Basic anatomy of urinary system: structural anatomy of kidney, bladder, ureter, urethra, prostate, Histology of kidney, Blood supply of kidney, Development of kidney in brief, Anatomy of peritoneum including concept of abdominal hernias.

UNIT-2

Anatomy of vascular system: Upper limb vessels: course, distribution, branches, origin & abnormalities, Neck vessels: course, distribution, branches, origin & abnormalities, Femoral vessels: course, distribution, branches, origin & abnormalities.

UNIT-3

Mechanism of urine formation, Glomerular filtration rate (GFR), Clearance studies.

Physiological values of urea, creatinine, electrolytes, calcium, phosphorous, uric acid, magnesium, glucose; 24 hours urinary indices – urea, creatinine, electrolytes, calcium, magnesium.

UNIT-4

Physiology of renal circulation

a. Factors contributing & modifying renal circulation.

b. Auto regulation.

Hormones produced by kidney & physiologic alterations in pregnancy.

Haemostasis: coagulation cascade, coagulation factors, auto regulation, BT, CT, PT, PTT, thrombin time.

Acid base balance: basic principles & common abnormalities like hypokalaemia, hyponatremia, hyperkalaemia, hypernatremia, hypocalcaemia, hypercalcemia, pH, etc.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 To Understand the basic anatomy of the urinary system, including the structural anatomy of kidney, bladder, ureter, urethra, prostate, and peritoneum.

CO2 Classification on the anatomy of the vascular system, detailing upper limb vessels, neck vessels, and femoral vessels.

CO3 Explain into the mechanism of urine formation, GFR, clearance studies, and physiological values of various substances in urine.

CO4 Define renal circulation physiology, hormones produced by the kidney, haemostasis, and acid-base balance principles with common abnormalities.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	2	2	2	3	3
CO 2	3	2	3	3	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3
CO 4	3	2	2	3	2	2	2	3	3

Course Code	Course Name	Content Type	Credit
BVDT-302	Applied pathology and microbiology related to dialysis department	Skill	4

UNIT-1

Pathology, Congenital abnormalities of urinary system, Classification of renal diseases, Glomerular diseases: causes, types & pathology, Tubulo-interstitial diseases.

UNIT-2

Renal vascular disorders, End stage renal diseases: causes & pathology, Pathology of kidney in hypertension, diabetes mellitus, pregnancy, Pathology of peritoneum, peritonitis, bacterial, tubular &

sclerosing peritonitis, dialysis induced changes, Pathology of urinary tract infections, Pyelonephritis & tuberculous pyelonephritis

UNIT-3

Microbiology, Hepatotrophic viruses in detail: mode of transfusion, universal precautions vaccinations, Human immunodeficiency virus (HIV), mode of transfusion, universal precautions, Opportunistic infections.

UNIT-4

Microbiology of urinary tract infections, Microbiology of vascular access infection (femoral, jugular, subclavian catheters), Sampling methodologies for culture & sensitivity.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 To understand pathology, congenital abnormalities, classification of renal diseases, and glomerular and tubulo-interstitial diseases.

CO2 To understand renal vascular disorders, end-stage renal diseases, kidney pathology in hypertension, diabetes, peritoneal pathology, and urinary tract infections.

CO3 Recognize microbiology, hepatotrophic viruses, HIV, and opportunistic infections.

CO4 To understand microbiology of UTIs, vascular access infections, and sampling methodologies.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Content Type	Credit
BVDT-303	Equipment in dialysis	General	2

UNIT-1

Introduction to equipment used in dialysis, Dialysis Machine, Water treatment system equipment

UNIT-2

Operation and routine Maintenance of dialysis machine, Operation and routine Maintenance of Water treatment system, CAPD machine, APD machine

UNIT-3

CRRT machine, Body composition monitor., Use of dialysis machine in other extracorporeal therapy

UNIT-4

Emergency Equipment in Dialysis Pulse oximeter, Defibrillator, Patient monitor, ECG machine and suction machine, Dialyser reprocessing machine.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Explain dialysis equipment including dialysis machines and water treatment systems.

CO2 To understand the operation and routine maintenance of dialysis machines, water treatment systems, CAPD, and APD machines.

CO3 Discusses on CRRT machines, body composition monitors, and the use of dialysis machines in other extracorporeal therapies.

CO4 discusses emergency equipment such as pulse oximeters, defibrillators, patient monitors, ECG machines, suction machines, and dialyser reprocessing machines.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	2	2	2	2	2	3
CO 2	3	2	2	2	2	2	2	2	3
CO 3	3	2	2	2	2	2	2	2	2
CO 4	3	2	2	2	2	2	2	3	2

Course Code	Course Name	Content Type	Credit
BVDT-304	Applied Dialysis Technology- I	skill	4

Unit-1

History of Dialysis, Basics of Dialysis.

Unit-2

Dialysis System components, Dialyser, Dialysate

Unit-3

Dialysis machine, Physiological Principle of Dialysis, Haemodialysis Equipment

Unit-4

Dialyser reuse, Water Treatment for Haemodialysis

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 To understand the historical evolution of dialysis and grasp the fundamental principles underlying the procedure.

CO2 Identify and explain the key components of dialysis systems, including dialysers and dialysate composition.

CO3 To understand the functioning of dialysis machines, the physiological basis of dialysis, and the equipment used in hemodialysis.

CO4 Analyze the process of dialyser reuse and the essential techniques for water treatment in hemodialysis, ensuring comprehensive understanding and application of safety protocols.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	2	2	2	3	3
CO 2	3	2	3	3	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3
CO 4	3	2	2	3	2	2	2	3	3

Course Code	Course Name	Content Type	Credit
BVDT-305	Advance Computing skills	General	2

Unit-1

Advance Word Processing Tools, Setting the layout of Table and documents, Mail merge techniques. Letter envelopes etc, Using spell check and Thesaurus, Foot note nad Endnotes, Using Charts , shapes and pictures in word .

Unit-2

Basics of Spreadsheet, Functions of Spreadsheet , Applications , Elements of Electronic Spread sheet ,creating document saving and printing the worksheet, manipulation of cells ,Functions and charts, using formulas , Functions and charts

UNIT-3

Advance Spreadsheet Tools, Manipulations with charts and its types, Sorting, Filtering of data ,Pivot table, data validation techniques. Grouping and subtotaling of data. Text to column option . Printing of customized worksheet.

UNIT-4

Presentation Software, Using Powerpoint, Opening an powerpoint presentation, Saving a presentation , Entering and editing text, inserting and deleting slides in a presentations , preparation of slides , adding clip arts, charts etc., Providing Aesthetics , Enhancing text presentation ,working with color lines styles and movie and sound ,adding header and footer, presentation.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To develop proficiency in **Advanced Word Processing Features**

CO 2. To develop proficiency in **Advanced Spreadsheet Techniques**

CO 3. To develop proficiency in **Presentation Software.**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVDT-306	Human Values & Professional Ethics	General	4

UNIT-1

Need, Basic Guidelines, Content and Process for Value Education

Understanding the need, basic guidelines, content and process for Value Education

Self-Exploration its content and process, Natural Acceptance' and Experiential Validation- as the mechanism for self-exploration

Continuous Happiness and Prosperity- A look at basic Human Aspirations

Right understanding, Relationship and Physical Facilities- the basic requirements for fulfilment of aspirations of every human being with their correct priority

Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario

Method to fulfil the above human aspirations: understanding and living in harmony at various levels

UNIT 2:

Understanding Harmony in the Human Being Understanding human being

Understanding the Body as an instrument

Understanding the harmony of Body, correct appraisal of Physical needs, meaning of Prosperity in detail

UNIT 3:

Understanding Harmony in the Family and Society-
Harmony in Human Relationship

Understanding Harmony in the family – the basic unit of human interaction

Understanding values in human-human relationship

Trust and Respect as the foundational values of relationship

Understanding the meaning of trust

Difference between intention and competence. Understanding the meaning of respect

Understanding the harmony in the society (society being an extension of family)

UNIT-4

Natural acceptance of human values

Definitiveness of Ethical Human Conduct

Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order

Competence in professional ethics:

a) Ability to utilize the professional competence for augmenting universal human order

b) Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,

c) Ability to identify and develop appropriate technologies and management patterns for above production systems.

Case studies of typical holistic technologies, management models and production systems

Strategy for transition from the present state to Universal Human Order:

a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers

b) At the level of society: as mutually enriching institutions and organizations

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To develop competence in professional ethics, including utilizing professional skills to promote universal human order and identifying people-friendly and eco-friendly production systems.

CO 2. To understand the human body as an instrument and its role in achieving harmony.

CO 3. To understand the concept of self-exploration and the role of "natural acceptance" and experiential validation in this process.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVDTP-301	Applied Human Anatomy & Physiology related to dialysis technology Lab	Skill	2

- Anatomy of urinary system:
- structural anatomy of kidney, bladder, ureter, urethra, prostate.
- Histology of kidney.
- Blood supply of kidney.
- urine formation.
- Glomerular filtration rate (GFR).
- Haemostasis: coagulation cascade, coagulation factors, auto regulation, BT, CT, PT, PTT, thrombin time.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding anatomical structures of the urinary system including kidney, bladder, ureter, urethra, and prostate for comprehensive clinical assessment and intervention.

CO2 Understanding kidney histology, blood supply, and urine formation processes to facilitate diagnosis and treatment of renal disorders effectively.

CO3 Understanding measurement and significance of Glomerular Filtration Rate (GFR) and understanding coagulation cascade, factors, regulation, and clotting time assessments.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	3	2	3	3	2	2	3
CO 2	3	2	3	2	3	3	3	3	3
CO 3	3	2	3	2	2	3	3	2	3

Course Code	Course Name	Type of Course	Credits
BVDTP-302	Applied pathology and microbiology related to dialysis department Lab	Skill	2

Demonstration of:

- renal diseases.
- Glomerular diseases
- Pathology of kidney in hypertension,
- diabetes mellitus, pregnancy.

- Pathology of urinary tract infections
- Pyelonephritis & tuberculous pyelonephritis
- Hepatotrophic viruses in detail: mode of transfusion, universal precautions vaccinations.
- sampling methodologies for culture & sensitivity.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Demonstrate Proficiency in diagnosing and managing renal diseases, glomerular disorders, and kidney pathology associated with hypertension for optimal patient care.

CO2 Understanding the interaction of diabetes mellitus and pregnancy, diagnosing urinary tract infections, and managing pyelonephritis and tuberculous pyelonephritis effectively.

CO3 Discuss knowledge of hepatotropic viruses transmission, universal precautions, vaccinations, and proficient understanding of culture and sensitivity sampling methodologies.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	2	3	3	2	2	3
CO 2	3	2	2	2	3	2	3	2	3
CO 3	3	2	2	2	2	3	3	2	3

Course Code	Course Name	Type of Course	Credits
BVDTP-303	Equipment in dialysis Lab	Skill	2

- Dialysis Machine
- Water treatment system equipment
- Operation and routine Maintenance of dialysis machine
- Operation and routine Maintenance of Water treatment system
- CAPD machine, APD machine
- CRRT machine
- Body composition monitor.
- ECG machine and suction machine

- Dialyser reprocessing machine.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Ability to operating and maintaining dialysis machines and water treatment systems for effective renal replacement therapy in clinical settings.

CO2 Ability to operation, maintenance of water treatment systems, CAPD, APD, and CRRT machines for optimal performance in renal therapy settings.

CO3 Analysis utilizing body composition monitors, ECG machines, suction machines, and dialyzer reprocessing machines for comprehensive patient care.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	2	2	2	3	3
CO 2	3	2	3	3	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3

Course Code	Course Name	Type of Course	Credits
BVDTP-305	Advance Computing skills Lab	Skill	2

Demonstration of:-

- Word Processing
- Mail merge techniques
- Using Charts , shapes and pictures in word .
- Basics of Spreadsheet
- document saving and printing the worksheet
- formulas , Functions and charts
- Advance Spreadsheet Tools
- worksheet.
- Presentation Software
- Using Powerpoint working with color lines styles and movie and sound ,presentations

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understanding the mail merge feature to personalize and automate mass communication.

CO 2. Ability to customize visuals to enhance document aesthetics and clarity.

CO 3. Ability to design and format slides effectively for visual appeal and clarity.

CO 4. Interpret necessary skills and knowledge to effectively utilize word processing, spreadsheet, and presentation software for various personal and professional tasks.

CO		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1		3	3	3	2	2	2	3	3	3
Course Code	Course Name				Type of Course	Credits				
BVD/TP-304	CO 2 Applied Dialysis Technology- I Lab	3	3	3	Skill	3	3	2	2	2
CO 3		3	3	3	3	3	3	3	2	2
CO 4		3	3	3	3	3	3	3	3	3

Demonstration of:

- Dialysis System components.
- Dialyser
- Dialysate
- Dialysis machine
- Haemodialysis Equipment
- Dialyser reuse
- Water Treatment for Haemodialysis

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding dialysis system components, dialyzer function, and dialysate composition for safe and effective hemodialysis treatment in clinical practice.

CO2 Ability to operating dialysis machines and haemodialysis equipment for delivering effective renal replacement therapy in clinical settings.

CO3 Ability to protocols for safe and efficient dialyzer reuse and ensuring high-quality water treatment standards for hemodialysis to prevent complications.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

BVOC (Dialysis Technology)

4th Sem

Course Code	Course Name	Type of Course	Credits
BVDT-401	Patient care in dialysis department	General	4

UNIT-1

Patient with Kidney failure, Patient Education, Machine and patient monitoring during haemodialysis, Patient Assessment – Pre, intra & post dialysis

UNIT-2

Care of Vascular Access, Lab data analysis, Acute and chronic dialysis prescription

UNIT-3

Medications in dialysis patients, Nutrition management in dialysis patients

UNIT-4

Renal Replacement Therapy and quality of life, Renal Transplant.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Demonstrate Proficiency in educating and monitoring kidney failure patients during hemodialysis, including comprehensive assessment throughout the dialysis process.

CO2 Understanding vascular access care, laboratory data interpretation, and prescribing acute and chronic dialysis treatments.

CO3 Understanding managing medications and nutrition for dialysis patients.

CO4 Understanding renal replacement therapy options and their impact on quality of life, including renal transplant considerations.

CO		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
Course Code	Course Name									
BVDT-402	Pharmacology	3	3	3	2	2	2	3	3	3
	CO 1	3	3	3	2	2	2	3	3	3
	CO 2	3	3	3	2	3	3	3	2	3
	CO 3	3	3	3	2	3	3	3	2	3
	CO 4	3	3	3	2	3	3	3	3	3

UNIT-1

Concepts of the interactions of chemical agents with living tissues, effect of drugs on the body, drugs and alteration of disease processes, toxicity effects. New drugs testing and development prior to use for patient care.

UNIT-2

Drug use in renal disease, drugs in special populations (the neonate and infant, the pregnant and elderly),

UNIT-3

pharmacokinetics, drug interactions, Definitions, routes of drug administration,

UNIT-4

Pharmacodynamics, adverse drug reactions, therapeutic drug, monitoring, pharmacogenomics and principles of individualization of drug therapy.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding chemical interactions with tissues, drug effects on the body, altering disease processes, toxicity, and pre-use testing of new drugs.

CO2 Understanding drugs in renal disease and special populations like neonates, infants, pregnant, and elderly patients.

CO3 Understanding pharmacokinetics, drug interactions, definitions, and routes of administration.

CO4 Demonstrate proficiency in pharmacodynamics, adverse reactions, therapeutic monitoring, pharmacogenomics, and personalized drug therapy principles.

Cour	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
BVDI-403	CO 1 Applied Dialysis Technology- IB				2 Skill	2	2	4	3	3
	CO 2	3	3	3	2	3	2	3	3	3
	CO 3	3	3	3	2	3	2	3	3	3
	CO 4	3	3	3	2	3	2	3	3	3

UNIT-1

Dialysis in special situations:

- a. Patients with congestive cardiac failure.
- b. Advanced liver disease.
- c. Patients positive for HIV, HBsAg & HCV.
- d. Failed transplant.
- e. Poisoning cases.
- f. Pregnancy.

UNIT-2

1. Dialysis in infants & children.
2. Special dialysis procedures:
 - a. Continuous therapies in hemodialysis.
 - b. Different modalities of peritoneal dialysis.
 - c. Haemodiafiltration.
 - d. Hemoperfusion.
 - e. SLED.
 - f. MARS.

UNIT-3

1. Special problems in dialysis patients:
 - a. Psychology & rehabilitation.
 - b. Diabetes
 - c. Hypertension.
 - d. Infections.
 - e. Bone diseases.
 - f. Aluminum toxicity.

UNIT-4

Plasmapheresis

Renal anemia management: chronic dialysis.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding dialysis for patients with congestive heart failure, advanced liver disease, HIV, HBsAg & HCV positive, transplant failure, poisoning, and pregnancy.

CO2 Understanding pediatric dialysis, continuous therapies, various peritoneal dialysis modalities, haemodiafiltration, hemoperfusion, SLED, and MARS.

CO3 Understanding psychological, diabetic, hypertensive, infectious, bone-related issues, and aluminum toxicity in dialysis patients.

CO4 Understanding plasmapheresis and managing renal anemia in chronic dialysis patients.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	2	2	2	3	3
CO 2	3	2	3	3	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3
CO 4	3	2	2	3	2	2	2	3	3

Course Code	Course Name	Type of Course	Credits
BVDT-404	Clinical dialysis-I	skill	3

UNIT-1

Complication during Haemodialysis, Anticoagulation in Haemodialysis.

UNIT-2

Infection control in dialysis, Strategies to maintain blood pressure during dialysis.

UNIT-3

Fluid and electrolyte management in dialysis patient, Dry weight in dialysis patient

UNIT-4

Water quality and dialysis outcome

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding on understanding complications during haemodialysis and effective anticoagulation methods.

CO2 To Understand into infection control protocols and strategies to stabilize blood pressure during dialysis sessions.

CO3 Examines fluid and electrolyte balance management along with determining dry weight in dialysis patients.

CO4 Examines the crucial link between water quality and dialysis outcomes.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Type of Course	Credits
BVDT-405	Medical law and ethics	General	4

UNIT 1

Medical ethics - Definition - Goal - Scope

Introduction to Code of conduct

UNIT 2

Basic principles of medical ethics –Confidentiality

Malpractice and negligence - Rational and irrational drug therapy

UNIT 3

Autonomy and informed consent - Right of patients

Care of the terminally ill- Euthanasia

UNIT 4

Organ transplantation, Medico legal aspects of medical records –Medico legal case and type- Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information - Unauthorized disclosure - retention of medical records - other various aspects, Professional Indemnity insurance policy, Development of standardized protocol to avoid near miss or sentinel events, Obtaining an informed consent

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Define medical ethics and understand its goals, scope, and relevance in healthcare practice.

CO 2. Understand concepts of malpractice and negligence in healthcare delivery and strategies for risk mitigation.

CO 3. Discuss the principles of patient autonomy and informed consent, including ethical considerations in treatment decision-making.

CO 4. Explain the principles of confidentiality and its importance in maintaining patient privacy and trust.

CO 5. Explore strategies for mitigating medico-legal risks and ensuring ethical conduct in healthcare practice.

Co	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
BVDT-406	CO 1 Advance communication and soft skill	3	3	3	2	2	2	3	3	3
	CO 2	3	3	3	3	3	3	2	2	2
	CO 3	3	3	3	3	3	3	3	2	2
	CO 4	3	3	3	3	3	3	3	3	3
	CO 5	3	2	3	2	3	3	3	2	2

UNIT-1

Functional Grammar-II

- Application writing
- Paragraph writing, essay writing and précis writing
- Pre-testing of oral and writing skills

UNIT-2

Professional Skills

- Biodata, CV and resume writing
- Joining letter, cover letter and resignation letter
- Inter- office memo, formal Business letter, informal notes
- Minutes of the meeting, reporting events, summary writing

UNIT-3

Presentation skills

- Power-point presentations and presenting techniques
- Body language
- Describing people, places and events
- Extempore, speech and just- a minute sessions

UNIT-4

Interview skills

- Developing skills to- debate, discussion, basics of GD and styles of GD
- Discussion in groups and group discussion on current issues
- Steps to prepare for an interview and mock interviews

Public speaking

- Art of public speaking
- Welcome speech
- Farewell speech
- Votes of thanks

Oral practice

- Debate
- Just-a-minute
- Group discussion
- Mock interviews

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate advanced verbal and non-verbal communication skills in various contexts, including presentations, meetings, and interpersonal interactions.

CO 2. Understand the proper use of grammar, punctuation, and formatting conventions to enhance

readability and professionalism.

CO 3. Demonstrate integrity, accountability, and ethical decision-making in leadership roles and team interactions.

Co	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
	CO 1	3	3	3	2	3	3	3	3	3
BVDTP-401	Patient care in dialysis department Lab	3	3	3	3	3	3	2	2	2
	CO 2	3	3	3	3	3	3	3	2	2
	CO 3	3	3	3	3	3	3	3	2	2

Demonstration of:

- Handling of Patient with Kidney failure
- Patient Education
- Machine and patient monitoring during haemodialysis
- Patient Assessment – Pre, intra & post dialysis
- Care of Vascular Access
- Lab data analysis
- Renal Replacement Therapy and quality of life
- Renal Transplant.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Able to identify the kidney failure patients, educate them, and monitor machines and patients during haemodialysis for optimal care.

CO2 Analyse patients before, during, and after dialysis, manage vascular access, and analyze laboratory data effectively for patient care.

CO3 Understand renal replacement therapy's impact on quality of life, explore renal transplant options, and comprehend their implications for patients.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	2	2	2	3	3
CO 2	3	2	3	3	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3

Course Code	Course Name	Type of Course	Credits
BVDTP-402	Pharmacology Lab	Skill	2

- Drug use in renal disease,
- drugs in special populations
- adverse drug reactions

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand drug usage implications in renal disease management.

CO2 Classify drug usage considerations in diverse patient populations.

CO3 Identify, manage, and prevent adverse reactions to medications effectively.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	2	3	2	3	3
CO 2	3	2	3	3	2	3	2	3	3
CO 3	3	2	2	3	2	3	2	3	3

Course Code	Course Name	Type of Course	Credits
BVDTP-403	Applied Dialysis Technology- II Lab	Skill	2

Demostartion of:

- Dialysis in special situations:
- Patients with congestive cardiac failure.
- Dialysis in infants & children.
- Special dialysis procedures: Continuous therapies in hemodialysis, Haemodiafiltration Hemoperfusion.
- SLED.
- MARS.
- Plasmapheresis
- Renal anemia management chronic dialysis.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding the Optimal dialysis care for congestive cardiac failure, infants, and children.

CO2 Understanding in continuous hemodialysis therapies and hemoperfusion technique.

CO3 Understanding in SLED and MARS therapeutic procedures.

CO4 Understanding in plasmapheresis and chronic dialysis renal anemia management.

Co	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
BVDTP-404	CO 1	3	3	3	2	Course 2 Skill	2	3	3	3
	Clinical dialysis-I Lab									
	CO 2	3	3	3	2	3	2	3	3	3
	CO 3	3	3	3	2	3	2	3	3	3
	CO 4	3	3	3	2	3	2	3	3	3

- Handling of Complication during Haemodialysis
- Anticoagulation in Haemodialysis.
- Strategies to maintain blood pressure during dialysis.
- Dry weight in dialysis patient

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Usefully manage complications arising during hemodialysis procedur

CO2 To Ability manage anticoagulation therapy during hemodialysis.

CO3 Understanding strategies for blood pressure maintenance during dialysis.

CO4 Describe and manage optimal dry weight for dialysis patients.

Co	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
BVDTP-405	CO 1	3	2	3	2	Course 2 Skill	2	2	3	3
	Medical law and ethics Lab									
	CO 2	3	2	3	2	3	2	2	3	3
	CO 3	3	2	3	2	3	2	2	3	3
	CO 4	3	2	3	2	3	2	2	3	3

- law and liability and duties of staff
- Workplace issues
- Bioethical issue
- Care and handling of patient
- Medico legal cases
- emergency care and life support skills
- CPR
- Vital signs and primary assessment
- bag-valve-masks

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the legal duties and responsibilities of healthcare staff in providing care to patients, ensuring patient safety, and maintaining confidentiality.

CO 2. Understand the importance of workplace safety and health regulations, including infection control measures, hazardous materials management, and ergonomic principles.

CO 3. Understand how to document patient care accurately, comprehensively, and ethically to meet legal and regulatory requirements.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2

BVOC (Dialysis Technology) Vth Sem

Course Code	Course Name	Type of Course	Credits
BVDT-501	Applied pharmacology related to dialysis	General	3

UNIT-1

Fluid therapy with special emphasis in renal diseases, Diuretics: classification, actions, dosage, side effects & contraindications, Anti-hypertensives: classification, actions, dosage, side effects & contraindications, special reference during dialysis, vasopressors, drugs used in hypotension.

UNIT-2

Drugs & dialysis: dose & duration of administration of drugs, Dialyzable drugs: phenobarbitone, lithium, methanol etc. Vitamin D & its analogues, phosphate binders, iron, folic acid & other vitamins of therapeutic value.

UNIT-3

Erythropoietin in detail, Heparin, low molecular weight heparin and heparin-induced thrombocytopenia, Protamine sulphate as antidote and indication.

UNIT-4

Alternative anticoagulants, Formalin, citrate, sodium hypochlorite, hydrogen peroxide: role as disinfectants & adverse, effects of residual particles applicable to formalin, Hemodialysis concentrates: composition & dilution (acetate & bicarbonates), Peritoneal dialysis fluid in particular hypertonic solutions: composition, Potassium exchange resins with special emphasis on mode of administration.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand fluid therapy in renal diseases, diuretics' classifications, actions, dosages, side effects, anti-hypertensives, vasopressors, and drugs for hypotension.

CO2 Understanding drug dosing in dialysis, dialyzable drugs (phenobarbitone, lithium, methanol), vitamin D, phosphate binders, iron, and vitamins therapy.

CO3 Understanding Erythropoietin therapy, Heparin, low molecular weight Heparin, Heparin-induced thrombocytopenia, and Protamine sulfate as antidote.

CO4 Understanding alternative anticoagulants, disinfectant roles of formalin, citrate, sodium hypochlorite, hydrogen peroxide, hemodialysis concentrates, peritoneal dialysis fluids, and potassium exchange resin administration.

Co	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
	CO 1	3	2	3	2	Course 2		2	3	3
BVDT-502	Clinical dialysis-II					Skill		3		
	CO 2	3	2	3	2	3	2	2	3	3
	CO 3	3	2	3	2	3	2	2	3	3
	CO 4	3	2	3	2	3	2	2	3	3

UNIT-1

Chronic medical problems in dialysis patient, Anaemia in dialysis patient

UNIT-2

Management of Renal bone disease, Endocrine dysfunction in dialysis patients.

UNIT-3

Hypertension in dialysis patient, Dialysis amyloidosis, cardiovascular disease in dialysis patient.

UNIT-4

Neurological problems in dialysis patient., Blood borne disease in dialysis patients

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding chronic medical issues in dialysis patients and management of anemia, ensuring comprehensive care and treatment strategies.

CO2 To understand renal bone disease management and endocrine dysfunction understanding, critical for comprehensive care of dialysis patients.

CO3 To understand managing hypertension, recognizing dialysis amyloidosis, and addressing cardiovascular diseases, pivotal for optimizing care in dialysis patients.

CO4 Understanding neurological complications, recognizing blood-borne diseases in dialysis patients, ensuring prompt diagnosis, and effective management strategies.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	2	2	2	2	3	2
CO 2	3	2	2	2	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3
CO 4	3	2	2	2	2	2	2	3	2

Course Code	Course Name	Type of Course	Credits
BVDT-503	Renal Nutrition	Skill	3

UNIT-1

Influence of kidney disease on protein, amino acid, and Carbohydrate and lipid metabolism.

Ca, Phosphate, PTH, and Vit D in CKD.

UNIT-2

Management of fluid and electrolyte in CKD, HD, CAPD, Nutritional management of HD patient.

UNIT-3

Nutritional management of CAPD patient, Nutritional management of renal transplant recipient, Nutritional management of AKI

Course Outcomes:

Upon completion of this course the student will be able to:

Unit-1 Examine the impact of kidney disease on protein, amino acid, carbohydrate, and lipid metabolism, along with the role of Ca, phosphate, PTH, and Vit D in CKD.

Unit-2 Understanding on fluid and electrolyte management in CKD, HD, CAPD, and nutritional strategies for HD patients.

Unit-3 Understanding nutritional approaches for CAPD patients, renal transplant recipients, and AKI management.

Course Name		Type of		Credits						
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	
CO 1	3	3	3	2	2	2	3	3	3	
CO 2	3	3	3	3	3	3	2	2	2	
CO 3	3	3	3	3	3	3	3	2	2	
Course Code										
BVDT-504	General medicine and general surgery				skill		4			

UNIT-1

MEDICINE

Pericarditis, Valvular diseases, Rheumatic Heart Disease, Heart failure, Chronic Bronchitis

UNIT-2

Emphysema, Brochitis, Pneumonia, Tuberculosis, Pleura effusion, Empyema, Spontaneous Phenumothorax

UNIT-3

Surgery, Cholelithiasis, Peritonitis, Suprahrenic Abscess

UNIT-4

Appendicitis, Benign Hypertrophy prostate, Sinusitis

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding Pericarditis, Valvular diseases, Rheumatic Heart Disease, Heart failure, Chronic Bronchitis.

CO2 Understanding and managing Emphysema, Bronchitis, Pneumonia, Tuberculosis, Pleural effusion, Empyema, and Spontaneous Pneumothorax with diagnostic and therapeutic approaches.

CO3 Relate learn surgical techniques and management for Cholelithiasis, Peritonitis, and Suprahepatic Abscess, focusing on diagnosis, treatment, and postoperative care.

CO4 understanding etiology, diagnosis, medical and surgical management of Appendicitis, Benign Prostatic Hypertrophy, and Sinusitis, ensuring comprehensive patient care.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	3	3	2	3	2	2	3	3
CO 3	3	3	2	3	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Type of Course	Credits
BVDT-505	Digital literacy and account literacy	General	4

Unit 1:

Review of MS office

Advance options in MS excel

Excel

Power point

Unit 2

Introduction to internet learning platform

Using internet-based learning platform

Using google and you tube for learning

Using smart phone to become smart

Benefits of digital learning

Unit 3

Using internet for personal requirement

Online payments method

Use of social media for advisement

Unit 4

Digital security and privacy

Various cybercrime and their safety guideline

Best practice for securing online and network transaction

Managing privacy and security and social media accounts

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Discover the educational resources available on Google and YouTube for self-directed learning and professional development.

CO 2. Understand the importance of MS Office & Excel.

CO 3. Use of Internet for personal needs, understanding online payment methods, and leveraging social media for effective advertising strategies.

CO4 understanding digital security and privacy, recognizing cybercrimes and implementing safety guidelines, applying best practices for online and network transaction security, and managing privacy and security in social media accounts.

Co	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
	CO 1	3	3	3	2	3	3	3	3	3
BVDT-506	CO 2	3	3	3	3	3	3	2	2	2
	CO 3	3	3	3	3	3	3	3	2	2
	CO 4	3	3	3	3	3	3	3	3	3

UNIT-1

1. Introduction to healthcare delivery system

- Healthcare delivery system in India at primary, secondary and tertiary care
- Community participation in healthcare delivery system
- Health system in developed countries.
- Private Sector
- National Health Mission
- National Health Policy
- Issues in Health Care Delivery System in India

UNIT-2

2. National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme.

UNIT-3

3. Introduction to AYUSH system of medicine

- a. Introduction to Ayurveda.
- b. Yoga and Naturopathy
- c. Unani
- d. Siddha
- e. Homeopathy
- f. Need for integration of various system of medicine

UNIT-4

4. Health scenario of India- past, present and future

Demography & Vital Statistics-

- a. Demography – its concept
 - b. Vital events of life & its impact on demography
 - c. Significance and recording of vital statistics
 - d. Census & its impact on health policy
6. Epidemiology
- a. Principles of Epidemiology
 - b. Natural History of disease
 - c. Methods of Epidemiological studies
 - d. Epidemiology of communicable & non-communicable diseases, disease transmission, host defense immunizing agents, cold chain, immunization, disease monitoring and surveillance.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding healthcare systems, community involvement, private sector roles, national health initiatives, policies, and challenges in Indian healthcare.

CO2 Understanding objectives, plans, targets, operations, achievements, and constraints across diverse National Health Programs comprehensively.

CO3 Understanding Ayurveda, Yoga, Naturopathy, Unani, Siddha, Homeopathy, and the necessity for integrating diverse systems of medicine.

CO4 Understanding demography, vital statistics, census impact, epidemiology principles, disease history, study methods, and disease transmission for comprehensive health analysis in India.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	2	2	3	3
CO 3	3	3	2	3	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Type of Course	Credits
BVDTP-501	Applied pharmacology related to dialysis Lab	Skill	2

- Use of IV fluid therapy with special emphasis in renal diseases.
- Anti-hypertensives drug
- Drugs & dialysisDialyzable drugs.
- Peritoneal dialysis

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Usefully manage IV fluid therapy, emphasizing renal disease treatment.

CO2 Understand anti-hypertensive drugs, their mechanisms, and therapeutic applications comprehensively.

CO3 Understand dialyzable drugs and their implications in peritoneal dialysis.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	2	3	3	2	2	3
CO 2	3	2	2	2	3	2	3	2	3
CO 3	3	2	2	2	2	3	3	2	3

Course Code	Course Name	Type of Course	Credits
BVDTP-502	Clinical dialysis-II Lab	Skill	2

Management of:

- Renal bone disease.
- Endocrine dysfunction in dialysis patients.
- Dialysis amyloidosis

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding etiology, diagnosis, management, and prevention of renal bone disease comprehensively.

CO2 Identifying, managing, and preventing endocrine dysfunctions in dialysis patients effectively.

CO3 Understanding the pathogenesis, clinical manifestations, diagnosis, management, and preventive measures of dialysis-related amyloidosis.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	3	2	3	3	2	2	3
CO 2	3	2	3	2	3	3	3	3	3
CO 3	3	2	3	2	2	3	3	2	3

Course Code	Course Name	Type of Course	Credits
BVDTP-503	Renal Nutrition Lab	Skill	2

- Management of fluid and electrolyte in CKD, HD, CAPD
- Nutritional management of HD patient.
- Nutritional management of CAPD patient.
- Nutritional management of renal transplant recipient.
- Nutritional management of AKI

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding management of fluid/electrolyte imbalances in CKD, HD, CAPD, and tailored nutritional strategies for HD patients.

CO2 Developing tailored nutritional plans to optimize health and well-being for CAPD patients effectively.

CO3 Understanding nutrition to support renal transplant recipients' health and addressing nutritional needs effectively during acute kidney injury.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	2	2	2	3	3
CO 2	3	2	3	3	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3

Course Code	Course Name	Type of Course	Credits
BVDTP-504	General medicine and general surgery Lab	Skill	2

Demonstration of:

- Heart failure
- Tuberculosis
- Pleura effusion
- Peritonitis
- prostate
- Sinusitis

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand heart failure management, tuberculosis diagnosis, treatment, and prevention.

CO2 Comprehend pleural effusion, peritonitis etiology, diagnosis, treatment, and management.

CO3 Understand prostate disorders and sinusitis: etiology, diagnosis, treatment, management.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3

CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3

Course Code	Course Name	Type of Course	Credits
BVCCTP-505	Digital Literacy and account literacy Lab	Skill	2

- Uses Advance options in MS excel
- Excel
- Power point
- Using internet-based learning platform
- Using google and you tube for learning
- Using smart phone to become smart
- Using internet for personal requirement
- Online payments method
- Use of social media for advisement

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Develop knowledge, skills, and competencies necessary to leverage advanced features in MS Excel and PowerPoint.

CO 2. Develop to navigate internet-based learning platforms effectively

CO 3. Develop to utilize Google and YouTube for learning purposes.

CO 4. Develop to harness the potential of smartphones for learning and productivity.

CO 5. Develop to manage online payments securely, and leverage social media for personal and professional advancement.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

BVOC (Dialysis Technology) VIth Sem

Course Code	Subject	Content Type	Credit
BVDT-601	Clinical Nephrology and dialysis management	General	4

UNIT-1

Various diagnostic procedure of renal diseases, Manifestation of renal diseases, Renal vascular disease, Glomerular disease, Tubulo-interstitial disease, Congenital abnormalities of kidneys.

UNIT-2

Renal involvement in systemic diseases.

Infectious conditions of Kidney & urinary tract Obstruction of urinary tract Effects of the drugs on the kidney.

Tumors of Kidney & urinary tract.

Hard water syndrome.

Water, fluid & electrolyte imbalance.

Unit-3

DIALYSIS MANAGEMENT

Semi permeable membrane, types, Selective diffusion dialysis, Artificial kidney & its use, Type of Dialysis, Dialyzers, Substituted membrane HAEMODIALYSIS, function of semi permeable membrane in hemodialysis

Waste product removed by hemodialysis transport

Rate of mass transfer-Solute flux. Diffusive transport & its importance, Clearance, Ultra filtration & hydrostatic gradient, TMP Water for Dialysis procedure

Unit-4

Filtration Decantation Distillation Softener, Deionizer Reverse osmosis, Different impurities. Role of charcoal, RO Plant. Water used in Dialysis Compare RO with DI.

DIFFERENT TYPES OF DIALYZER – Description, reuse, indication, care, Factors improving performance, Choosing Dialyzer, Priming Sterility, Washing Formalin-Use, hemofiltration, hemoperfusion

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding renal disease diagnostics, manifestations, including vascular, glomerular, tubulo-interstitial disorders, and congenital kidney abnormalities effectively.

CO2 Understand renal involvement in systemic diseases, infectious conditions, urinary tract obstruction, drug effects, tumors, hard water syndrome, and electrolyte imbalances comprehensively.

CO3 Understand dialysis management including membrane types, diffusion, artificial kidney, waste removal, solute flux, clearance, and water requirements.

CO4 Understand water treatment methods, impurities, charcoal, RO plants, dialyzer types, reuse, care, priming, sterilization, and dialysis variations comprehensively.

CO	Subject				Content		Credit		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
Course Code									
BVDT-602	Advance dialysis technology				Skill		4		

UNIT-1

CRRT

SLED

Plasmapheresis.

Hemoperfusion.

UNIT-2

Pediatric dialysis

Dialysis in elderly patient.

UNIT-3

Dialysis in critically ill patient.

Principle of rehabilitation, counselling and motivational strategies and role of dialysis technologist.

UNIT-4

Quality assurance and quality management in dialysis.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand CRRT, SLED, plasmapheresis, and hemoperfusion procedures effectively.

CO2 Understanding pediatric and geriatric dialysis nuances, including tailored care, considerations, and management strategies for optimal outcomes.

Bachelor Of Vocational Studies Program Outcomes (POs) for B.Voc

PO1	Disciplinary Knowledge: Demonstrate comprehensive knowledge of one or more disciplines that form a part of an undergraduate B.Voc programme Execute strong theoretical and practical understanding generated from the chosen B.Voc programme.
PO2	Critical Thinking and Problem solving: Exhibit the skill of critical design thinking and use them to predict a range of creative solutions towards a design problem, evaluate them and choose the most appropriate options.
PO3	Social Competence Exhibit thoughts and ideas effectively in writing and orally; communicate with others using appropriate media, build effective interactive and presenting skills to meet global competencies and connect to people individually or in group settings.
PO4	Research-Related Skills: Demonstrate a sense of inquiry and capability for asking relevant/appropriate questions; ability to plan, execute and report the results of an experiment Employ knowledge of the avenues for research and higher academic achievements in the chosen field and allied subjects and aware about research ethics, intellectual property rights and issues of plagiarism.
PO5	Personal and Professional competence: Perform independently and participates in team activities and demonstrates cooperation. Integrate enthusiasm and commitment to improve personal and team performance levels and build skills to achieve the goals.
PO6	Effective Citizenship and Ethics : Demonstrate empathetic social concern and equity centred national development; ability to act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.
PO7	Environment and Sustainability: Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.
PO8	Self-directed and Life-long learning: Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.
PO9	Trans-disciplinary Research competence: Create new conceptual, theoretical, methodological innovations that integrate and transcend beyond discipline-specific approaches to address a common problem.

BVOC (Hospital Sterilization) 1st Sem

Course Code	Course Name	Content Type	Credit
BVHS -101	Basics of Human Anatomy & Physiology-I	Gen	4

Unit -1

anatomical Position



Facing the observer, head level, eyes facing forward.



This is what the image in the book looks like



Prone: facing face down, Supine: facing face up



Superior: upper part of the body



Inferior: lower part of the body



Anterior: near to or at the front



Posterior: near to or the back of the body



Medial: midline (think of the body being divided into 2)



Lateral: far from midline (away from the center)



Intermediate: between 2 structures



Ipsilateral: same side of the body as another structure



Contralateral: on the opposite side of another structure



Proximal: close to where the structure originates. Near to the attachment of a limb



Distal: away from the attachment of a limb to the trunk



Superficial: toward or on the surface of the body



Deep (internal): away from surface of the body

Terminology and General Plan of the Body, Body Parts and Areas, Terms of Location and Position, Body Cavities and Their Membranes, Dorsal cavity, Ventral cavity, Planes and Sections, Cells: Structure, function and location, Prokaryotic and eukaryotic cells, Cell organelles, Cell division.

UNIT-2

Tissue, Types, Structure, Location and Function of Epithelial Tissue, Connective Tissue, Muscle Tissue, Nerve Tissue, Membranes, Glandular tissue The Integumentary System: structure and function of The Skin, Subcutaneous Tissue, Musculoskeletal System: Basic anatomy of important muscles and bones.

UNIT-3

Cell physiology: Structure, membrane, transport across cell membrane, Active, Passive, Organization of the Body, Body Composition, Body Fluid Volumes and its measurement, Diffusion, Osmosis, Tonicity, Homeostasis

UNIT-4

Blood-composition, function, cellular component & their function, haemoglobin & anaemia, blood groups and coagulation

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Explain the gross morphology, structure and functions of various organs of the human body.

CO 2. Describe the various homeostatic mechanisms and their imbalances.

CO 3. Identify the various tissues and organs of different systems of human body.

CO 4. Demonstrate the various experiments related to special senses and nervous system.

CO 5. Evaluate coordinated working pattern of different organs of each system.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	3	3	3	2	2	3
CO 5	3	3	3	3	2	3	2	3	3

Course Code	Course Name	Content Type	Credit
BVHS -102	Basic Concepts of CSSD Technology-1	Skill	4

- UNIT-1 Introduction to CSSD
 - History and development of CSSD
 - Philosophy of CSSD
 - Functions of CSSD -Location ,Physical layout
- UNIT-2 Central Service Workflow
 - Decontamination
 - Preparation
 - Packaging
 - Instrument Assembly Process
 - Basic Job –Knowledge and Skill
- UNIT-3 Zoning
 - Zoning: CSSD & Theatre
 - Protected zone
 - Clean zone
 - Sterile zone
 - Maintaining a sterile field : Factors affecting sterile field
 - Personal hygiene standards

- UNIT-4 Asepsis
 - Concepts
 - Medical and surgical asepsis, barrier methods
 - Hand washing techniques: Medical and surgical
 - Personal protective equipment: types, uses, techniques of wearing & removal

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the historical development of Central Sterile Supply Department (CSSD) and its evolution over time.

CO 2. Describe the sequential workflow of decontamination, preparation, packaging, and instrument assembly processes in CSSD.

CO 3. Demonstrate practical knowledge and skills required for each step of the CSSD workflow.

CO 4. Demonstrate personal hygiene standards essential for maintaining aseptic environments in CSSD.

CO 5. E Identify different types of personal protective equipment (PPE), their uses, and demonstrate correct techniques for wearing and removing them to maintain aseptic conditions.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3
CO 5	3	3	3	2	3	3	2	3	2

Course Code	Course Name	Content Type	Credit
BVHS -103	Fundamentals of Microbiology	Gen	4

UNIT-1

Introductory microbiology: Introduction to and brief of microbiology, scope and relevance of microbiology, modern developments in microbiology, explain the types and methods of sterilization, use and types of microscopes; bright microscope, field microscopy, dark field microscopy, phase contrast microscopy, electron microscopy.

UNIT-2

Morphology and structure of microorganisms: Morphology and structure of bacteria, fungi, actinomycete and algae etc., microscopic examination of microorganisms, preparation of culture media, spread plates, pour plates, types of selective and differential media, separation of pure cultures, principles and uses of microbiology equipment's and instruments.

UNIT-3

Stains used in microbiology: Introduction to stains; importance of stain in microbiology; types of stains in detailed giving example-simple stain differential stain, negative stain, impregnation method; special staining for certain bacteria, bacterial spores, parasites and fungi; principle, procedure, application and result, interpretation of gram staining and ziehl neelsen staining.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To develop a foundational understanding of microbiology, including its scope, relevance in various fields, and recent advancements in the field.

CO 2. To understand the principles and uses of microbiology equipment and instruments.

CO 3. Able to provide students with a solid foundation in introductory microbiology concepts, laboratory techniques, and microscopy, enabling them to understand, visualize, and analyze microorganisms effectively in various scientific and clinical settings.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3

Course Code	Course Name	Content Type	Credit
BVHS -104	Reporting and documentation in CSSD	Skill	3

- UNIT -1 Scope of practice for CSSD Technician
 - Reporting matrix -methods
 - Importance of maintaining various records
 - Obtaining them from related resources .
- UNIT-2 Records to be maintained by CSSD Technician
 - Essential components of various records and method of documentation and their retrieval
 - Legal implications of electronic medical Records/Electronic Health Records
 - Documentation and maintain proper registers related to CSSD function

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Develop skills in obtaining necessary records from related resources such as inventory systems, sterilization equipment logs, and quality assurance documentation.

CO 2. Demonstrate proficiency in documenting CSSD activities and maintaining proper registers according to established protocols and standards.

CO 3. Develop competence in the documentation and retrieval methods of CSSD-related records, ensuring accuracy, completeness, and accessibility for audit purposes and quality improvement initiatives.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	2	2	3	2	2
CO 2	3	2	2	2	2	2	3	2	3
CO 3	3	2	2	3	2	3	3	2	3

Course Code	Course Name	Content Type	Credit
BVHS-105	Fundamental of Computers	Gen	3

Unit-1

Introduction to Computers, History of Computer, Generations, Characteristics, Advantages and limitations of Computer, Classification of Computers, Functional Components of Computer, input, Output and Processing, Concept of Hardware and Software, Data & Information. Concept of data storage. Number system. Decimal, Binary, Hexadecimal ASCII.

UNIT-2

Introduction to GUI Based Operating System Basics of Operating system, Basics of DOS & LINUX, The User interface, File and directory management, Windows setting, Control Panel, devices and Printer setting, Using various window commands for desktop.

UNIT-3

Word Processing, Word processing basics, Menu Bar, Opening and closing documents, save & save as, Page setup, print preview, and printing. Text creation and manipulation Editing, cut copy paste. Document creation, editing, Formatting the text – Paragraph indenting, bullets and numbering, changing case, Table manipulation – creation of table, insertion and deletion of cell, row and column.

UNIT-4

Network basics, Internet Basics of computer network LAN, WAN etc, Concept of Internet, Basic of Internet Architecture, Services on Internet Architecture, World wide web and websites, Communication on Internet, Internet Services, Preparing Computer for Internet Access, ISPs and Examples, Internet Access Technologies. Web Browsing, configuring web browser, Popular search engines Downloading and printing web pages. Internet application Basics of E-mail, E-mail addressing, forwarding and searching, Composing.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Identify the functional components of a computer system, including input devices, output devices, and central processing units.

CO 2. Apply knowledge of operating system basics to troubleshoot common issues and optimize system performance.

CO 3. Demonstrate proficiency in creating and manipulating text, including editing, cutting, copying, and pasting.

CO 4. Demonstrate proficiency in communication on the Internet, including sending and receiving emails and using messaging services.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	2	2	3	2	2
CO 2	3	2	2	2	2	2	3	2	3
CO 3	3	2	2	3	2	3	3	2	3
CO 4	3	2	2	2	2	3	2	2	3

Course Code	Course Name	Content Type	Credit
BVHS-106	General English & Soft Skill	Gen	2

Unit-1 Introduction to English language

- Role and significance of English language in the present scenario
- English language: its relevance for the Indian industry.
- Introduction to listening, speaking, reading, writing and bench marking of the class.

Unit 2: Grammar and usage

Verbs
 Determiners
 Active Voice and Passive Voice
 Tenses

Unit 3:

Letter writing & Notice Writing

Unit 4:

Précis and Report writing

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Recognize the relevance of English language proficiency for the Indian industry, particularly in sectors such as information technology, business process outsourcing, and international trade.

CO 2. Demonstrate proficiency in using different grammatical structures, including sentence types, verb forms, and agreement.

CO 3. Apply knowledge and skills acquired in letter and notice writing to real-world scenarios, such as job applications, invitations, or announcements.

CO 4. Apply précis and report writing skills in academic, professional, and organizational settings to communicate information effectively and persuasively.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	3	3	3	2	2	3
CO 5	3	3	3	3	2	3	2	3	3

Course Code	Course Name	Content Type	Credit
BVHSP-101	Basics of Human Anatomy & Physiology-I Lab	Skill	2

Human anatomy (practical)

Demonstration of

- Study of Human Skeleton parts with skeletal models.
- Study with charts and models of all organ systems mentioned above.
- Microscopic slides examination of elementary human tissues, cells.
- Major organs through models and permanent slides.
- Parts of circulatory system from models.
- Parts of respiratory system from models.
- Digestive system from models.

Excretory system from models.

Human Physiology (Practical)

- To measure pulse rate
- To measure blood pressure
- To measure temperature
- Measurement of the Vital capacity
- Determination of blood groups
- Transport of food through esophagus
- Calculation and evaluation of daily energy and nutrient intake.
- Measurement of basal metabolic rate
- Demonstration of ECG
- Bile juice secretion and excretion

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Develop proficiency in using laboratory equipment and techniques for anatomical and physiological experiments, such as microscopy, physiological measurements, and data analysis.

CO 2. To understand the relationship between anatomical structures and their functions in the human body.

CO 3. Develop critical thinking and problem-solving skills through the design and execution of laboratory experiments.

CO 4. Develop practical experience in identifying anatomical structures of the Human Body.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	2	2	3	2	2
CO 2	3	2	2	2	2	2	3	2	3
CO 3	3	2	2	3	2	3	3	2	3
CO 4	3	2	2	2	2	3	2	2	3

Course Code	Course Name	Content Type	Credit
BVHSP-102	Basic Concepts of CSSD Technology-1 Lab	Skill	2

- Zoning: CSSD & Theatre, Protected zone, Clean zone, Sterile zone
- Maintaining a sterile field : Factors affecting sterile field, Personal hygiene standards
- Asepsis: concepts, medical and surgical asepsis,
- Barrier methods
- Hand washing techniques: Medical and surgical Personal protective equipment: types, uses, techniques of wearing & removal
- Infection control -Infection control, Nosocomial infections (HAI)
- Most frequent sites of infection, Strategies for infection control
- Standard precautions
- Transmission based precautions
- Hospital infection control program (SOP, Protocols)

- Hospital infection committee
- Management of sharps
- Needle stick injury management
- Management of blood and body fluid spillage, Clean environmental surfaces

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate knowledge of procedures and protocols for maintaining each zone's cleanliness and sterility.

CO 2. Identify factors that affect the sterility of a field in healthcare environments.

CO 3. Describe the components of a hospital infection control program, including standard operating procedures (SOPs) and protocols.

CO 4. Understand the principles of infection control and the significance of preventing nosocomial infections (HAI).

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Content Type	Credit
BVHSP-103	Fundamentals of Microbiology Lab	Skill	2

- Use of microscope in examination of unstained bacteria, fungi, algae, parasites and stained cell preparations including simple staining, Gram's staining, acid fast staining, capsule staining, spore staining using
- prokaryotic and eukaryotic cells, hanging drop preparation.
- Preparation of culture media, spread plates, pour plates,
- selective media, differential media.
- Separation of pure cultures and study the effect of selective nutrients on prokaryotes
- Isolation of Soil Bacteria, Soil Fungi, Soil Actinomycets
- Selective media for Soil microflora and use of growth factors, Study of Rhizosphere interactions, Quantitative measurements of Soil nutrients and Rhizosphere microflora and preparation of starter cultures of Rhizobia, Azotobacter.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To develop proficiency in using light microscopes for the examination of unstained bacteria, fungi, algae, parasites, and stained cell preparations.

CO 2. To develop proficiency in quantitative methods for measuring soil nutrients and assessing the composition of rhizosphere microflora.

CO 3. Classify various staining techniques including simple staining, Gram's staining, acid-fast staining, capsule staining, and spore staining to differentiate between different types of

microorganisms.

CO 4. To equip students with practical skills and theoretical knowledge necessary for conducting microbiological studies, particularly in the context of environmental microbiology, soil microbiology, and plant-microbe interactions.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	2	2	3	1	1
CO 2	2	2	2	1	1	2	3	2	3
CO 3	3	2	1	3	2	3	3	2	3
CO 4	3	2	1	2	2	3	2	2	3

Course Code	Course Name	Content Type	Credit
BVHSP-104	Reporting and documentation in CSSD Lab	Skill	2

- Define the scope of practice for CSSD Technician
- Define reporting matrix and discuss the methods.
- Understand importance of maintaining various records & how to obtain them from related resources
- Explain various types of records to be maintained by CSSD Technician
- Demonstrate essential components of various records and method of documentation and their retrieval
- Understand the legal implications of electronic medical Records/Electronic Health Records
- Develop skill in documentation and maintain proper registers related to CSSD function

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand importance of maintaining various records & how to obtain them from related resources

CO 2. Demonstrate essential components of various records and method of documentation and their retrieval

CO 3. Understand the legal implications of electronic medical Records/Electronic Health Records

CO 4. Develop skill in documentation and maintain proper registers related to CSSD function

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	3	3	3	2	2	3

Course Code	Course Name	Content Type	Credit
BVCCTP-105	Fundamentals of computer Lab	Skill	2

- Starting MS WORD, Creating and formatting a document,
- Changing fonts and point size,
- Table Creation and operations, Autocorrect, Auto text, spell Check, Word Art, Inserting
- Objects, Page setup, Page Preview, Printing a document, Mail Merge.
- Starting Excel, Work sheet, cell inserting Data into Rows/ Columns, Alignment, Text wrapping , Sorting data, Auto Sum, Use of functions, referencing formula cells in other
- formulae , Naming cells, Generalisation graphs, Worksheet data and charts with WORD, Creating
- Hyperlink to a WORD document, Page set up, Print Preview, Printing Worksheets.
- Starting MS–Power Point,, Creating a presentation using auto content Wizard, Blank presentation, creating, saving and printing a presentation, Adding a slide to presentation,
- Navigating through a presentation, slide sorter, slide show, editing slides, Using Clipart, Word
- Art gallery, Adding Transition and Animation effects, setting timings for slide show, preparing
- Note pages, preparing audience hand-outs, printing presentation documents, MS-Access,
- Creating tables and database, Internet, Use of Internet (Mailing, Browsing, and Surfing).

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate proficiency in using Microsoft Office applications including Word, Excel, PowerPoint, and Access.

CO 2. To understand best practices for organizing files, managing projects, and optimizing workflow using Microsoft Office tools to enhance professionalism and productivity.

CO 3. Apply knowledge of basics of MS Office and its application to troubleshoot common issues.

CO 4. Demonstrate proficiency in effective Utilization of Internet Tools.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

BVOC (Hospital Sterilization) IInd Sem

Course Code	Course Name	Type of Course	Credits
BVHS-201	Human Anatomy & Physiology –II	Gen	4

UNIT-1

Cardiovascular system: Basic anatomy of heart and important blood vessels Brief introduction about Lymphatic System, The Nervous System: Basic anatomy of brain and spinal cord, meninges and cerebrospinal fluid, Cranial, Endocrine System: Brief anatomy of Pituitary, Thyroid, Parathyroid, Pancreas, Adrenal, Special Senses: Basic anatomy of eye, ear and nose

UNIT-2

Genitourinary system: Basic anatomy of kidney and associated organs, male reproductive organs, female reproductive organs, Respiratory system: Basic anatomy of nose, larynx, trachea, bronchi and lung, Digestive system: basic anatomy of esophagus, stomach, small intestine, large intestine, liver, gall bladder, pancreas

UNIT-3

Cardiovascular system-general arrange, heart, arteries, veins and capillaries, heart structure and function, cardiac cycle, heart sounds, heart rate, blood pressure, mechanism of circulation, definition of hypertension & shock ,Respiratory system: parts of respiratory system, mechanism of respiration, pulmonary function, pulmonary circulation, lungs volume, Gas transport between lungs and tissues, Definition of hypoxia, dyspnoea, cyanosis, asphyxia and obstructive airways diseases Unit, Gastrointestinal physiology: Organs of GIT and their structure & function, secretion, digestion, absorption and assimilation, gastrointestinal hormones, physiology of digestion of carbohydrates, proteins & lipids, Structure & function of liver, spleen, gall bladder & pancreas, Jaundice, Cirrhosis & Pancreatitis.

UNIT-4

Excretory System: Kidneys, Nephron, Mechanism of Excretion, Urine formation (Glomerular filtration and Tubular reabsorption) , Electrolytes: their balances and imbalances Introduction of acidosis and alkalosis , Muscle nerve physiology, types of muscles, their gross structural and functional difference with reference to properties ,Nervous system- general organization of CNS, function of important structure and spinal cord, neuron, nerve impulse, type of nerves according to function, Autonomic nervous system organization & function Special senses-general organization & functions, Endocrine System: Brief introduction about endocrine glands and their secretion, common endocrinological disorder such as diabetes mellitus, hyper & hypothyroidism, dwarfism, gigantism, tetany. Reproductive System: male & female reproductive organs, sex hormones, secondary sexual characteristics, puberty, spermatogenesis, oogenesis, menstrual cycle, pregnancy, menopause, contraceptive measures.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand the Anatomy and Physiology of the cardiovascular system, including the structure and function of the heart, major blood vessels, and associated organs.

CO 2. Identify the physiology of the gastrointestinal system, including secretion, digestion, absorption, and assimilation of nutrients.

CO 3. To understand the Anatomy and Physiology, covering various organ systems and their functions in the human body.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3

CO 3	3	3	3	3	3	3	3	2	3
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Course Code	Course Name	Type of Course	Credits
BVHS-202	Introduction to Hospital Policies and Procedures	Skill	3

- UNIT -1 Hospital
 - Organization
 - Functions and Types of Hospital
 - Policies and procedures
 - Various hospital departments
 - Structure and physical set up of hospital.
- Unit 2
 - Admission, Admission Procedures, Steps, Types
 - Discharge ,Discharge Procedure, Types .

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the organization of hospitals, including their structure, governance, and administrative hierarchy.

CO 2. Describe different types of hospitals such as community hospitals, teaching hospitals, specialty hospitals, and tertiary care centers.

CO 3. Describe the admission process in hospitals, including the steps involved and different types of admissions such as elective, emergency, and outpatient admissions.

CO 4. Recognize the importance of effective communication and coordination among healthcare professionals during the admission and discharge processes to ensure seamless transitions of care for patients.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	3	3	3	2	2	3

Course Code	Course Name	Type of Course	Credits
BVHS -203	Infection control in CSSD	Skill	3

- UNIT -1 Central Service Processes
 - Cause of concern
 - Protection from pathogens
 - Principal of Asepsis
 - Personal Hygiene and Attire
 - Techniques of self grooming and maintenance.
- UNIT-2 Hand Hygiene
 - Infection Control/Exposure Control/ PPE
 - Elements of transmission and chain of infection - Causative agent, Reservoir/ Source, Portal of exit, Susceptible Host
 - Managing the environment to manage the spread of bacteria
 - Techniques of use of PPE

- UNIT 3 Occupational Safety and Health Administration
 - Environmental concerns in central service areas – Physical Design, Work Area Cleanliness
 - Other Environmental Cleanliness Requirements.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Identify the causes of concern in central service processes, including contamination and infection risks.

CO 2. Demonstrate knowledge of personal hygiene practices and appropriate attire for central service personnel.

CO 3. Demonstrate proper hand hygiene techniques to prevent the transmission of pathogens..

CO 4. Understand the role of OSHA regulations in ensuring occupational safety and health in central service areas.

CO 5. Implement knowledge and skills to maintain a safe and hygienic environment in central service areas, minimize infection risks, and comply with regulatory standards and best practices in healthcare settings.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	3	3	3	2	2	3
CO 5	3	3	3	3	2	3	2	3	3

Course Code	Course Name	Type of Course	Credits
BVHS-204	Medical Terminology	Gen	4

- Unit 1 Importance of Medical Terminology
 - The health care profession
 - Understanding the Operating Room
 - Providing Quality of service to the patient
 - Medical Terminologies relevant to CSSD
- Unit 2 Anatomy of a Medical Term
 - Medical Terminologies from Minimally invasive surgeries to open procedures
 - Equipment and Medicines in Crash cart
 - Equipment in Instrument trays.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand the significance of medical terminology in the healthcare profession.

CO 2. Develop proficiency in medical terminology relevant to Central Sterile Supply Department (CSSD) operations.

CO 3. Understand the types of equipment typically included in instrument trays for surgical procedures.

CO 4. Develop proficiency in interpreting and utilizing medical terminology in the context of CSSD operations and patient care.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Type of Course	Credits
BVHS -205	OT Instrumentation	Skill	3

- Unit 1: Surgical Instruments
 - Important role of instrument selection and inspection
 - Instrument Management Process
 - Classification and over view of surgical instruments:
 - Hemostatic Forceps
 - Needle Holders
 - Tissue Forceps
 - Dressing Forceps
 - Retractors, Scissors
 - Suction Devices
 - Single and Double Action Ronguers
 - Kerrison / Laminectomy Ronguers
 - Nail Nippers
 - Graves Vaginal Speculum
- Unit 2 : Complex Surgical Instruments
 - Power Surgical Instruments
 - Endoscopes – Flexible, Rigid, Semi-rigid
 - Endoscopic and Robotic Instrumentation
 - Endoscope regulations and guidelines
 - Care and handling
 - Endoscope Camera Care and Handling
 - Endoscope Repair
 - Staff Education
- Unit 3 : Instrument Management
 - Preliminary Checking
 - Post Operative Care of Instruments
 - Solutions that damage instruments
 - Instruments sharpness testing and identification
 - Instrument identification Methods
 - Instrument Lubrication
 - Loaner Instrumentation.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate proficiency in the instrument management process, including sterilization, storage, and handling.

CO 2. Understand the different types of endoscopes (flexible, rigid, semi-rigid) and their respective uses.

CO 3. Understand the surgical instruments, including their selection, handling, maintenance, and management, contributing to safe and effective surgical practices in healthcare settings.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3

Course Code	Course Name	Type of Course	Credits
BVHS -206	Basics of Health Market & Economy	Gen	3

Unit I

Health Care Market An Introduction : Main Problems in the Market for Health Care, Health Care and Economic Basics, Analyzing Health Care Markets. Demand-Side Considerations: Demand for Health and Health Care, Market for Health Insurance

Unit II

Supply-Side Considerations: Managed Care, Health Care Professionals, Hospital Services, Confounding Factors Public Policy in Medical Care: Policies to Enhance Access, Policies to Contain Costs, Medical Care Systems Worldwide,

UNIT-III

Health Sector in India: An Overview Health Outcomes; Health Systems; Health Financing Evaluation of Health Programs Costing, Cost Effectiveness and Cost-Benefit Analysis; Burden of Diseases ,Role of WHO , Health Care Budget: purpose, types & practices in Indian context.

UNIT-IV

Health Economics: Fundamentals of Economics: Scope & coverage of Health Economics, demand for Health Sciences; Health as an investment, population, Health & Economic Development. Tools of Economics-Concepts of need, demand, supply & price in Health Services. Methods & Techniques of Economic Evaluation of Health Programmes: Cost benefit & cost effective methods-output & input analysis.

Market, monopoly, perfect & imperfect competition. Health Financing from various sources – Public , Private, TPA. Economics of Health Programmes for Nutrition, diet & population control, economics of abuse of tobacco & alcohol, environmental influences on health and feeding. Economics of Communicable (STDs & Malaria) & non-communicable (IHD & Cancers) diseases.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To Understand and analysis of Health Care Market Dynamics

CO 2. To understand economic concepts such as need, demand, supply, and price in health services, as well as methods and techniques for economic evaluation of health programs, including cost-benefit and cost-effectiveness analysis.

CO 3. Able to provide students with a comprehensive understanding of health care markets, policies, and economics, enabling them to analyze and evaluate health care systems, policies, and programs effectively, and make informed decisions in health care management and policy development.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3

CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3

Course Code	Course Name	Type of Course	Credits
BVHSP-201	Human Anatomy & Physiology –II Lab	Skill	2

Human Anatomy-II (Practical)

Demonstration of:

- Nervous system from models.
- Structure of eye and ear
- Structural differences between skeletal, smooth and cardiac muscles.
- Various bones
- Various joints
 - Various parts of male & female reproductive system from models

Human Physiology- II (Practical)

- To perform total platelet count.
- To perform bleeding time.
- To perform clotting time.
- To study about CSF examination.
- To study about intrauterine contraceptive devices.
- To demonstrate microscopic structure of bones with permanent slides.
- To demonstrate microscopic structure of muscles with permanent

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the structure and function of the central nervous system (brain and spinal cord) and the peripheral nervous system.

CO 2. Identify the different parts of the eye and ear and their functions.

CO 3. Interpret the results of the clotting time test.

CO 4. understand the structure and function of the human body systems and perform various laboratory tests and examinations.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Type of Course	Credits
BVHSP-202	Introduction to Hospital Policies and	Skill	2

- Hospital : Organization, Functions, Types
- Policies and procedures , Various hospital departments
- Structure and physical set up of hospital.
- Admission, Admission Procedures, Steps, Types
- Discharge ,Discharge Procedure, Types.

Course Outcomes:

Upon completion of this course the student will be able to:

- CO 1.** Identify the roles and responsibilities of different personnel within a hospital setting.
- CO 2.** Understand the process of developing, implementing, and updating hospital policies and procedures.
- CO 3.** Identify and describe the different departments within a hospital, including clinical departments (e.g., surgery, medicine, pediatrics) and non-clinical departments (e.g., administration, finance, human resources).
- CO 4.** Explain the roles of healthcare professionals involved in the admission process, including nurses, physicians, and administrative staff.
- CO 5.** Understand the hospital organization, functions, policies, and procedures, enabling them to effectively contribute to the delivery of quality patient care and services within a healthcare setting.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3
CO 5	3	3	2	3	3	2	3	2	3

Course Code	Course Name	Type of Course	Credits
BVHSP-203	Infection control in CSSD Lab	Skill	2

- Central Service Processes-Cause of concern
- Protection from pathogens
- Principal of Asepsis
- Personal Hygiene and Attire
- Techniques of self-grooming and maintenance,
- Hand Hygiene: Infection Control/Exposure Control/ PPE
- Elements of transmission and chain of infection - Causative agent, Reservoir/ Source, Portal of exit, Susceptible Host, Managing the environment to manage the spread of bacteria
- Techniques of use of PPE
- Occupational Safety and Health Administration
- Environmental concerns in central service areas – Physical Design, Work Area Cleanliness, Other Environmental Cleanliness Requirements.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Identify potential causes of concern in central service processes, such as contamination, improper sterilization, and equipment malfunction.

CO 2. Describe the various pathogens that can pose a risk in central service areas, including bacteria, viruses and fungi

CO 3. Demonstrate proficiency in maintaining aseptic conditions during central service processes, such as instrument handling, packaging, and sterilization.

CO4. Understand the importance of maintaining a clean and organized work environment to prevent contamination and ensure patient safety.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3

Course Code	Course Name	Type of Course	Credits
BVHSP-204	Medical Terminology Lab	Skill	2

- Importance of Medical Terminology - The health care profession
- Understanding the Operating Room
- Providing Quality of service to the patient
- Medical Terminologies relevant to CSSD
- Anatomy of a Medical Term
- Medical Terminologies from Minimally invasive surgeries to open procedures
- Equipment and Medicines in Crash cart, Equipment's in Instrument trays.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the role of medical terminology in promoting accurate and effective communication among healthcare professionals.

CO 2. Understand the importance of providing high-quality patient care in healthcare settings, including the OR and Central Sterile Supply Department (CSSD).

CO 3. Apply knowledge of medical terminology anatomy to understand and memorize medical terms more effectively.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3

Course Code	Course Name	Type of Course	Credits
BVHSP-205	OT Instrumentation Lab	Skill	2

- Important role of instrument selection and inspection
- Instrument Management Process
- Classification And over view of surgical instruments- Hemostatic Forceps, Needle Holders, Tissue Forceps, Dressing Forceps, Retractors, Scissors, Suction Devices, Single and Double Action Ronguers, Kerrison / Laminectomy Ronguers, Nail Nippers, Graves Vaginal Speculum
- Power Surgical Instruments
- Endoscopes – Flexible, Rigid, Semi-rigid, Endoscopic and Robotic Instrumentation
- Endoscope regulations and guidelines, Care and handling
- Endoscope Camera Care and Handling
- Endoscope Repair
- Staff Education.
- Preliminary Checking
- Post-Operative Care of Instruments
- Solutions that damage instruments
- Instruments sharpness testing and identification
- Instrument identification Methods, Instrument Lubrication
- Loaner Instrumentation

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Classify and grasp an array of surgical instruments, from hemostatic forceps to endoscopes, including power surgical instruments.

CO 2. Develop educational programs and resources to enhance staff competency in instrument handling, care, and maintenance.

CO 3. Demonstrate proficiency in handling and connecting endoscope cameras to ensure optimal performance during procedures.

CO 4. Demonstrate knowledge and skills in surgical instrument management, ensuring the delivery of safe and effective surgical care to patients.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	2	2	3	1	1
CO 2	2	2	2	1	1	2	3	2	3
CO 3	3	2	1	3	2	3	3	2	3
CO 4	3	2	1	2	2	3	2	2	3

BVOC (Hospital Sterilization) IIIrd Sem

Course Code	Course Name	Type of Course	Credits
BVHS-301	Sterilization Techniques -1	Skill	4

- Unit 1 High Temperature Sterilization
 - Factors that impact sterilization
 - Anatomy of steam sterilizer, Types, Steam Sterilizer Cycles, Advantages.
- Unit 2 Basic work practices
 - Preparing Devices and packs for sterilization, Loading a sterilizer
 - Controlling wet packs, Extended sterilization cycles
 - Sterilization Quality Control
- Unit 3 Sterilization equipment functions

- Guidelines & policies
- Preparation of sterilization equipment
- Operating system of sterilizer
- Unloading & releasing sterilized loads
- HSE procedures
- Quality management requirements compilation.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand the factors influencing sterilization processes, including time, temperature, and pressure.

CO 2. Prepare devices and packs for sterilization according to established protocols.

CO 3. Prepare sterilization equipment for use, ensuring cleanliness and proper functioning.

CO 4. Implement effectively to sterilization processes in healthcare settings, ensuring the safety and quality of medical devices and equipment used in patient care.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	1	2	2	3	1	1
CO 2	2	2	2	1	1	2	3	2	3
CO 3	3	2	1	3	2	3	3	2	3
CO 4	3	2	1	2	2	3	2	2	3

Course Code	Course Name	Type of Course	Credits
BVHS-302	Regulations and Standards in CSSD	Skill	3

- Unit 1 Regulatory Agencies – US Food and Drug Administration
 - Centre for Disease Control and Prevention
 - US Department of Transportation
 - US Environmental Protection Agency
 - Occupational Safety and Health Administration
 - Centres for Medicare and Medicaid Services
 - State Regulatory Agencies.
- Unit 2 Professional Associations
 - Association for Advancement of Medical Instrumentation
 - American National Standards Institute
 - International Standard Organizations
 - The Joint Commission
 - National Fire Protection Association

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the roles and responsibilities of key regulatory agencies in healthcare, including the US Food and Drug Administration (FDA), Centers for Disease Control and Prevention (CDC), US Department of Transportation (DOT), US Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Centers for Medicare and Medicaid Services (CMS), and State Regulatory Agencies.

CO 2. Demonstrate knowledge of regulatory requirements related to medical devices, infection control, transportation of hazardous materials, environmental regulations,

workplace safety, healthcare reimbursement, and state-specific regulations.

CO 3. Recognize the roles and functions of prominent professional associations in the healthcare industry, including the Association for the Advancement of Medical Instrumentation (AAMI), American National Standards Institute (ANSI), International Organization for Standardization (ISO), The Joint Commission (TJC), and National Fire Protection Association (NFPA).

CO 4. Understand the mission, goals, and activities of these associations in establishing industry standards, promoting best practices, and advocating for the advancement of healthcare technology, safety, and quality.

CO 5. To understand the guidelines set forth by regulatory agencies and professional associations to ensure patient safety, quality of care, and organizational excellence.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3
CO 5	3	3	3	2	3	3	2	3	2

Course Code	Course Name	Type of Course	Credits
BVHS-303	Monitoring in CSSD	Gen	4

- Unit-1 General Monitoring
 - Decontamination Area Monitoring – Water Quality
 - Mechanical Cleaning Equipment.
- Unit 2 High Level Disinfection Monitoring
 - Chemical Disinfection Monitoring
 - Manual Disinfection
 - Automated Endoscope
 - Repressor Monitoring.
- Unit 3 Sterilization Monitoring
 - Process Indicators
 - Physical Monitoring
 - Biological Indicators
 - Process Challenge devices, Implants
- Unit 4 Sterilizer Specific Monitoring
 - Dynamic Air Removal Sterilizers
 - Gravity Sterilizers
 - Immediate use steam sterilizers
 - Multiple cycle testing
 - Tabletop Steam Sterilizers
 - Hydrogen Peroxide Sterilizers.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the importance of monitoring in the decontamination area, particularly in assessing water quality and the performance of mechanical cleaning equipment.

CO 2. Recognize the various methods and techniques for monitoring high-level disinfection processes, including chemical disinfection, manual disinfection, and automated endoscope reprocessor monitoring.

CO 3. Understand the different types of monitoring tools and indicators used in sterilization processes, including process indicators, physical monitoring devices, biological indicators, and process challenge devices.

CO 4. Understand the unique features, requirements, and challenges associated with each type of sterilizer, and implement appropriate monitoring protocols accordingly.

CO 5. Assess and monitor decontamination, disinfection, and sterilization processes in healthcare facilities, ensuring the safety and efficacy of medical devices and equipment used in patient care.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	2	3	3	3
CO 5	3	3	3	2	3	3	2	3	2

Course Code	Course Name	Type of Course	Credits
BVHS-304	CSSD Technology I	Skill	3

- Unit 1 Decontamination of work area
 - Design and location of the decontamination area
 - Dress code and personal behaviours
 - Work Setup, Cleaning Tools
 - Steps in the process of decontamination
 - Cleaning methodologies
- Unit 2 Disinfection
 - Introduction to disinfectants
 - Types of disinfectants
 - Safe work practices when performing manual disinfection
 - Quality assurance for disinfection
- Unit 3 Assembly and Packaging
 - The physical environment
 - Dress code and behaviour
 - Pack Preparation - Goals, Guidelines, Procedures
 - Disposable Packing Materials
 - Wrapping Techniques
 - Methods of Pack Closure, Pack Labelling, Special Packing Concerns.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate proficiency in setting up work areas for decontamination and utilize appropriate cleaning tools and methodologies.

CO 2. Implement quality assurance measures to ensure the effectiveness of disinfection processes, including regular monitoring and validation of disinfectant concentrations and contact times.

CO 3. Understand the importance of the physical environment in the assembly and packaging area and adhere to dress code and behavior guidelines to maintain cleanliness and sterility.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
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CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHS-305	Advance Computing Skills	Gen	2

Unit-1

Advance Word Processing Tools, Setting the layout of Table and documents, Mail merge techniques. Letter envelopes etc, Using spell check and Thesaurus, Foot note and Endnotes, Using Charts , shapes and pictures in word .

Unit-2

Basics of Spreadsheet, Functions of Spreadsheet , Applications , Elements of Electronic Spread sheet ,creating document saving and printing the worksheet, manipulation of cells ,Functions and charts, using formulas , Functions and charts

UNIT-3

Advance Spreadsheet Tools, Manipulations with charts and its types, Sorting, Filtering of data ,Pivot table, data validation techniques. Grouping and subtotaling of data. Text to column option . Printing of customized worksheet.

UNIT-4

Presentation Software, Using Powerpoint, Opening an powerpoint presentation, Saving a presentation , Entering and editing text, inserting and deleting slides in a presentations , preparation of slides , adding clip arts, charts etc., Providing Aesthetics , Enhancing text presentation ,working with color lines styles and movie and sound ,adding header and footer, presentation.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To develop proficiency in Advanced Word Processing Features

CO 2. To develop proficiency in Advanced Spreadsheet Techniques

CO 3. To develop proficiency in Presentation Software.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHS-306	Human Values & Professional Ethics	Gen	4

UNIT-1

Need, Basic Guidelines, Content and Process for Value Education

Understanding the need, basic guidelines, content and process for Value Education

Self-Exploration its content and process, Natural Acceptance' and Experiential Validation- as the

mechanism for self-exploration

Continuous Happiness and Prosperity- A look at basic Human Aspirations

Right understanding, Relationship and Physical Facilities- the basic requirements for fulfilment of aspirations of every human being with their correct priority
 Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
 Method to fulfil the above human aspirations: understanding and living in harmony at various levels

UNIT 2:

Understanding Harmony in the Human Being
 Understanding the Body as an instrument
 Understanding the harmony of Body, correct appraisal of Physical needs, meaning of Prosperity in detail

UNIT 3:

Understanding Harmony in the Family and Society-
 Harmony in Human Relationship
 Understanding Harmony in the family – the basic unit of human interaction
 Understanding values in human-human relationship
 Trust and Respect as the foundational values of relationship
 Understanding the meaning of trust
 Difference between intention and competence. Understanding the meaning of respect
 Understanding the harmony in the society (society being an extension of family)

UNIT-4

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

Course Outcomes:

Upon completion of this course the student will be able to:

- CO 1.** To develop competence in professional ethics, including utilizing professional skills to promote universal human order and identifying people-friendly and eco-friendly production systems.
CO 2. To understand the human body as an instrument and its role in achieving harmony.
CO 3. To understand the concept of self-exploration and the role of "natural acceptance" and experiential validation in this process.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHSP-301	Sterilization Techniques -1 Lab	Skill	2

- High Temperature Sterilization
- Anatomy of steam sterilizer
- Steam Sterilizer Cycles
- Basic work practices- Preparing Devices and packs for sterilization
- Loading a sterilizer
- Controlling wet packs
- Extended sterilization cycles, Sterilization Quality Control
- Sterilization equipment functions - guidelines & policies
- Preparation of sterilization equipment
- operating system of sterilizer
- Unloading & releasing sterilized loads, HSE procedures, quality management requirements compilation.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the principles and importance of high-temperature sterilization in healthcare settings.

CO 2. Identify different cycle options and their applications in sterilizing medical devices and instruments..

CO 3. Implement quality control measures to ensure the effectiveness of sterilization processes and the quality of sterilized items.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHSP-302	Regulations and Standards in CSSD Lab	Skill	2

- Regulatory Agencies – US Food and Drug Administration
- Centre for Disease Control and Prevention
- US Department of Transportation
- US Environmental Protection Agency
- Occupational Safety and Health Administration
- Centres for Medicare and Medicaid Services
- State Regulatory Agencies.
- Professional Associations – Association for Advancement of Medical Instrumentation, American National Standards Institute, International Standard Organizations, The Joint Commission, National Fire Protection Association

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. To understand the hands-on activities related to regulatory compliance, such as navigating regulatory websites, interpreting regulatory documents, and applying standards and guidelines in healthcare settings.

CO 2. Implementing by participating in activities related to professional association membership, including accessing resources, networking opportunities, and educational offerings.

CO 3. Develop skills and competencies essential for ensuring regulatory compliance and promoting quality and safety in healthcare environments.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHSP-303	Monitoring in CSSD Lab	Skill	2

Demonstration of:

- General Monitoring, Decontamination Area Monitoring – Water Quality, Mechanical Cleaning Equipment.
- High Level Disinfection Monitoring – Chemical Disinfection Monitoring
- Manual Disinfection
- Automated Endoscope Repressor Monitoring.
- Sterilization Monitoring – Process Indicators
- Physical Monitoring, Biological Indicators, Process Challenge devices, Implants
- Sterilizer Specific Monitoring
- Dynamic Air Removal Sterilizers
- Gravity Sterilizers, Immediate use steam sterilizers
- Multiple cycle testing
- Table top Steam Sterilizers
- Hydrogen Peroxide Sterilizers.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate proficiency in conducting general monitoring activities to ensure the effectiveness of decontamination processes and equipment.

CO 2. Implement appropriate monitoring procedures to verify the efficacy of high-level disinfection and ensure patient safety.

CO 3. Hands-on demonstrations, students will develop practical skills and competencies essential for monitoring and ensuring the effectiveness of decontamination, disinfection, and sterilization processes in healthcare settings, thereby contributing to patient safety and quality of care.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHSP-304	CSSD Technology I Lab	Skill	2

Demonstration of:

- Decontamination of work area - Design and location of the decontamination area
- Dress code and personal behaviours
- Work Setup
- Cleaning Tools
- Steps in the process of decontamination
- Cleaning methodologies
- Disinfection – Introduction to disinfectants
- Types of disinfectants
- Safe work practices when performing manual disinfection
- Quality assurance for disinfection
- Assembly and Packaging – The physical environment
- Dress code and behaviour
- Pack Preparation - Goals, Guidelines, Procedures.
- Disposable Packing Material
- Wrapping Techniques
- Methods of Pack Closure
- Pack Labelling
- Special Packing Concerns.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Design and Location of Decontamination Area

CO 2. Identifying Different Types of Disinfectants and Their Uses

CO 3. Understanding the Physical Environment Requirements for Assembly and Packaging

CO 4. Understanding the Importance and Guidelines for Pack Labeling

CO 5. Demonstrate the assembly and packaging procedures in their respective work environments, particularly in healthcare or similar settings where infection control and prevention are paramount.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	3	2	3
CO 2	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	2	3	2	3	2	2
CO 4	3	2	3	2	3	3	2	3	2
CO 5	3	3	2	2	3	2	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHSP-305	Advance Computing Skills Lab	Skill	2

Demonstration of:-

- Word Processing
- Mail merge techniques
- Using Charts , shapes and pictures in word .

- Basics of Spreadsheet
- document saving and printing the worksheet
- formulas , Functions and charts
- Advance Spreadsheet Tools
- worksheet.
- Presentation Software
- Using Powerpoint working with color lines styles and movie and sound ,presentations

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understanding the mail merge feature to personalize and automate mass communication.

CO 2. Ability to customize visuals to enhance document aesthetics and clarity.

CO 3. Ability to design and format slides effectively for visual appeal and clarity.

CO 4. Interpret necessary skills and knowledge to effectively utilize word processing, spreadsheet, and presentation software for various personal and professional tasks.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3

BVOC (Hospital Sterilization) IVth Sem

Course Code	Course Name	Type of Course	Credits
BVHS-401	Sterilization Techniques- II	Skill	4

- Unit 1 Low Temperature Sterilization
 - Basic Sterilization Requirements
 - Safety& guidelines recommendation
 - Ethylene Oxide-Background, Efficacy, Penetration
 - Sterilization cycle and process parameters, safety, packaging, loading and unloading Aeration
 - Sterilization Performance Monitors.
- Unit 2 Hydrogen Peroxide Systems
 - Hydrogen peroxide gas plasma
 - Vaporized Hydrogen peroxide
 - Ozone Sterilization-Efficacy, Penetration, Sterilization cycle and process parameters, safety, Exposure Monitoring, Materials Compatibility, Packaging, loading ozone steriliser
 - Sterilizer performance monitor.
- Unit 3
 - Operating and monitoring of steam autoclave
 - ETO
 - Sonic washer
 - Other sterilizing methods .

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Implementing Safety Guidelines and Recommendations for Low Temperature Sterilization Processes.

CO 2. Understanding the Importance of Aeration in the Ethylene Oxide Sterilization Process

CO 3. Understanding Hydrogen Peroxide Gas Plasma and Vaporized Hydrogen Peroxide Sterilization Methods

CO 4. Understand the importance of safety protocols, process parameters, and performance monitoring to ensure effective and safe sterilization practices in healthcare and related environments.

CO 5. Knowledge and practical skills in low-temperature sterilization methods, including ethylene oxide, hydrogen peroxide systems, steam autoclave operation, and other sterilizing methods.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHS-402	CSSD Technology II	Skill	4

- Unit 1 Point of Use Processing
 - Immediate use of steam sterilization- History, Standards and recommended practices, Procedures
 - Quality control Monitors.
- Unit 2 Point of Use Processing for Heat sensitive devices
 - Low Temperature Disinfection and sterilization process
 - Preparation of devices
 - Quality control monitors for point of use low temperature processes
 - Terminal sterilization

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understanding the Concept and History of Immediate Use Steam Sterilization

CO 2. Implementing Quality Control Monitors to Ensure Efficacy and Safety of Point-of-Use Sterilization Processes

CO 3. Understanding Low-Temperature Disinfection and Sterilization Processes Suitable for Heat-Sensitive Devices

CO 4. Understanding Terminal Sterilization Procedures and Implementing Them Effectively

CO 5. Explain relevant standards, recommended practices, procedures, and quality control measures to ensure the sterility and safety of medical devices at the point of use.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHS-403	CSSD Safety and Risk Management Techniques	Gen	4

- Unit 1 General Hazards and Risk Management
 - Ergonomic Concerns
 - Slip and fall concerns,
 - Electric Safety concerns, sharp concerns
 - General Chemical Hazards
- Unit 2 Hazardous Substance Concerns
 - Workplace violence
 - Area specific safety concerns
 - Soiled receiving and decontamination areas
 - Supply receiving, breakout and storage areas
 - Surgical service areas.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand and Addressing Ergonomic Concerns to Prevent Musculoskeletal Injuries.

CO 2. Identify and Manage General Chemical Hazards Through Proper Storage, Handling, and Use Practices

CO 3. Understand the Mitigating Risks of Workplace Violence through Prevention and Response Strategies

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHS-404	Medical Ethics and Patients Care	Gen	2

UNIT 1

Medical ethics - Definition - Goal - Scope

Introduction to Code of conduct

UNIT 2

Basic principles of medical ethics –Confidentiality

Malpractice and negligence - Rational and irrational drug therapy

UNIT 3

Autonomy and informed consent - Right of patients

Care of the terminally ill- Euthanasia

UNIT 4

Organ transplantation, Medico legal aspects of medical records –Medico legal case and type-

Records and document related to MLC - ownership of medical records - Confidentiality

Privilege communication - Release of medical information - Unauthorized disclosure -

retention of medical records - other various aspects, Professional Indemnity insurance policy,

Development of standardized protocol to avoid near miss or sentinel events, Obtaining an informed consent

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Define medical ethics and understand its goals, scope, and relevance in healthcare practice.

CO 2. Understand concepts of malpractice and negligence in healthcare delivery and strategies for risk mitigation.

CO 3. Discuss the principles of patient autonomy and informed consent, including ethical

considerations in treatment decision-making.

CO 4. Explain the principles of confidentiality and its importance in maintaining patient privacy and trust.

CO 5. Explore strategies for mitigating medico-legal risks and ensuring ethical conduct in healthcare practice.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHS-405	CSSD Instrumentation	Gen	2

- Unit 1 Medical instrumentation
 - Generalized Medical Instrumentation System
 - Alternative Operating Modes
 - Medical Measurement Constraints
 - Classifications of medical Instruments
 - Generalized statistic and Dynamic Characteristics
 - Regulation of Medical Devices
- Unit 2 Care of reusable medical devices and surgical equipment:
 - Safe practices
 - Collection of contaminated items and equipment
 - Sorting and processing of items
 - Decontamination of medical instruments
 - Cleaning process
 - Reuse of single use devices
 - Sterilization of Rubber items/ poly carbon materials
- Unit 3 Preparation, Inspection, assembly, packing and labelling of items for sterilization
 - Packing area preparation
 - Preparation and inspection of items
 - Assembly and packing of items
 - Labelling of items
 - Documentation: Recording and Reporting
 - Management of Theatre Linen/ hospital linen
 - Assessment and classifying theatre linen decontamination of linen
 - Sterilization of linen
 - Folding theatre linen
 - Packing and storage of theatre linen
 - Distribution

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the Generalized Medical Instrumentation System and its Components.

CO 2. Classify Medical Instruments based on Functionality and Application.

CO 3. Implement Safe Practices for Handling and Processing Reusable Medical Devices and Surgical Equipment

CO 4. Understand and Implement Sterilization Processes for Rubber Items and Polycarbonate Materials

CO 5. Interpret accurate and legible labeling of items to facilitate identification and tracking

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3

CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHS-406	Advance Communication & Soft Skills	Gen	2

UNIT-1

Functional Grammar-II

- Application writing
- Paragraph writing, essay writing and précis writing
- Pre-testing of oral and writing skills

UNIT-2

Professional Skills

- Biodata, CV and resume writing
- Joining letter, cover letter and resignation letter
- Inter- office memo, formal Business letter, informal notes
- Minutes of the meeting, reporting events, summary writing

UNIT-3

Presentation skills

- Power-point presentations and presenting techniques
- Body language
- Describing people, places and events
- Extempore, speech and just- a minute sessions

UNIT-4

Interview skills

- Developing skills to- debate, discussion, basics of GD and styles of GD
- Discussion in groups and group discussion on current issues
- Steps to prepare for an interview and mock interviews

Public speaking

- Art of public speaking
- Welcome speech
- Farewell speech
- Votes of thanks

Oral practice

- Debate
- Just-a-minute
- Group discussion
- Mock interviews

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate advanced verbal and non-verbal communication skills in various contexts, including presentations, meetings, and interpersonal interactions.

CO 2. Understand the proper use of grammar, punctuation, and formatting conventions to enhance readability and professionalism.

CO 3. Demonstrate integrity, accountability, and ethical decision-making in leadership roles and team interactions.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2

CO 3	3	3	3	3	3	3	3	2	2
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Course Code	Course Name	Type of Course	Credits
BVHSP-401	Sterilization Techniques- II Lab	Skill	2

Demonstration Of:-

- Low Temperature Sterilization – Basic Sterilization Requirements
- Safety & guidelines recommendation
- Ethylene Oxide - Background, Efficacy, Penetration, sterilization cycle and process parameters, safety
- Packaging, loading and unloading Aeration
- Sterilization Performance Monitors
- Hydrogen Peroxide Systems – Hydrogen peroxide gas plasma, Vaporized Hydrogen peroxide
- Ozone Sterilization-Efficacy, Penetration, Sterilization cycle and process parameters, safety.
- Exposure Monitoring, Materials Compatibility, Packaging
- Loading ozone sterilizer, Sterilizer performance monitor.
- Operating and monitoring of steam autoclave, ETO, sonic washer and other sterilizing methods.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Implement Safety Guidelines and Recommendations for Low Temperature Sterilization Processes

CO 2. Implement Sterilizer Performance Monitors to Ensure Efficacy and Safety

CO 3. Implement Safety Protocols and Process Parameters for ETO

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHSP-402	CSSD Technology II Lab	Skill	3

Demonstration of :-

- Point of Use Processing- Immediate use of steam sterilization- Standards and recommended practices
- Procedures
- Quality control Monitors.
- Point of Use Processing for Heat sensitive devices-Low Temperature Disinfection and sterilization process
- Preparation of devices
- Quality control monitors for point of use low temperature processes
- Terminal sterilization

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Implement Quality Control Monitors to Ensure the Efficacy and Safety of Immediate Use Sterilization Processes

CO 2. Understand and Implement Preparation Techniques for Heat-Sensitive Devices

CO 3. Implementing Quality Control Monitors Specific to Point-of-Use Low-Temperature Processes

CO 4. Describe relevant standards, recommended practices, procedures, and quality control measures to ensure the sterility and safety of medical devices at the point of use.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3

Course Code	Course Name	Type of Course	Credits
BVHSP-403	CSSD Safety and Risk Management Techniques Lab	Skill	3

Demonstration of :-

- General Hazards and Risk Management - Ergonomic Concerns
- Slip and fall concerns
- Slip and fall concerns
- Electric Safety concerns
- Sharp concerns
- General Chemical Hazards
- Hazardous Substance Concerns
- Workplace violence, Area specific safety concerns
- Soiled receiving and decontamination areas, Supply receiving, breakout

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Identify Ergonomic Concerns and Implementing Measures to Mitigate Risks of Musculoskeletal Injuries

CO 2. Identify and Manage General Chemical Hazards Through Proper Storage, Handling, and Use

CO 3. Identify and Address Area-Specific Safety Concerns Relevant to Different Work Environments

CO 4. Implement Safety Protocols for Soiled Receiving and Decontamination Areas to Prevent Cross-Contamination.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3

Course Code	Course Name	Type of Course	Credits
BVHSP-404	Medical Ethics and Patients Care Lab	Skill	2

Demonstration of:

- law and liability and duties of staff
- Workplace issues
- Bioethical issue
- Care and handling of patient
- Medico legal cases
- emergency care and life support skills
- CPR
- Vital signs and primary assessment
- bag-valve-masks

Upon completion of this course the student will be able to:

CO 1. Understand the legal duties and responsibilities of healthcare staff in providing care to patients, ensuring patient safety, and maintaining confidentiality.

CO 2. Understand the importance of workplace safety and health regulations, including infection control measures, hazardous materials management, and ergonomic principles.

CO 3. Understand how to document patient care accurately, comprehensively, and ethically to meet legal and regulatory requirements.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHSP-405	CSSD Instrumentation Lab	Skill	2

DEMONSTRATION OF:

- Unit 1 Medical instrumentation
 - Generalized Medical Instrumentation System
 - Alternative Operating Modes
 - Medical Measurement Constraints
 - Classifications of medical Instruments
 - Generalized statistic and Dynamic Characteristics
 - Regulation of Medical Devices
- Unit 2 Care of reusable medical devices and surgical equipment:
 - Safe practices
 - Collection of contaminated items and equipment
 - Sorting and processing of items
 - Decontamination of medical instruments
 - Cleaning process
 - Reuse of single use devices
 - Sterilization of Rubber items/ poly carbon materials
- Unit 3 Preparation, Inspection, assembly, packing and labelling of items for sterilization
 - Packing area preparation
 - Preparation and inspection of items
 - Assembly and packing of items
 - Labelling of items
 - Documentation: Recording and Reporting
 - Management of Theatre Linen/ hospital linen
 - Assessment and classifying theatre linen decontamination of linen
 - Sterilization of linen
 - Folding theatre linen
 - Packing and storage of theatre linen
 - Distribution

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the Generalized Medical Instrumentation System and its Components.

CO 2. Classify Medical Instruments based on Functionality and Application.

CO 3. Implement Safe Practices for Handling and Processing Reusable Medical Devices and Surgical Equipment

CO 4. Understand and Implement Sterilization Processes for Rubber Items and Polycarbonate Materials

CO 5. Interpret accurate and legible labeling of items to facilitate identification and tracking

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
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CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

BVOC (Hospital Sterilization)

Vth Sem

Course Code	Course Name	Type of Course	Credits
BVHS-501	Quality assurance in CSSD department	Skill	4

Unit 1 Importance quality assurance and quality control

- Quality in central service department
- Components of quality
- Planning tools and procedures

Unit 2 Quality control indicators

- Quality concerns
- Quality central service procedures
- Quality in central service processing areas- Decontamination area, preparation and packing area
- Quality programme alternatives

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the Significance of Quality Assurance and Quality Control in Central Service Departments

CO 2. Identify the Components of Quality and Their Importance in Ensuring Safe and Effective Processing of Medical Devices

CO 3. Recognize Quality Concerns and Their Implications on Patient Safety and Healthcare Delivery.

CO 4. Implement Quality Central Service Procedures to Ensure Consistency and Compliance with Standards

CO 5. Understand the importance of quality control indicators and explore alternative quality programmes to enhance overall quality assurance practices.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHS-502	Professional Etiquettes	Skill	3

- Unit 1 Professional Conduct
 - Specific Etiquettes on duty
 - Organizational hierarchy and reporting
 - Legal and ethical issues

- Unit 2 Job responsibility of CSSD Technician
 - Responsibilities of co-workers
 - Best practices in the field while complying with organization conduct
 - Individuals or team compliance with legislation
 - Protocols, guidelines and organisational systems and requirements

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand and Implement Specific Etiquettes while on Duty, including Interactions with Colleagues, Patients, and Other Healthcare Professionals

CO 2. Recognize and Adhere to Legal and Ethical Guidelines Relevant to the Healthcare Setting

CO 3. Understand the Role and Responsibilities of a CSSD Technician within the Healthcare Environment

CO 4. Implement Best Practices in the Field while Complying with Organizational Conduct Policies and Procedures.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3

Course Code	Course Name	Type of Course	Credits
BVHS-503	Inventory Control in CSSD	Gen	3

- Unit 1 Inventory
 - Handling Commercially sterilized items
 - Item locator systems
 - Loss of sterile items
- Unit 2 Equipments
 - Accessories in CSSD Department
 - Methods of Inventory control
 - Distribution of supplies – Inventory Replenishment and distribution system Sustainability
 - Role of Central Service in Inventory Management.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the Procedures for Handling Commercially Sterilized Items, including Receiving, Storage, and Distribution.

CO 2. Identify Accessories Used in the CSSD Department, such as Sterilization Wraps, Containers, and Instrument Trays

CO 3. Understand the Process of Inventory Replenishment and Distribution to Ensure Availability of Supplies While Promoting Sustainability Practices

CO 4. Recognize the Role of Central Service in Inventory Management, Including Collaborating with Other Departments to Meet Supply Needs and Ensure Proper Equipment Functionality

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3

Course Code	Course Name	Type of Course	Credits

BVHS-504	Biomedical waste management	Skill	3
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UNIT-1

Introduction to bio medical waste management: definition of bio medical waste management, hazards of bio medical waste and its management, infection control, principles of bio medical waste management.

UNIT-2

Categories of BMW: Different waste category, different types of waste, to manage bio medical waste in the work place, disposal of laboratory waste.

UNIT-3

Color coding: Use of different colors of bags, describe waste management in hospital, need for bio medical waste, history of bio medical waste, problems associated with BMW, waste treatment.

UNIT-4

Bio safety: components of safety in Operation Theater, personal protective equipments, cleaning and disinfecting medical equipments, sterilization basic care of OT.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Define biomedical waste management and understand its importance in healthcare settings.

CO 2. Understand the specific considerations for disposing of laboratory waste in accordance with biomedical waste management regulations.

CO 3. Describe the waste management practices implemented in hospitals to ensure proper handling and disposal of biomedical waste.

CO 4. Identify the components of safety in operation theaters and understand the importance of maintaining a safe environment for healthcare professionals and patients

CO 5. Apply knowledge and skills necessary to effectively manage biomedical waste, understand waste categories and color coding, and implement biosafety measures to ensure a safe healthcare environment for all stakeholders.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHS-505	Digital Literacy & Account Literacy	Gen	4

Unit 1:

Review of MS office

Advance options in MS excel

Excel

Power point

Introduction to internet learning platform

Using internet-based learning platform

Using google and you tube for learning

Using smart phone to become smart

UNIT-2

Benefits of digital learning

Using internet for personal requirement

Online payments method

Use of social media for advisement

Digital security and privacy

Various cybercrime and their safety guideline

Best practice for securing online and network transaction
Managing privacy and security and social media accounts

UNIT-3

Introduction and basic of financial planning

Concept of time and value of money

Risk and return

Myths about easy money

Financial planning with examples

Introduction to financial market and institution investment option in post office

Sources of finance

Capital market basics

Basic of money market

Mutual funds

UNIT-4

Life insurance

General insurance

Types of banks

KYC

Function of commercial banks and RBI and its function

Deposit accounts-understanding of operation

Retail finance

Personal loan

Corporate banking

Cheque collecting services

Payments modes in banking system

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Discover the educational resources available on Google and YouTube for self-directed learning and professional development.

CO 2. Understand the importance of digital security and privacy in safeguarding personal information and sensitive data online.

CO 3. Understand the concept of time value of money and its implications for financial decision-making, including future value, present value, and compound interest.

CO 4. Understand the Know Your Customer (KYC) process and its importance in verifying customer identity and preventing financial fraud and money laundering.

CO 5. Learn how insurance products provide financial protection against risks such as death, disability, accidents, and property damage.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHS-506	Introduction to National Healthcare System	Gen	3

UNIT-1

1. Introduction to healthcare delivery system

- Healthcare delivery system in India at primary, secondary and tertiary care
- Community participation in healthcare delivery system
- Health system in developed countries.
- Private Sector
- National Health Mission
- National Health Policy

g. Issues in Health Care Delivery System in India

UNIT-2

2. National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme.

UNIT-3

3. Introduction to AYUSH system of medicine

- a. Introduction to Ayurveda.
- b. Yoga and Naturopathy
- c. Unani
- d. Siddha
- e. Homeopathy
- f. Need for integration of various system of medicine

UNIT-4

4. Health scenario of India- past, present and future

Demography & Vital Statistics-

- a. Demography – its concept
 - b. Vital events of life & its impact on demography
 - c. Significance and recording of vital statistics
 - d. Census & its impact on health policy
6. Epidemiology
- a. Principles of Epidemiology
 - b. Natural History of disease
 - c. Methods of Epidemiological studies
 - d. Epidemiology of communicable & non-communicable diseases, disease transmission, cold chain, immunization, disease monitoring and surveillance.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Compare and contrast the healthcare delivery systems in developed countries with that of India.

CO 2. Analyse the role of the private sector in healthcare delivery, including hospitals, clinics, diagnostic centers, and pharmaceutical companies.

CO 3. Evaluate the operational mechanisms and implementation strategies of national health programs at the national, state, and local levels.

CO 4. Understand the concept and principles of the AYUSH system of medicine, including Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3

Course Code	Course Name	Type of Course	Credits
BVHSP-501	Quality assurance in CSSD department Lab	Skill	2

DEMONSTRATION OF:

- Quality assurance and quality control
- Quality in central service department
- Components of quality
- Planning tools and procedures
- Quality control indicators, quality concerns
- Quality central service procedures
- Quality in central service processing areas- Decontamination area, preparation and packing area, Quality programme alternatives

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate the Use of Planning Tools and Procedures to Implement Quality Assurance and Quality Control Measures.

CO 2. Demonstrate Quality Central Service Procedures to Ensure Consistency and Compliance with Established Protocols.

CO 3. Implement Quality Control Measures in Central Service Processing Areas, Including Decontamination, Preparation, and Packing Areas

CO 4. Demonstrate Implementation of Quality Programme Alternatives to Address Specific Needs and Challenges

CO 5. Implement alternative quality programme options to enhance overall quality assurance practices.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHSP-502	Professional Etiquettes Lab	Skill	2

- Professional Conduct
- Prepare Specific Etiquettes on duty
- Prepare Organizational hierarchy and reporting , Legal and ethical issues
- Prepare Job responsibility of CSSD Technician, Responsibilities of co-workers
- Develop Best practices in the field while complying with organization conduct, Individuals or team compliance with legislation, Protocols, guidelines and organisational systems and requirements

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Develop specific etiquettes for on-duty behavior, such as maintaining confidentiality, respecting patients' rights, and interacting professionally with colleagues and patients.

CO 2. Demonstrate knowledge of legal and ethical issues relevant to the healthcare environment, including patient privacy laws, informed consent, and ethical treatment of patients.

CO 3. Implement protocols and guidelines to ensure the safe and effective sterilization of medical equipment and instruments in accordance with industry standards.

CO 4. Apply knowledge and skills necessary to uphold professional conduct standards, fulfill job responsibilities effectively as CSSD Technicians, and ensure compliance with legislation, protocols, and guidelines in the healthcare environment.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	2	2	2	3	3	3

Course Code	Course Name	Type of Course	Credits
BVHSP-503	Inventory Control in CSSD Lab	Skill	2

- Maintaining Inventory

- Handling Commercially sterilized items
- Item locator systems, loss of sterile items
- Equipment-Accessories in CSSD Department
- Methods of Inventory control
- Distribution of supplies – Inventory Replenishment and distribution system,, Sustainability
- Role of Central Service in Inventory Management.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate knowledge of handling commercially sterilized items, including receiving, storing, and distributing them according to established protocols.

CO 2. Develop strategies to prevent loss of sterile items through proper storage, handling, and tracking methods.

CO 3. Identify different methods of inventory control, including manual tracking, barcode scanning, and computerized inventory management systems.

CO 4. Develop sustainable practices for managing inventory to minimize waste and optimize resource utilization.

CO 5. Apply knowledge and skills necessary to effectively manage inventory in the CSSD department, including handling commercially sterilized items, implementing item locator systems, controlling inventory, distributing supplies, and fulfilling the role of Central Service in inventory management.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	2	2	2	3	3	3
CO 5	3	3	3	3	3	3	2	2	2

Course Code	Course Name	Type of Course	Credits
BVHSP-504	Biomedical waste management Lab	Skill	2

- Biomedical waste management
- Rules of biomedical waste management
- Categories of biomedical waste
- hazards associated with hospital waste , decontamination of hospital waste
- Segregation
- transportation and disposal of biomedical waste
- Liquid waste, Centralized biomedical waste management facility
- Accident reporting , Issues while handling sharp
- Immediate measure.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Demonstrate knowledge of rules and regulations governing biomedical waste management.

CO 2. Identify different categories of biomedical waste and their specific characteristics.

CO 3. Identify the challenges associated with liquid biomedical waste management.

CO 4. Apply knowledge and skills necessary to effectively manage biomedical waste in healthcare facilities, including understanding regulations, categorizing waste, identifying hazards, implementing proper handling and disposal procedures, and taking immediate measures in case of accidents or incidents.

CO 5. Apply to prioritize safety and compliance to ensure the health and well-being of patients, staff, and the community.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	2	2	2	3	3	3
CO 5	3	3	3	3	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHSP-505	Digital Literacy & Account Literacy Lab	Skill	2

- Uses Advance options in MS excel
- Excel
- Power point
- Using internet-based learning platform
- Using google and you tube for learning
- Using smart phone to become smart
- Using internet for personal requirement
- Online payments method
- Use of social media for advisement

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Develop knowledge, skills, and competencies necessary to leverage advanced features in MS Excel and PowerPoint.

CO 2. Develop to navigate internet-based learning platforms effectively

CO 3. Develop to utilize Google and YouTube for learning purposes.

CO 4. Develop to harness the potential of smartphones for learning and productivity.

CO 5. Develop to manage online payments securely, and leverage social media for personal and professional advancement.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

BVOC (Hospital Sterilization)

VIth Sem

Course Code	Course Name	Type of Course	Credits
BVHS-601	Sterile storage and transportation	Gen	6

- Unit 1 Sterile stock management
 - Sterile stock – storage and transportation
 - Maintain packaging integrity
 - Maintain stock levels
 - Distribution to various units
 - Safe and healthy working environment
- Unit 2 Storage Considerations
 - Location, Space, Storage Considerations
 - Storage shelving ,receipt of storage items
 - In house sterilized items, Purchased pre sterilized items
 - Event related sterility, product life

- Unit 3 Storage/ Transportation Conditions
 - Handling , Basic storage guidelines
 - Stock rotation
 - Transportation – Hand carry, Cart transport, Elevator/Lift ,Transportation guidelines.

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Understand the principles of sterile stock management, including storage and transportation requirements.

CO 2. Develop skills in maintaining appropriate stock levels to meet the needs of various units.

CO 3. Identify key considerations for storage, including location, space, and shelving requirements.

CO 4. Develop skills in handling sterile stock and implementing basic storage guidelines to maintain sterility.

CO 5. Understand different transportation methods, such as hand-carry, cart transport, and elevator/lift transport, and adhere to transportation guidelines to prevent contamination or damage during transit.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHS-602	Administration in CSSD	Gen	6

- Unit 1 Administration
 - Definition , Purpose, Techniques
 - CSSD Department Management - Process, Principles, Functions
- Unit 2
 - Planning
 - Organizing
 - Delegating
 - Directing
 - Leadership
 - Communication
 - Supervision
 - Group Dynamics, Controlling, Material Management, Documentation

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Define administration and understand its purpose and techniques within the CSSD context.

CO 2. Understand the importance of organizing resources, such as personnel, equipment, and supplies, to optimize CSSD efficiency.

CO 3. Develop effective communication skills for conveying information, instructions, and feedback within the CSSD team and with other departments

CO 4. Understand the role of supervision in overseeing CSSD operations and ensuring compliance with standards and protocols.

CO 5. Develop skills in documentation practices to maintain accurate records of CSSD activities, including sterilization cycles, equipment maintenance, and inventory management.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
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CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHSP-601	Sterile storage and transportation Lab	Skill	2

Demonstrate skill in

- -Identify compromised stock:
- -Incorrectly packed
- -Torn or opened
- -Wet at the end of sterilizing cycle
- -Placed on dirty surfaces
- -No sterilizing indicator
- Occupational hazards/handling sharps

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Able to visually inspect stock for signs of compromise, such as incorrectly packed items, torn or opened packaging, and items placed on dirty surfaces.

CO 2. Able to recognize indicators of compromised sterility, such as wetness at the end of the sterilizing cycle or the absence of sterilization indicators.

CO 3. Understanding the importance of using appropriate personal protective equipment (PPE) when handling sharps to prevent injuries and exposure to bloodborne pathogens.

CO 4. Able to safely handle and dispose of sharps according to established protocols and regulations.

CO 5. Apply knowledge and skills necessary to identify compromised stock and recognize occupational hazards associated with handling sharps.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Course Code	Course Name	Type of Course	Credits
BVHSP-602	Administration in CSSD Lab	Skill	2

Demonstrate skill in

- Administration-Techniques
- CSSD Department Management - Process, Principles, Functions
- Planning
- Organizing
- Delegating
- Directing

- Leadership, Communication, Supervision, Group Dynamics, Controlling, Material Management, Documentation

Course Outcomes:

Upon completion of this course the student will be able to:

CO 1. Develop skills in documenting CSSD activities, including sterilization cycles, equipment maintenance, inventory management, and quality control measures.

CO 2. Develop strategies for promoting positive group dynamics and fostering teamwork and collaboration among CSSD staff members.

CO 3. Develop leadership skills necessary for effectively managing CSSD operations, including decision-making, conflict resolution, and team building.

CO 4. Apply knowledge and skills necessary to effectively manage CSSD operations and functions through proficient administration techniques and departmental management principles.

CO 5. Design to plan, organize, delegate, direct, lead, communicate, supervise, manage group dynamics, control operations, handle materials, and maintain documentation in the CSSD setting to ensure the delivery of safe and high-quality sterile services.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	2	3	3	3	2	2

Bachelor of Vocational Studies Program Outcomes (POs) for B.Voc

PO1	Disciplinary Knowledge: Demonstrate comprehensive knowledge of one or more disciplines that form a part of an undergraduate B.Voc programme Execute strong theoretical and practical understanding generated from the chosen B.Voc programme.
PO2	Critical Thinking and Problem solving: Exhibit the skill of critical design thinking and use them to predict a range of creative solutions towards a design problem, evaluate them and choose the most appropriate options.
PO3	Social Competence Exhibit thoughts and ideas effectively in writing and orally; communicate with others using appropriate media, build effective interactive and presenting skills to meet global competencies and connect to people individually or in group settings.
PO4	Research-Related Skills: Demonstrate a sense of inquiry and capability for asking relevant/appropriate questions; ability to plan, execute and report the results of an experiment Employ knowledge of the avenues for research and higher academic achievements in the chosen field and allied subjects and aware about research ethics, intellectual property rights and issues of plagiarism.
PO5	Personal and Professional competence: Perform independently and participates in team activities and demonstrates cooperation. Integrate enthusiasm and commitment to improve personal and team performance levels and build skills to achieve the goals.
PO6	Effective Citizenship and Ethics : Demonstrate empathetic social concern and equity centred national development; ability to act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.
PO7	Environment and Sustainability: Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.
PO8	Self-directed and Life-long learning: Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.
PO9	Trans-disciplinary Research competence: Create new conceptual, theoretical, methodological innovations that integrate and transcend beyond discipline-specific approaches to address a common problem.

BVOC (HOTEL MANAGEMENT) 1st Sem

Course Code	Course Name	Content Type	Credit
BVHOM-101	Foundation in Food Production – I	Skill	3

UNIT - 1 PROFESSIONAL STANDARD AND ETHICS FOR FOOD HANDLERS:

Personal hygiene, General kitchen hygiene and sanitation, HACCP (Hazard Analysis and Critical Control Points) Ethics in the kitchen

UNIT - 2 FOOD COMMODITIES: Classification of Ingredients Characteristics of Ingredients Uses of Ingredients, Food and its relation to health Definition of Basal Metabolism, Major nutrients – functions, sources and deficiency of Carbohydrates, Proteins, Fat, Vitamins, Minerals, Water and Fibre.

UNIT - 3 COOKING FUELS AND KITCHEN EQUIPMENT: Types of cooking fuels Uses of cooking fuels Safety precautions, Classification of Kitchen Equipment Uses of Kitchen Equipment, Care and maintenance.

UNIT - 4 PROCESSING OF COMMODITIES: Cleaning and pre-preparation of food commodities, Quality points & cuts of fruit, vegetables, fish, lamb, beef, pork, poultry and game

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Develop understanding and adherence to professional standards and ethics in food handling, emphasizing personal and kitchen hygiene, HACCP principles, and ethical conduct.

CO2 Develop knowledge of food commodities, including their classification, characteristics, uses, and their impact on health, covering basal metabolism, major nutrients, and their sources and deficiencies.

CO3 Demonstrate proficiency in handling cooking fuels safely, understanding their types, uses, and precautions, along with the classification, uses, and maintenance of kitchen equipment.

CO4 Understand the techniques of cleaning and pre-preparation of food commodities, and understand the quality points and cuts of various food items such as fruits, vegetables, fish, meat, and poultry.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	2	3	3	2	3	2	3	2	3
CO 3	3	3	3	3	3	2	3	3	3
CO 4	2	3	3	2	2	2	3	3	3

Code	Subject	Category	Credit
BVHOM-102	Foundation in Food and Beverage Service – I	Skill	3

UNIT - 1 FOOD & BEVERAGE SERVICE INDUSTRY: Introduction to Food and Beverage Service Types of catering operations

UNIT - 2 Attributes of Food & Beverage Service Personnel Food & Beverage Service

Organization: Organizational Hierarchy of the F & B Department, Job Specifications for the F & B Department, Job Descriptions, (Director de Restaurant (Restaurant Manager), Maitre d'hotel (Sr. Captain), Chef de Rang (Station waiter), Busboy, Hostess, Sommelier (Wine waiter), RSOT, Chef d'etage (Floor Waiter)

UNIT - 3 FOOD & BEVERAGE SERVICE AREAS WITH HIERARCHIES:

Restaurant, Coffee Shop, Room Service, Bar, Banquets

UNIT - 4 F & B SERVICE EQUIPMENT: Furniture, Linen, Chinaware, Silverware, (Flatware, Hollowware), Glassware, Disposables, Special Equipment (Trolleys, Electrical equipment etc), Personal Equipment

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand Basics of Food & Beverage Service.

CO2 Understand F&B service personnel attributes, department hierarchy, job specs, and descriptions for various roles.

CO3 Understand hierarchy and operations of F&B service areas: Restaurant, Coffee Shop, Room Service, Bar, Banquets.

CO4 Understand F&B service equipment: Furniture, Linen, Chinaware, Silverware, Glassware, Disposables, Special Equipment, and Personal Equipment.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	3	2	2	3	3
CO 2	3	2	3	3	3	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3
CO 4	3	2	2	3	2	2	2	3	3

Code	Subject	Category	Credit
BVHOM-103	Foundation in Front Office Operations – I	Skill	2

UNIT -1 INTRODUCTION TO TOURISM, HOSPITALITY AND

HOTEL

INDUSTRY: Tourism and its importance, Concept of Hospitality and its origin, Origin, History, Growth and Development of hotel industry – India and global, Classification and Categorization of Hotel Industry.

UNIT – 2 HOTEL ORGANIZATION: Introduction to Front Office, Basic Activities of Front Office, F O Layout & Equipment, Various Sections of Front Office, Organization Structure of Front Office department of a 5 star and 3-star Component hotel.

UNIT - 3 FRONT OFFICE PRODUCTS: Types of rooms, Types of room rates, Types of plans Room status definitions

UNIT - 4 INTRODUCTIONS TO GUEST CYCLE HANDLING: Pre-arrival, Arrival, Occupancy, Departure

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand insights into tourism's significance, hospitality's origins, and hotel industry's history, growth, classification, and categorization.

CO2 Understand Front Office basics, layout, equipment, and organization structure in 5-star and 3-star Component hotels.

CO3 Understanding the significance of Front Office

CO4 understand the working pattern of the organization while handling the guest in the hotel.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	2	2	2	3	3
CO 2	3	2	3	3	2	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3
CO 4	3	2	2	3	2	2	2	3	3

Code	Subject	Category	Credit
BVHOM-104	Foundation in House Keeping Operations – I	Skill	2

UNIT - 1 HOUSE KEEPING DEPARTMENT: Organizational frame work of the

department (large, medium, small), Role of key personnel in housekeeping, Job description and job specification of staff in the department, Qualities of the house keeping staff, Skills of a good house keeper (Managerial, technical, Conceptual), Inter departmental coordination with more emphasis on front office and maintenance, Department and the relevant sub sections.

UNIT – 2 HOTEL GUEST ROOM: Types of guest rooms, Layout out of guest rooms (types), Layout of floor pantry

UNIT – 3 FURNITURE AND FIXTURE: Furniture, fixture, guest supplies, amenities in a guest room (to be dealt in brief only), Accessories, Daily cleaning of occupied, departure, vacant, under repair, VIP rooms

UNIT – 4 CLEANING: Weekly cleaning, spring cleaning, Evening service, Systems and procedures involved, Cleaning process, Cleaning and upkeep of public areas (lobby, cloak room, restaurants, bar, banquet halls, admin offices, lifts and elevators, staircases, back areas, front area, corridors)

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand housekeeping department's organization, key personnel roles, staff job descriptions, qualities, skills, and inter-departmental coordination.

CO2 Understand about guest room types and layouts, including floor pantry layouts for efficient service.

CO3 Understand guest room furniture, fixtures, supplies, amenities, accessories, and daily cleaning procedures for various room statuses.

CO4 Understand cleaning procedures: weekly, spring, evening services; maintain cleanliness in public areas, including lobby, restaurants, and back areas.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3

Code	Subject	Category	Credit
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BVHOM-105	Travel & Tourism Management	General	6

UNIT - 1 TOURISM PHENOMENA: Understanding tourism – Concept and definition, meaning, concept of traveler and tourists, classification of tourism according to purpose of travel, 4 components of tourism, related definitions, impact of tourism, Origin growth and development of tourism.

UNIT – 2 GEOGRAPHY AND TOURISM: India’s bio diversity. Landscape – Physiographical structure of India, Climate and Seasons of India

UNIT – 3 TRAVEL MANAGEMENT: Transport Systems – Air, Rail, Road, Waterways, Travel Agencies – Definition, history, Role and functions, Types, Tourism Organization and Associations – Introduction, functions and organization of IATA, ICAO, WTO, STA, UFTAA, PATA, TAAI, Tour operator – Definition, Types, Importance and role of Tourist guide and related definitions

UNIT – 4 TRAVEL FORMALITIES AND REGULATIONS: Passport - definition, types in India, other passports, procedure for obtaining passport in India, Visa – definition, types, procedure for obtaining visa in India, related definitions, Foreign Exchange – Definition of currency and BTQ, Countries and currencies, RBI regulation on foreign exchange, related definitions, Brief information on Immigration, Travel insurance, health certificates, PIO cards and baggage rules.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 understanding on the nature of tourism

CO2 Understand the tourism and Travel industry and its relevance to the Hospitality industry.

CO3 Understand the various phenomenon of Tourism. Also, to comprehend the bio-diversity of tourism. Also, to know the various formalities and understand the regulations during travelling

CO4 Defining important core tourism concepts, it gradually unfolds the personality of world’s fastest growing industry by explaining its growth patterns over the years, factors responsible for its dramatic growth. Also understand the various national and international organization which coordinates with the tourism prospects and to put a guideline to promote the tourism as a whole.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	2	3	3
CO 2	3	3	3	3	3	2	2	3	3
CO 3	3	3	2	3	2	2	2	3	3
CO 4	3	3	2	3	2	2	2	3	3

Code	Subject	Category	Credit
BVHOM-106	Communication Skills	General	6

UNIT - 1 COMMUNICATION: definition, need, purpose, process, Importance of Communication in Tourism Industry, Barriers and gateways to communication, Directions of communication: Upward, Downward and Horizontal, Communication Networks: Circle, All Channel, Y, Chain, Formal and Informal Communications, Essentials of effective communication Choice of Communication Channel

UNIT – 2 LISTENING: definition, types, levels of listening, Keys to effective listening, Roadblocks to listening, The importance of feedback in interpersonal communication, Characteristics of effective feedback

UNIT – 3 EFFECTIVE SPEAKING: Essential qualities of a good speaker, Organizing the ideas of a speech, Purpose of Speech, Audience Analysis, Appearance and Bodily actions, Use of Voice, Use of visual Aids, Using the Telephone: Need for favorable voice quality

UNIT – 4 NON-VERBAL COMMUNICATION: Classification of nonverbal communication: Kinesics, Proxemics, Time Language, Paralanguage, Physical Context

UNIT – 5 WRITTEN COMMUNICATION: Principles of business communication, Process of preparing effective business messages, Planning a Message, Composing a Message, Revising a Message

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand communication's definition, importance in tourism, barriers, directions, networks, and essentials for effective communication channel selection.

CO2 Define listening types, levels, effective listening keys, roadblocks, importance of feedback, and characteristics for effective interpersonal communication.

CO3 Develop essential qualities, organize ideas, analyze audience, manage appearance, voice, visual aids, and employ favorable telephone voice quality.

CO4 Understand nonverbal communication types: Kinesics, Proxemics, Time Language, Paralanguage, and Physical Context for effective interpersonal interactions.

CO5 Understand principles, process, planning, composing, and revising effective business messages for clear and concise written communication.

CO 1	3	3	3	3	3	3	2	2	3
CO 2	3	3	2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	3	3	3	2	2	3
CO 5	3	3	3	3	2	3	2	3	3

Code	Subject	Category	Credit
BVHOMP-107	Vocational Practical- I	Skill	8

- Lay out of the kitchen. Kitchen organization chart
- Identifying & Use of Kitchen equipment Cuts of vegetables
- Cuts of meat and fish
- Briefing / Debriefing
- Restaurant Etiquette
- Mise- en- Scene/ Mise -en Place
- Identification of Equipment
- Laying and relaying a table cloth
- Rules for laying a cover
- Napkin folds
- Service of water
- Grooming and Hospitality etiquette
- Welcoming/ greeting the guest
- Basic telephone handling
- Personal hygiene in house keeping

- Housekeeping etiquette
- Bed Making
- Cleaning Rooms & Public Areas

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand kitchen layout, organization, equipment usage, and techniques for vegetable, meat, and fish cuts.

CO2 Define briefing/debriefing, restaurant etiquette, mise-en-scene, equipment identification, tablecloth laying, cover rules, napkin folds, and water service.

CO3 Understand grooming, hospitality etiquette, guest welcoming, basic telephone handling, and personal hygiene standards in housekeeping.

CO4 Demonstrate proficiency in housekeeping etiquette, bed making techniques, and cleaning both guest rooms and public areas effectively.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	2	2	3	2	2
CO 2	3	2	2	2	2	2	3	2	3
CO 3	3	2	2	3	2	3	3	2	3
CO 4	3	2	2	2	2	3	2	2	3

BVOC (HOTEL MANAGEMENT) IInd Sem

Code	Subject	Category	Credit
BVHOM-201	Food Production-II	Skill	3

UNIT – 1 AIMS AND OBJECTIVES OF COOKING FOOD: Importance of cooking food, Effects of action of heat on food- cereals, pulses, starchy vegetables, green leafy vegetable sweetening agents, meat, fish, eggs, dairy products, dairy fat, vegetable oils and fats, animal fat, nuts and oil seeds

UNIT – 2 METHODS OF COOKING: Classification, principles, equipment required, commodities that can be used, menu examples for - Boiling, Steaming, Poaching, Blanching Sautéing, Grilling, Roasting, Baking Braising,

Broiling, Microwaving, Frying. Stewing and En Papillote.

UNIT – 3 REGIONAL INDIAN CUISINE: Characteristics, ingredients used, equipment used, cooking methods for regional cuisines – Punjabi, Awadhi, Bengali, Hyderabadi, Chettinad, Coastal India, Karnataka. Glossary of Indian Culinary Terms and Popular dishes.

UNIT – 4 ART OF COOKERY: Styles of Cookery-Oriental/ Asian/ European/ Continental/ Pan American, History and Development of Modern Cuisine-Classical and Contemporary.

UNIT – 5 STOCKS, SAUCES AND SOUPS: Types of Stocks, Mirepoix, Bouquet Garni, & its Uses, Basic mother sauces, derivatives, Thickening agents used in sauces rectification of faulty sauces, miscellaneous sauces & Gravies, Jus roti and Jus lie, Soups–Classification, principles, garnishing and accompaniments, Popular international soups

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding of cooking food importance, effects of heat on various food types including cereals, vegetables, meat, dairy.

CO2 Demonstrate proficiency in cooking methods including boiling, steaming, grilling, and microwaving, understanding principles, equipment, and applicable ingredients.

CO3 Understanding characteristics, ingredients, equipment, cooking methods of regional Indian cuisines, along with glossary of culinary terms and popular dishes.

CO4 Demonstrate proficiency in Oriental, Asian, European, Continental, and Pan American styles of cookery, understanding the history and development of modern cuisine.

CO5 Understanding the preparation of stocks, sauces, and soups, including types, basic mother sauces, thickening agents, derivatives, garnishing, and popular international varieties.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	3	2	2	2	2	3	2
CO 2	3	2	3	2	2	2	2	3	2
CO 3	3	3	2	2	2	2	2	2	2
CO 4	3	3	2	3	2	2	2	3	3
CO 5	3	2	2	3	2	2	2	2	3

Code	Subject	Category	Credit
BVHOM-202	Food and Beverage Services-II	Skill	3

UNIT – 1 TYPES OF SERVICE AND MENUS: Table Service- French, Russian, English, merican, Silver, Assisted service-carvery, Buffet, Self-service-, cafeteria, Specialized service- gueridon, automated, tray, trolley etc

UNIT – 2 MENU PLANNING: Introduction, Types of menus, Rules to be observed while planning menus, Classical French Menu - 13 courses, Menu Terms, Food and its accompaniments with cover, Menu Design

UNIT - 3 BREAK FAST: Types – Continental, English, Buffet, Indian, Menu, Cover set up and service

UNIT - 4 IN ROOM DINING AND BUFFET: Hierarchy, Layout and design, Cycle of Service, Forms and formats- RSOT control sheet, Waiter’s card, Breakfast Door Knob, Amenity Voucher, Types of Buffet services – Finger, Fork, sit down, Types of Buffet – Themes, Equipment

UNIT – 5 FUNCTION CATERING: Types of functions, Banquet menu, Table and seating plans, Booking procedure with forms and formats- BFC, Booking Diary, Function of the Day,, Banquet seating calculation

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Define in various types of table service including French, Russian, English, and American, as well as assisted, buffet, and specialized services.

CO2 Understanding menu planning, understanding menu types, rules, classical French menu, terms, accompaniments, and design principles for effective presentation.

CO3 Classify the Continental, English, Buffet, Indian, Menu, Cover set up and service

CO4 Understanding in room dining and buffet services, including hierarchy, layout, cycle of service, forms, buffet types, and equipment usage.

CO5 Understanding function types, banquet menu, seating plans, booking procedures, and calculations for efficient event catering.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	3	3	2	2	2	3	3
CO 2	3	2	3	3	2	2	2	3	3
CO 3	3	3	2	2	2	2	2	2	3
CO 4	3	3	2	3	2	2	2	3	3
CO 5	3	2	2	3	2	2	2	2	3

Code	Subject	Category	Credit
BVHOM-203	Front Office Operations-II	Skill	2

UNIT – 1 LOBBY: Layout of a lobby, Concept of Uniformed Services & it's function, Job description and specification – Concierge, Bell Captain, Bell Boy, Doorman & Parking Valet

UNIT – 2 BELL DESK OPERATIONS: Layout & equipment of Bell Desk, Luggage handling Procedure on guest arrival – FIT, VIP, and Group, Luggage handling Procedure on guest Departure – FIT, VIP, and Group, Left Luggage procedure, Scanty Baggage procedure

UNIT – 3 RESERVATION CONCEPTS: Sources and modes, Types – Guaranteed & non- guaranteed, Reservation Record, Method of receiving a reservation, Handling special requests.

UNIT – 4 RESERVATION PROCESS: Confirmation of reservation, Modification of reservation, Cancellation of reservation, Reservation Charts, Records and forms used, Job description and specification – Reservation Assistant

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand lobby layout, uniformed services' concept, and job roles such as concierge, bell captain, bell boy, doorman, and parking valet.

CO2 Understand bell desk layout, equipment, and procedures for luggage handling on guest arrival, departure, left luggage, and scanty baggage.

CO3 Understand reservation sources, types, records, receiving methods, and handling special requests for efficient booking management.

CO4 Demonstrate proficiency in confirming, modifying, and canceling reservations, managing reservation charts, records, and forms, and understanding Reservation Assistant roles.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	2	3	3
CO 2	3	3	3	3	3	2	2	3	3
CO 3	3	3	2	3	2	2	2	3	3
CO 4	3	3	2	3	2	2	2	3	3

Code	Subject	Category	Credit
BVHOM-204	Housekeeping Operations-II	Skill	2

UNIT – 1 CLEANING EQUIPMENTS: Types of equipment's, Operating principles of equipment's, Characteristics of good equipment (Mechanical, manual), Storage, upkeep, maintenance of equipment.

UNIT – 2 HOUSE KEEPING CONTROL DESK: Importance, role, co-ordination, checklist, Forms, formats & registers used in the desk reports, Role of computers, snapshots of software, Lost & found, Key control, Gate pass, Indenting from stores

UNIT – 3 LINEN, UNIFORM: Lay out, Types of linen, sizes, linen exchange procedures, Storage facilities and conditions, Par stock. (Introduction & definition), Discard procedure, use of discard

UNIT - 4 TAILOR ROOM: Inventory system, Functions of uniform room, Functions of tailor room

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding various cleaning equipment types, operating principles, characteristics, and maintenance procedures for effective cleaning operations.

CO2 Demonstrate proficiency in control desk importance, coordination, checklist usage, forms, computer role, lost & found, key control, and indenting.

CO3 Understanding linen and uniform management, including layout, types, sizes, storage, and discard procedures.

CO4 Understanding expertise in inventory management and tailor room functions for efficient uniform management.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	3	2	2	3	3
CO 2	3	2	3	3	3	2	2	3	2
CO 3	3	2	2	3	2	3	2	3	3
CO 4	3	2	2	3	2	2	2	3	2

Code	Subject	Category	Credit
BVHOM-205	Basics of Event Management	General	6

UNIT - 1 Introduction to Event Management: Defining an event. Importance & scope of events, Size & type of Events, Advantages offered by events

UNIT - 2 Team Organization & Work Distribution: Event Team, Code of ethics, Supervising skills, Management skills, Distribution of responsibilities.

UNIT – 3 Key Elements of Events: Core concept, Core People, Core Talent, Core Structure, Event Infrastructure, Main infrastructure & facilities.

UNIT - 4 Event planning: Role of an event planner, Qualities of a good event planner, Aim of event. Develop a map, Establish objectives, Preparing event proposal, Use of planning tools, Legal formalities & permission from competent authorities, Cost estimation.

UNIT - 5 Promotion & Media: Purpose of Promotion, Use of Different Media- print, networking, TV, Radio, Internet, outdoor media etc, Sponsorships, Factors to make promotions effective, Organizing, Staffing, Systematic supervision to ensure proper distribution and discharge of duties, Leading, Coordination, Controlling, Firefighting skill, Putting things back to the place.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 understanding of defining events, their importance, scope, size, types, and advantages offered for effective event management.

CO2 Understand event team dynamics, ethics, supervisory, and management skills, ensuring effective distribution of responsibilities for success.

CO3 Understand key elements of events: concept, people, talent, structure, infrastructure, and main facilities for successful event execution.

CO4 Understand event planning: role & qualities of a planner, aim definition, mapping, objectives, proposal, tools, legalities, and cost estimation.

CO5 Demonstrate proficiency in promotion's purpose, media usage, sponsorships, effective factors, organizing, staffing, supervision, leadership, coordination, control, and problem-solving.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	2	2	3	3	2	2	3	3
CO 2	3	2	3	3	3	2	2	3	3
CO 3	3	2	2	3	2	2	2	3	3
CO 4	3	2	2	3	2	2	2	3	3
CO5	3	3	3	3	2	2	2	3	3

Code	Subject	Category	Credit
BVHOM-206	Business Communications	General	6

UNIT - 1 INTRODUCTION: Nature and Scope of Business Communication, Principles of Effective Communication (7Cs of communication), Process of Communication, Barriers to Communication and ways to overcome them.

UNIT - 2 ORAL COMMUNICATION: Listening: Process of Listening, Types of Listening, Barriers to Listening Making Effective Presentations, Elements of a Presentation, Format of a good Presentation, Preparation of Visual aids, Handouts and feedback forms, Meetings: Purpose of Meetings, Types of Meetings, Conducting Meetings.

UNIT - 3 WRITTEN COMMUNICATION: Structures and Layout of Business Letters, Writing E- mails, Memorandums, Notices and Circular. Reports: Essentials of Good Reports, Types of Reports, Report writing process.

UNIT - 4 NON-VERBAL COMMUNICATIONS: Importance of Non-Verbal communication, Classification of Non –Verbal Communication: Kinesics, Proxemics, Time language, Paralanguage, Sign language

UNIT - 5 GROUP DISCUSSIONS: (Do’s and Don’ts, Guidelines to succeed in a G.D), Extempore, Debates

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand business communication's nature, scope, principles (7Cs), process, barriers, and strategies for overcoming them.

CO2 Define in listening process, effective presentations, meeting purposes/types, and conducting meetings efficiently with feedback mechanisms.

CO3 Understanding structures of business letters, writing emails, memorandums, notices, circulars, and report essentials, types, and writing processes.

CO4 Understanding of non-verbal communication's significance and its classifications: Kinesics, Proxemics, Time language, Paralanguage, and Sign language.

CO5 Understanding in group discussions with dos and don'ts, guidelines for success, extempore speaking, and debate skills.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	2	3	3
CO 2	3	3	3	3	3	2	2	3	3
CO 3	3	3	2	3	3	2	2	3	3
CO 4	3	3	2	3	3	2	2	3	3
CO5	3	3	3	3	3	2	2	3	3

Code	Subject	Category	Credit
BVHOMP-207	Vocational Practical-II with Internship	Skill	8

- Methods of cooking

- Preparations of Stock
- Preparations of Basic Mother Sauces
- Preparations of Soups
- Preparation of marinades, masalas, pastes and gravies
- Cover Set up, Service sequence, clearance\ Silver service, Pre-plated service
- Compiling of a menu in French
- Breakfast cover setup
- Service of non-alcoholic beverages Room service tray set ups
- Room service tray setup
- Setting up of a BFC and making a bill

Countries, capitals, currencies and official airlines of the world (assignment) Luggage handling

– FIT, walk-in, scanty baggage, regular, crew and group guest. Reservations.

- Taking down a reservation for FIT, FFIT, Corporate guest and group
- Special requests
- Amendment of reservation
- Cancellation of reservation
- Applying Brasso.
- Bed making – traditional
- Glass cleaning tasks – mirror, glass, window pane
 - Sweeping, Scrubbing and Mopping
 - Wet and Dry dusting
 - High ceiling cleaning – cobwebs
- Demonstration of Public area cleaning – Restaurant
- Demonstration of Public area cleaning - Offices, corridors
- Forms and formats – occupancy slip, gate passes, job order, lost and found register, key register

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Explain the cooking methods, stock preparation, basic mother sauces, soups, and marinades, masalas, pastes, and gravies.

CO2 Understanding in cover setup, service sequence, silver service, menu compilation, breakfast setup, room service, and billing.

CO3 Understanding in countries, capitals, currencies, official airlines, luggage handling, reservations, special requests, amendments, cancellations, and cleaning tasks.

CO4 Define how to public area cleaning for restaurants, offices, corridors, and utilize forms like occupancy slips, gate passes, job orders, and registers.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	2	2	3	2	2
CO 2	3	2	2	2	2	2	3	2	3
CO 3	3	2	2	3	2	3	3	2	3
CO 4	3	2	2	2	2	3	2	2	3

BVOC (HOTEL MANAGEMENT) IIIrd Sem

Code	Subject	Category	Credit
BVHOM-301	Food Production – III	Skill	3

UNIT - 1 **FOOD PRESERVATION:** Methods of Food Preservation, Physical and chemical agents in food preservation, Preservation of perishable foods

UNIT - 2 **CHEESE:** Manufacturing process, Types of cheese according to texture, Uses of cheese in cookery, Famous cheese of the world

UNIT - 3 **BAKERY:** Role of Ingredients in Baking, Types of Dough-bread,

UNIT - 4 **Breads:** Names and description of Breakfast, Lunch, Snacks and International breads, Glossary of Bakery Terms

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 To ability knowledge of food preservation methods, physical and chemical agents, and preservation of perishable foods.

CO2 Understand cheese manufacturing, texture-based classification, culinary uses, and renowned global varieties.

CO3 Understand insight into ingredient roles in baking, various types of dough, particularly in bread making.

CO4 Understand about different types of bread, including breakfast, lunch, snacks, and international varieties, along with bakery terminology.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	2	3	3
CO 2	3	3	3	3	3	2	2	3	3
CO 3	3	3	2	3	2	2	2	3	3
CO 4	3	3	2	3	2	2	2	3	3

Code	Subject	Category	Credit
BVHOM-302	Food and Beverage Services – III	Skill	3

UNIT -1 NON-ALCOHOLIC BEVERAGES: Classification, Hot Beverages – Tea, Coffee, Cocoa - production, types, brand names and service, Cold Beverages – waters, juices, milk based, syrups, squashes, aerated – types, brands and service.

UNIT - 2 ALCOHOLIC BEVERAGES: Consumption – Benefits, abuse, sensible drinking, Introduction and classification of alcoholic beverages

UNIT - 3 WINE: Vine – family, grape composition, training and pruning, cycle of harvest, factors affecting quality – soil, climate, viticulture, vinification, vine diseases, Classification of wines – still, sparkling, fortified, aromatized, Control of Quality – France, Italy, German, Grape varieties – 10 red and 10 white, Wine service temperatures.

UNIT - 4 WINE & FOOD HARMONY: Wine manufacture – red, white, rose, Wine producing countries and regions (handout provided) - France, Italy, Germany, Wine names – France, Italy, Germany, California, Australia, India, Champagne
– Introduction, manufacture, types and shippers, Fortified wines – Sherry, Port, Madeira - types, manufacture, service and brands, Aromatised – Vermouth and other aromatized wines

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand non-alcoholic beverages classification, production, types, brands, and service, including hot and cold beverages.

CO2 Understand about the consumption, benefits, abuse, and sensible drinking of alcoholic beverages, along with their classification.

CO3 Understand insight into wine production, grape composition, viticulture, vinification, classification, quality control, and serving temperatures.

CO4 Describe the wine and food harmony, wine manufacturing, producing countries, wine names, champagne, fortified wines, and aromatized wines.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	2
CO 3	3	3	3	3	3	3	3	2	2
CO 4	3	3	3	3	3	3	3	3	3

Code	Subject	Category	Credit
BVHOM-303	Front Office Operation – III	Skill	2

UNIT - 1 RESERVATION OPERATIONS: Reservations and sales, Reservation inquiry – CRS, Intersell Agencies, GDS, Internet and Property Direct. Group Reservations, Reservation reports

UNIT - 2 FRONT DESK OPERATIONS: Information, Role of Information, Handling of mails, registered posts, parcels etc. Handling of messages, Handling of guest room keys. Paging, Providing information to the guest. Aids used in Information section,

UNIT - 3 RECEPTION: Introduction to reception, Coordination between FO and other departments Types of keys and their control, Room change procedure, Preparation of expected arrival & Departure Reports Preparation of other documents, Preparation of Guest History Card, Arrival procedure – FIT,

FFIT, Walk-in, Scanty Baggage, Corporate guest & Group, Departure procedure – FIT, FFIT, Walk-in, Scanty Baggage, Corporate guest & Group Records and forms used, Job description and specification – Receptionist.

UNIT - 4 TELEPHONE: Role of telephone Department Staff organization, Telephone etiquette Records and forms used, Special features for hotels – HOBIC, CAS etc. Types of calls

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand manage reservations and sales via CRS, Intersell, GDS, Internet, Direct, Group Reservations, and generate insightful reservation reports.

CO2 To Ability manage front desk operations including mail, parcels, messages, keys, paging, and guest information with aids.

CO3 Efficiently handle reception tasks, coordinate with departments, manage keys, room changes, reports, documents, arrivals, departures, records.

CO4 Understanding telephone department roles, staff organization, etiquette, records, hotel-specific features (HOBIC, CAS), and various call types.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	3	3
CO 2	3	3	3	3	3	3	2	3	3
CO 3	3	3	3	3	2	3	2	3	3
CO 4	3	3	3	3	2	3	2	3	3

Code	Subject	Category	Credit
BVHOM-304	Housekeeping Operations-III	Skill	2

UNIT - 1 INTERIOR DECORATION, Introduction Definition Design, Elements of Design Principles of Design

UNIT - 2 COLOR AND LIGHT, Introduction Color wheel Importance, Classification characteristics Color Schemes, Layout of room lighting plan Types, classification, Sources Uses

UNIT - 3 FURNITURE AND FURNISHINGS, Introduction Types of Furniture

Types of Joints, Principles of furniture arrangement, Styles of furniture – Chippendale, Victorian, French, Royal, Contemporary, Oriental, Scandinavian, Types of furnishings Use of furnishings Care of furnishings

UNIT - 4 WALL COVERINGS AND FLOOR FINISHES, Types – Paints, fabric, wood, plastic, tiles, wall paper. Selection of wall coverings, Care of wall coverings, Types of Windows – 10 types, Window treatment – stiff (blinds, shutters, shades, screens), soft (curtains, swags, valances) Types of floor finishes (hard – granite, marble, tile, semi hard – rubber linoleum, cork, wood, Soft-carpet and types of carpets, rugs, dhurries), Selection, advantages, disadvantages, care and cleaning

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand interior decoration: introduction, definition, design elements, principles succinctly.

CO2 Understand color and light: understand color wheel, schemes, room lighting, sources, and uses effectively.

CO3 Efficiently grasp furniture and furnishings: types, joints, arrangement principles, styles, care, and usage effectively.

CO4 Understand wall coverings, floor finishes: types, selection, care, windows, treatments, advantages, disadvantages, and maintenance effectively.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	3	2	3	3
CO 2	3	3	2	3	3	2	2	3	3
CO 3	3	3	3	3	2	2	2	3	3
CO 4	3	3	3	3	2	3	2	3	3

Code	Subject	Category	Credit
BVHOM-305	Ethical, Legal & Regulatory Aspects of Hotel	General	6

	Industry		
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UNIT - 1 THE INDIAN CONTRACT ACT, Definition of Contract – essential elements of a valid contract – classification of contracts – voidable contract – void contract – illegal agreement – express contract – implied contract – executed contract – executable contract – warranties, Contractual relationship: Advance Booking/ hotel reservation – terms and conditions – laws relating to registration of guest – Infectious diseases – Hotel Register – Guests in residence – Death at the hotels – Guests causing disturbance – Property lost and found – Animal – Price display – Overbooking – Breach of contract – Registered letters – Damage to property – service charge – Settlement of payments – Guests who have left.

UNIT - 2 HOTEL LICENSES AND PERMITS, Licenses and permits, Liquor licensing laws – Licensed premises – General permitted hours – Quantities and measures
 – Billiards and similar games – Music and dancing licenses – Performing right – Late night refreshment house – Tobacco and cigars – Betting, gaming and gaming machines – copyrights

UNIT - 3 FOOD LEGISLATION, Prevention of Food Adulteration Act: – Objectives – definition - Adulterated and Misbranded Food - Provisions- Appointment and Powers of Food Inspector under the act - procedure for taking a sample

UNIT - 4 CONSUMER PROTECTION ACT, Definitions - Consumer protection councils - procedure for redressal of grievances

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding Indian Contract Act: contract definition, elements, classification, terms, guest laws, breach resolution, settlement, efficiently.

CO2 Understanding navigate hotel licenses and permits including liquor, gaming, music, tobacco, copyrights, and regulatory compliance effectively.

CO3 Understanding food legislation: understand objectives, definitions, provisions, food inspection, and sampling procedures effectively.

CO4 Efficiently grasp Consumer Protection Act: understand definitions, councils, and grievance redressal procedures for consumer protection.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	3	3	3	2	3	3
CO 2	3	3	3	3	3	2	2	3	3
CO 3	3	3	3	3	2	2	2	3	3
CO 4	3	3	3	3	2	3	2	3	3

Code	Subject	Category	Credit
BVHOM-306	Basic of Hotel Accountancy	General	6

UNIT - 1 DOUBLE ENTRY BOOK KEEPING, Meaning of Book-keeping and Double Entry Book- keeping, Meaning of Accounting, Objectives, Advantages, Users of Accounting Information and Relationship with other disciplines, Accounting Concepts and Conventions

UNIT - 2 JOURNAL AND LEDGER, Meaning, Advantages and Limitations, Classification of Accounts – personal, real and nominal, rules for debiting and crediting Journalizing – simple and compound entries, Posting from journal to ledger, balancing of accounts & preparation of Trial balance.

UNIT - 3 SUBSIDIARY BOOKS, Meaning, objectives, Advantages and Limitations, Types of subsidiary books - Purchase Book, Purchase Returns Book, Sales Book, Sales Returns Book, Cash Book – Simple and three columnar - Petty Cash Book

UNIT - 4 FINAL ACCOUNTS, Meaning, Objectives, Advantages and limitations Trading and Profit and Loss Account, Balance Sheet Types of assets and liabilities, Income Statement and Balance Sheet and Schedules (Simple problems without adjustments)

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding double entry bookkeeping: grasp meanings, objectives, advantages, users, concepts, and conventions effectively.

CO2 Understanding handle journal and ledger: understand meanings, classifications, rules, journalizing, posting, balancing, and trial balance preparation.

CO3 Understanding subsidiary books: understand meanings, objectives, advantages, limitations, and types like purchase, sales, cash, and petty cash books effectively.

CO4 Understanding manage final accounts: understand meanings, objectives, advantages, limitations, and types like trading, profit and loss, balance sheets, assets, liabilities, income statements, and simple schedules.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	3	2	3	3
CO 2	3	3	2	3	3	2	2	3	3
CO 3	3	3	2	3	2	2	3	3	3
CO 4	3	3	2	3	2	3	3	3	3

Code	Subject	Category	Credit
BVHOMP-307	Vocational practical- III	Skill	8

- Demonstration of Breakfast, Lunch, Snack items and International breads Demonstration of pancakes
- Service of non-alcoholic beverages
- Reading of the wine maps of France, Italy, Germany
- Reading of wine labels
- Service of Still wines
- Service of Sparkling wines
- Service of fortified, aromatized wines
- Matching food and wine
- Handling messages,
- Handling keys
- Providing information to the guest
- Handling group reservations
- Handling registration – FIT, FFIT, VIP/Regular, Corporate, Group/crew guest Security
- Deposit Box handling,

- Credit Card Handling procedure,
 - Foreign Currency exchange procedure
 - Bed making with turn down and foot fold (single sheet covering and duvet)
Planning a colorscheme of a room based on different schemes
 - Interior design – analyzing a picture with respect to elements of interior design
Setting of ChamberMaid’s Trolley – all supplies provided
 - Sewing tasks
-

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Efficiently demonstrate breakfast, lunch, snacks, international breads, pancakes, non-alcoholic beverages, read wine maps/labels, and provide service for still wines.

CO2 Demonstrate Proficiently serve sparkling wines, fortified and aromatized wines, match food with wine, handle messages/keys, provide guest information, and manage group reservations.

CO3 Apply knowledge to skill handle registration for FIT, FFIT, VIP/Regular, Corporate, Group/crew guests, security, deposit boxes, credit cards, and foreign currency exchange.

CO4 Define the bed making, color scheme planning, interior design analysis, chambermaid's trolley setup, and sewing tasks efficiently.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	3	2	3	3
CO 2	3	3	2	2	3	2	2	3	3
CO 3	3	3	2	3	2	2	2	3	3
CO 4	3	3	2	3	2	3	2	3	3

BVOC (HOTEL MANAGEMENT)
IVth Sem

Code	Subject	Category	Credit
BVHOM-401	Food Production-IV	Skill	3

UNIT - 1 MENU PLANNING: Principles of menu planning, Types of menus, Names and description of popular national and international dishes

UNIT - 2 PASTRY: Pastry, Puff pastry, flaky pastry, short crust pastry-(sweet and savoury), choux pastry, Types of Sponge cakes, Types of Gateaux,

UNIT - 3 ICING AND DESSERTS: Types of Icing- Fondant, fresh cream, butter cream, American frosting, royal, truffle, ganache, Types of desserts-hot and cold desserts, Petits fours- Definition and examples

UNIT - 4 FOOD STANDARDS: Importance, WHO standards-voluntary and compulsory standards, Common adulterants and their detection, Classification of additives and their role, Mislabeling

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding grasp menu planning principles, menu types, and names/descriptions of popular national and international dishes.

CO2 Understanding the knowledge of produce pastry variations including puff, flaky, shortcrust (sweet/savory), choux, sponge cakes, and gateaux types with mastery and precision.

CO3 Apply the icing techniques: fondant, fresh cream, buttercream, frostings, truffle, ganache; create hot/cold desserts, petits fours with precision, creativity, and finesse.

CO4 understanding the food standards' importance, WHO standards (voluntary/compulsory), detect adulterants, classify additives, and identify mislabeling to ensure food safety.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	2	3	3	2	3	3
CO 2	3	3	2	2	3	2	2	3	3
CO 3	3	3	2	2	2	2	2	3	3
CO 4	3	3	2	2	2	3	2	3	3

Code	Subject	Category	Credit
BVHOM-402	Food and Beverage Services-IV	Skill	3

UNIT - 1 BEER AND OTHER FERMENTED BEVERAGES: Introduction to Beer, Ingredients for Beer Manufacture, Production of Beer, Beer classification and styles, Service of Beer, Beer brands with countries – 10 countries with 5 brands each, Cider, Sake, Toddy

UNIT - 2 ALCOHOLIC BEVERAGES: Introduction, Effect of alcohol on health Classification of alcoholic beverages Pot still distillation, Patents still distillation Proof systems,

UNIT - 3 WHISKY, RUM AND GIN: Whisky, Scotch - manufacturing, types, regions, brands Irish – history, manufacture, brands, American – history, manufacture, types, brands Brand names – Canadian, Indian, Brandy, History, Cognac - Manufacturing, region, types, brands, Other brandies – Armagnac, Marc/Grappa, Calvados – basic knowledge, Rum, History, Manufacture, Styles, Brand names with countries, Gin.

UNIT - 4 VODKA AND TEQUILA: History, Manufacture, Types, Brand names with countries, Vodka, History, Manufacture, Brand names with countries, flavoured vodkas, Tequila, History, Manufacture, Styles, Brand names

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand beer history, ingredients, production, classification, service; explore global brands; learn about cider, sake, toddy, and other fermented beverages.

CO2 Examine alcohol's health effects, classify beverages, study pot still and patent still distillation, and understand proof systems.

CO3 Define whisky (Scotch, Irish, American), brandy (Cognac, Armagnac), rum (history, manufacture, styles), gin, and brand names globally.

CO4 Understanding the vodka (history, manufacture, flavored variants, global brands) and tequila (history, production methods, styles, international brand exploration).

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	3	2	3	3
CO 2	3	3	2	3	3	3	2	3	3

CO 3	3	3	2	3	2	2	2	3	3
CO 4	3	3	2	3	2	3	2	3	3

Code	Subject	Category	Credit
BVHOM-403	Front Office Operations-IV	Skill	2

UNIT – 1 REGISTRATION, Objectives, Legal obligations, Pre-registration, Registration procedure – FIT, FFIT, Walk-in, Scanty Baggage, VIP, Crew and Group guests, When guests cannot be accommodated – Walk-in Guests, guests with non-guaranteed reservations and guests with guaranteed reservations., Reports, Records and forms used, Equipment

UNIT - 2 FO CASH AND ACCOUNTING, Role of FO Cash section at stages of the guest cycle, Job description of FOC, Departure procedure - FIT, FFIT, Walk- in, Scanty Baggage, VIP, Crew and Group guests, Security Deposit Box handling, Credit Card Handling procedure, Foreign Currency exchange procedure, Reports, Records and forms used, Equipment.

UNIT – 3 ACCOUNTING FUNCTION: Accounting Fundamentals – Accounts, folios, vouchers, POS, ledgers, FO accounting cycle, Creation and maintenance of accounts, Guest and non- guest accounts, Accounting system – non automated, semi-automated and fully automated

UNIT - 4 FRONT OFFICE AND GUEST SAFETY AND SECURITY, Importance of security system, Safe Deposit, Key Control, Emergency situations – accident, illness, theft, fire, bomb threat etc.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand hotel registration processes, legal obligations, pre-registration methods, handle various guest scenarios, manage reports, records, and necessary equipment.

CO2 Understanding Front Office Cash section's role in guest cycle, job responsibilities, departure procedures, security deposit handling, credit card, currency exchange, and related documentation.

CO3 Define the accounting basics, including accounts, vouchers, ledgers, with focus on guest and non-guest accounts, and system automation levels.

CO4 Understand security's significance, safe deposit, key control, and procedures for various emergencies like accidents, illness, theft, fire, and bomb threats.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	3	2	3	3
CO 2	3	3	2	3	3	3	2	3	3
CO 3	3	3	2	3	3	3	2	3	3
CO 4	3	3	2	3	3	3	2	3	3

Code	Subject	Category	Credit
BVHOM-404	Housekeeping Operations-IV	Skill	2

UNIT -1 HORTICULTURE: Indoor and outdoor plants – five each, Care and upkeep, Bonsai, Landscaping,

UNIT -2 FLOWER ARRANGEMENTS: Identification of flowers, Types of arrangements, Principles of arrangement, Arrangements by location, Points to be remembered.

UNIT -3 CLEANING SCIENCE: Cleaning principles, PH scale and cleaning agent with their application, Types of cleaning agents, Cleaning products – hotel specific, Characteristics of good cleaning agent

UNIT -4 SUPERVISION IN HOUSEKEEPING: Role of a supervisor (Desk, Public Area, Floor, Linen, Uniform, Laundry), Supervisors Check list, Guest complaints & Guest complaint handling, VIP Room Checking, Leave handling procedures

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Identify, care for indoor/outdoor plants, master bonsai techniques, and learn principles of landscaping for aesthetic environments.

CO2 Recognize flowers, learn arrangement types and principles, create location- specific arrangements, and grasp essential points for successful arrangements.

CO3 Identify the cleaning principles, pH scale, agent types, hotel-specific products, and qualities of effective cleaning agents.

CO4 Understand supervisor roles across housekeeping areas, utilize checklists, address guest complaints, conduct VIP room checks, and manage leave procedures.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	2	3	3
CO 2	3	3	3	3	3	2	2	3	3
CO 3	3	3	2	3	3	2	2	3	3
CO 4	3	3	2	3	3	2	2	3	3

Code	Subject	Category	Credit
BVHOM-405	Hospitality Marketing	General	6

UNIT - 1 INTRODUCTION TO HOSPITALITY MARKETING, Meaning and

definition - Nature and Scope - Feature / Characteristics - Concepts of Marketing, Customer Expectations from hospitality services - Solving Customers problems, Relevance of Sales & marketing in the Hospitality Industry.

UNIT - 2 HOSPITALITY MARKETING MIX, Meaning and Definition of Marketing Mix, PRODUCT / SERVICE MIX, Elements /Components, Difference between goods and services Product life Cycle, Stages of New product/ service development, PRICE MIX, Factors influencing pricing methods and strategies, PROMOTION MIX, Objectives of promotion Elements of promotions mix, Advertising, sales, promotion, personal selling, publicity, public relations, PLACE MIX, Distribution channels/channel intermediaries, PEOPLE, Elements of People mix, Role of Employees and Internal Marketing Role of customers and Relationship Marketing

UNIT – 3 THE MARKETING ENVIRONMENT, The importance of Environmental scanning - Types of Environments, SWOT Analysis, The Future of Hospitality Marketing in India

UNIT - 4 MARKETING SEGMENTATION, TARGETING AND POSITIONING,

Meaning, Importance and Basis of Market Segmentation, Essentials of sound market segmentation, STP Strategy- Segmentation, Targeting & Positioning strategies

UNIT - 5 CONSUMER BEHAVIOUR IN HOTEL INDUSTRY, Factors influencing

Consumer behavior, Buying decision process

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understanding the hospitality marketing fundamentals, understand customer expectations, problem-solving, and appreciate the significance of sales and marketing in hospitality.

CO2 Understand hospitality marketing mix components (product, price, promotion, place, people), their intricacies, and significance in relationship marketing strategies.

CO3 Recognize importance of environmental scanning, understand types of environments, conduct SWOT analysis, and predict future trends in Indian hospitality marketing.

CO4 Understand market segmentation fundamentals, essential criteria, and STP strategies for effective segmentation, targeting, and positioning in marketing.

CO5 Understand factors shaping consumer behavior in hotels, analyze the buying decision process, and its implications for the industry.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	3	2	3	3
CO 2	3	3	2	3	3	3	2	3	3
CO 3	3	3	2	3	3	3	2	3	3
CO 4	3	3	2	3	3	3	2	3	3
CO5	3	3	2	3	3	3	2	3	3

Code	Subject	Category	Credit
BVHOM-406	Allied Hospitality Management	General	6

UNIT - 1 RETAIL MANAGEMENT, The Retail Environment, Retail Operations, Systems & Inventory, Retail Advertising and Promotion, Retail Supply Chain Management

UNIT - 2 FACILITIES MANAGEMENT, Introduction to Facility Management – Areas of control, Housekeeping-Area cleaning, Pest Control, Horticulture, Vendor Management, Inventory, Engineering – Equipment maintenance, Energy Saving measures, Procurement & Finance, Miscellaneous – Security, Front Office, Training, Events

UNIT - 3 EVENT MANAGEMENT, Role of events for promotion of tourism, Types of Events- Cultural, festivals, religious, business etc., Need of event management, Key factors for best event management., Case study of some cultural events

UNIT – 4 MICE, Concept of MICE., Introduction of meetings, incentives, conference/conventions, and exhibitions., Definition of conference and the components of the conference market., The nature of conference markets and demand for conference facilities., The impact of conventions on local and national communities

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Recognize retail environment, operations, inventory systems, advertising, promotion, and supply chain management strategies for effective retail management practices.

CO2 Describe the facility management areas, including housekeeping, pest control, horticulture, vendor and inventory management, engineering, procurement, finance, security, front office, training, and events.

CO3 Understand events' role in tourism promotion, types (cultural, festivals, business), necessity, key factors, and cultural event case studies.

CO4 Define the MICE concept, understand meetings, incentives, conferences, exhibitions, conference market components, demand, and conventions' impact on communities.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	3	2	3	3
CO 2	3	3	2	3	3	3	2	3	3
CO 3	3	3	2	3	3	3	2	3	3

CO 4	3	3	2	3	3	3	2	3	3
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Code	Subject	Category	Credit
BVHOMP-407	Vocational Practical-IV with Internship	Skill	8

- Punjabi cuisine
- Awadhi cuisine
- Bengali cuisine
- Hyderabadi cuisine
- Chettinad cuisine
- Goan cuisine
- Kerala cuisine
- Service of beer
- Service of spirits and liqueurs.
- Preparation of popular Cocktails
- Calculation of room occupancy percentages and room position
- Preparation of a guest folio
- Check-out procedure PMS activities
- Feeding a reservation
- Amendment, Cancellation and Reinstating a reservation, Feeding messages
- Check in guest
- Room and rate assignment, Room change
- Emergency situation Handling Fire Death
- Natural Disasters – Floods, earthquake, epidemics, etc.
- Accident, Lost & Found, Damage to Hotel property. Vandalism, Drunk Guest, Scanty Baggage Theft, Sick Guests
- Bomb and Terrorism Threats
- Flower arrangement (circular, horizontal, triangular, vertical, one sided triangular, ikebana)

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Recognize Punjabi, Awadhi, Bengali, Hyderabadi, Chettinad, Goan, and Kerala cuisines, including ingredients, cooking techniques, and cultural significance.

CO2 Understand the beer and spirits service, popular cocktails preparation, room occupancy calculation, guest folio preparation, check-out procedure, and reservation handling.

CO3 To Understand the reservation management tasks like amending, cancelling, reinstating reservations, message handling, check-in procedures, room assignment, room changes, emergency handling, Drunk guest and sick guests.

CO4 Classify the various flower arrangement styles including circular, horizontal, triangular, vertical, one-sided triangular, and ikebana techniques.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	2	3	3
CO 2	3	3	3	3	3	2	2	3	3
CO 3	3	3	2	3	3	2	2	3	3
CO 4	3	3	2	3	3	2	2	3	3

BVOC (HOTEL MANAGEMENT)

Vth Sem

Code	Subject	Category	Credit
BVHOM-501	Food Production-V	Skill	3

UNIT - 1 FRENCH CUISINE, Features, regional classification, ingredients, methods of cooking, courses of the menu, Glossary of French Culinary Terms

UNIT - 2 ITALIAN CUISINE, Features, regional classification, ingredients, methods of cooking, courses of the menu, Glossary of Italian Culinary Terms

UNIT – 3 SPANISH /MEXICAN CUISINE, Features, regional classification, ingredients, methods of cooking, courses of the menu, Glossary of Spanish/Mexican Culinary Terms

UNIT - 4 ORIENTAL CUISINE, Chinese-Features, regional classification, ingredients, methods of cooking, courses of the Menu, Thai-Features, regional classification, ingredients, methods of cooking, courses of the Menu, Japanese- Features, regional classification, ingredients, methods of cooking, courses of the Menu

UNIT - 5 KITCHEN ORGANIZATION AND HUMAN RESOURCE, The classical kitchen brigade-the partie system, Job description and job specification of executive chef, chef de partie and commis, Recruitment and selection, Induction, training and development

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand French cuisine's features, regional diversity, ingredients, cooking methods, menu courses, and key culinary terms.

CO2 Define the Italian cuisine's features, regional variations, ingredients, cooking methods, menu courses, and essential culinary terminology.

CO3 Understand Spanish/Mexican cuisine's features, regional diversity, ingredients, cooking techniques, menu courses, and key culinary terms.

CO4 Identify the Oriental cuisine: Chinese (features, regions, ingredients, cooking methods, menu), Thai (features, regions, ingredients, cooking, menu), Japanese (features, regions, ingredients, cooking, menu).

CO5 Understand classical kitchen brigade, job roles (executive chef, chef de partie, commis), recruitment, induction, training, and development.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	2	3	3
CO 2	3	3	3	3	3	2	2	3	3
CO 3	3	3	2	3	3	2	2	3	3
CO 4	3	3	2	3	3	2	2	3	3
CO5	3	3	3	3	3	2	2	3	3

Code	Subject	Category	Credit
BVHOM-502	Food and Beverage Services-V	Skill	3

UNIT - 1 OTHER SPIRITS, Absinthe, Ouzo, Slivovitz, Akvavit, Feni, Arrack, Schnapps, Pastis

UNIT - 2 LIQUEURS, Introduction, Manufacture, Brand names with base, color, flavor, countries.

UNIT -3 BAR, Types, Equipment and ingredient

UNIT - 4 COCKTAIL: Introduction, parts (base, modifier etc.), methods (stir, shaken etc.) families (cups, daisies, crustas etc.), terms (dash, zest, on the rocks, naked etc.) popular cocktails (classic, modern.

UNIT – 5 TOBACCO, Health hazards, Cigar – Manufacture, parts, colors, shapes, storage, brands and service

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Define the various spirits like Absinthe, Ouzo, Slivovitz, etc., understanding their characteristics and cultural significance.

CO2 Understand liqueurs, including their manufacture, brands, base, color, flavor, and origin countries.

CO3 Understand about different types of bars, equipment, and ingredients essential for bar operation.

CO4 understand the art of cocktail making, including understanding cocktail parts, methods, families, terms, and popular classic and modern cocktails.

CO5 Understand insights into tobacco, including health hazards, cigar manufacture, parts, colors, shapes, storage, brands, and service etiquette.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	2	3	3
CO 2	3	3	3	3	3	2	2	3	3
CO 3	3	3	3	3	3	2	3	3	3
CO 4	3	3	3	3	3	2	3	3	3
CO5	3	3	3	3	3	2	2	3	3

Code	Subject	Category	Credit
BVHOM-503	Housekeeping Operations-V	Skill	2

UNIT - 1 TEXTILES AND UNIFORM DESIGNING, Fibre (natural, manmade, characteristics, advantage, disadvantages), Weaves (plain, twill, jacquard, damask, satin), Finishing processes, Importance of Uniforms, Types of Uniforms, Characteristics of Uniforms, Selection of Uniforms, Par stock

UNIT - 2 CONTRACT SERVICES – LAUNDRY: Introduction, Contract Services – complete program, Special, periodic, pricing, types, Laundry – layout, types, equipment,

UNIT - 3 CONTRACT SERVICES – PEST CONTROL: Pest control – common pests, eradication, control.

UNIT - 4 REFURBISHMENT, REDECORATION, NEW PROPERTY OPENING,
Definition, Factors involved in refurbishment and redecoration, Procedures & Task involved, Snagging list, Takeover of a new property from projects.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand textiles, including fibers, weaves, finishing processes, and their role in uniform designing. Learn about the importance, types, characteristics, and selection criteria of uniforms, along with maintaining par stock levels.

CO2 Define contract laundry services, including program types, pricing, layouts, equipment, and management.

CO3 Understand contract pest control services, identifying common pests, eradication, and control methods.

CO4 Understand the refurbishment, redecoration, and new property opening processes, including definition, factors, procedures, task management, snagging lists, and property takeover.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	3	2	3	3
CO 2	3	3	2	2	3	2	2	3	3
CO 3	3	3	2	3	2	2	2	3	3
CO 4	3	3	2	3	2	3	2	3	3

Code	Subject	Category	Credit
BVHOM-504	Front Office Operations-V	Skill	2

UNIT - 1 RECEPTION, Day & Night Reception, Preparation of night reports, Calculations, Room selling techniques – Upselling and Discounts

UNIT - 2 HOSPITALITY AND LOBBY DESK, Role of the GRE, Welcome Procedure, Identifying complaints, Complaint Handling, Role of the Lobby Desk, Job Description of the Lobby Manager

UNIT - 3 FRONT OFFICE ACCOUNTING, CHECK-OUT AND SETTLEMENT,

Tracking transaction – cash payment, charge purchase, account correction, account allowance, account transfer, cash advance, Internal control – Cash Bank, Check-out and account settlement, Control of cash and credit, Methods of settlement, Checkout options - Express checkout, self-checkout, Late check- out, Unpaid account balances, Account collection – account aging, Updating FO records, Late Charges

UNIT – 4 THE FRONT OFFICE AUDIT, Role and importance of Night Audit, Job Description of the night auditor, Establishing an End of day, Guest Credit monitoring, Preparation of Transcript, The Front Office audit process

UNIT - 5 COMPUTER APPLICATIONS IN FRONT OFFICE OPERATIONS,

Role of computers, various types of PMS used, Front Office UNITs and it's applications

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand day and night reception duties, night report preparation, calculations, and room selling techniques like upselling and offering discounts.

CO2 Understand the roles of Guest Relations Executives (GREs) and Lobby Desk in hospitality, including welcome procedures, complaint identification and handling, and job descriptions of lobby managers.

CO3 Understanding the front office accounting, check-out, and settlement procedures, including transaction tracking, internal controls, methods of settlement, checkout options, account collection, and front office audit preparation.

CO4 Understand the role and importance of night audit, night auditor job description, end-of-day procedures, guest credit monitoring, transcript preparation, and front office audit processes.

CO5 Describe the computer applications in front office operations, including their role, various Property Management Systems (PMS) used, and their applications in front office units.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	3	2	2	2	3	3	3
CO 2	3	3	3	3	3	3	2	2	3
CO 3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3

Code	Subject	Category	Credit
BVHOM-505	Food & Beverage Controls & Management	General	6

UNIT - 1 AN OVERVIEW OF FOOD AND BEVERAGE MANAGEMENT,

Introduction to Food & beverage management., The hospitality industry and its products, Service standards, Purchase, Inventory, Storage, Role of Purchase department & purchase cycle, S.P.S, Purchase order form, Selection of Supplier, Economic Order Quantity, Concentration of Orders, Kickbacks, Other supplier considerations, Receiving of Food & beverages,

CO 4	3	3	3	3	3	3	3	3	3
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Code	Subject	Category	Credit
BVHOM-506	Hotel Budget & Budgeting	General	6

UNIT – 1 COST CONCEPTS: Introduction – importance - advantages and disadvantages, Types of cost – elements of cost – elements of profit- need for food cost and its analysis, Hotel Cost Sheet, Ingredient Cost Sheet

UNIT - 2 BUDGET: Introduction – meaning – definitions, Types of budgets - advantages and disadvantages, Budgetary control - Introduction – meaning – objectives - advantages and disadvantages

UNIT - 3 MATERIAL CONTROL: Stores Purchase order- stores requisition, Stores ledger – LIFO and FIFO

UNIT - 4 MENU COSTING AND BANQUET COSTING: Meaning and methods, Hubbard’s formula. (Simple problems)

UNIT - 5 BREAK EVEN ANALYSIS: Introduction – meaning, CVP analysis and its application, (Exercises on BEP both in unit and sales, P/V ratio, margin of safety)

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand cost importance, types, elements of profit, hotel cost sheet, ingredient cost sheet, and the need for food cost analysis.

CO2 Understand budget meaning, types, advantages, disadvantages, and budgetary control's objectives, advantages, and disadvantages for effective financial management.

CO3 Understand stores purchase order, requisition, ledger, and inventory valuation methods LIFO and FIFO.

CO4 Understand meaning, methods, and application of Hubbard’s formula through solving simple problems.

CO5 Understand meaning, application, and exercises on Break-even Point (BEP), P/V ratio, and margin of safety.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	2	3	2
CO 2	3	3	2	3	3	2	2	3	2
CO 3	3	3	2	3	3	2	2	3	2
CO 4	3	3	2	3	3	2	2	3	2
CO5	3	3	2	3	3	2	2	3	2

Code	Subject	Category	Credit
BVHOMP-507	Vocational Practical-V	Skill	8

- Demonstrations of basic principles of French cuisine
- Preparation of Puff pastry, short crust pastry-sweet and savoury, choux pastry
- Menus of French, Italian, Thai & Japanese cuisine
- Service of Liqueurs
- Service of cigars & Cigarettes
- **FO situation Handling**
 - Upselling
 - Complaint handling
- **PMS Activities**
 - Posting of charges
 - Transferring folio
 - Splitting folio Checking out guests
 - GLOSSARY

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand basic French cuisine, prepare various pastries, and design menus across French, Italian, Thai, and Japanese cuisine.

CO2 Proficiency in serving liqueurs and cigars, ensuring quality service standards and guest satisfaction in hospitality.

CO3 Understanding in upselling, complaint resolution, PMS activities, charge posting, folio management, guest check-out, and understanding relevant hospitality terminology.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	2	3	3
CO 2	3	3	3	3	3	2	2	3	3
CO 3	3	3	2	3	3	2	2	3	3

BVOC (HOTEL MANAGEMENT) VIth Sem

Course Code	Subject	Category	Credits
BVHOM-601	Garde Manger	Skill	2

UNIT - 1 GARDE MANGER (LARDER WORK) : Salads-Classification, principles of salad making, ingredients used, parts of a salad, salad dressings, garnishes, types of salads, classical salads, Hors d'oeuvres-Classification, examples and accompaniments, sandwiches- composition, types, principles of preparation, classic sandwiches, rules to be followed, and accompaniments. Specialty meats- Farcis, terrines, pates, galantines, ballotines, mousses. Cold sauces- dips, chaudfroids, aspics. Charcuterie-Sausages, bacon and ham

UNIT - 2 ACCOMPANIMENTS AND GARNISHES: Classical vegetable accompaniments, Potato preparations, Garnishes and accompaniments for popular dishes

UNIT - 3 KITCHEN PLANNING: Sections of the kitchen with layout and functions, Production workflow, Planning of Kitchen Spaces, Layout of a large quantity kitchen and satellite kitchen, Planning of Storage Spaces

UNIT - 4 FOOD PRODUCTION SYSTEMS: Principles of large-scale commercial cooking, Rechauffe – effective use of leftovers. Catering systems, Cook Chill Systems-definition, procedure, advantages and disadvantages, Cook Freeze System –definition, procedure, advantages and disadvantages, Sous

Vide- definition, procedure, advantages and disadvantages,

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand salad principles, dressings, garnishes, sandwich composition, classic recipes, hors d'oeuvres, specialty meats, cold sauces, charcuterie.

CO2 Understanding of classical vegetable accompaniments, potato preparations, and garnishing techniques for enhancing the presentation of popular dishes.

CO3 Understanding kitchen sections, workflow, space planning, large quantity and satellite kitchen layouts, and efficient storage space allocation.

CO4 Understand large-scale cooking, rechauffe principles, catering systems, and methods like cook chill, cook freeze, and sous vide, including their procedures and implications.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	3	2	3	2
CO 2	3	3	2	3	3	3	2	3	2
CO 3	3	3	2	3	3	3	2	3	2
CO 4	3	3	2	3	3	3	2	3	2

Course Code	Subject	Category	Credits
BVHOM-602	Bar Management	Skill	2

UNIT - 1 AN OVERVIEW OF BEVERAGE MANAGEMENT: Introduction to beverage management, The hospitality industry and its products, Service standards

UNIT - 2 BAR AND BEVERAGE MANAGEMENT: The legal framework in India – laws, licenses, permitted hours, age restrictions, weights and measures, alcoholic strength, Compiling various wine and drink lists, Inventory, Storage, Sourcing of liquor, Pricing of alcoholic beverages, Bar stock

taking and inventory, Determining stock levels, Standard recipe, costing and pricing of drinks, Bar frauds and best practices, Books and records in bar

UNIT - 3 FACILITY PLANNING AND DESIGN OF SERVICE AREAS: F & B

Function areas, Food service outlets, Lounges and bars, Conference, banqueting and function rooms

UNIT - 4 MANAGEMENT INFORMATION SYSTEM: Reports generated, Analysis of revenue reports, Daily sales report, APC, Cover turnover ratio, P & L statement (food service outlets)

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand the beverage management introduction, hospitality industry products, and service standards.

CO2 Understand the Grasp the legal framework in India, compilation of wine and drink lists, inventory management, pricing strategies, stocktaking, and fraud prevention in bars.

CO3 Understand the Familiarize with F&B function areas, food service outlets, lounges, bars, conference, banqueting, and function rooms.

CO4 Analyze generated reports, revenue analysis, daily sales report, average per customer (APC), cover turnover ratio, and profit and loss (P&L) statement for food service outlets.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	3	2	3	3
CO 2	3	3	2	3	3	3	2	3	3
CO 3	3	3	2	3	2	2	2	3	3
CO 4	3	3	2	3	2	3	2	3	3

Course Code	Subject	Category	Credits
BVHOM-603	Yield Management	Skill	2

UNIT - 1 YIELD MANAGEMENT: Applicability to rooms division. Capacity

Management. Discount allocation, Duration control. Measuring yield. Elements of yield management. Uses of yield management.

UNIT - 2 SECURITY AND LODGING INDUSTRY: Developing the security program. Management role in security. Setting up the security program. Security and law.

UNIT - 3 PLANNING AND EVALUATING FRONT OFFICE OPERATIONS:

Establishing Room rates, Basis of charging, Plans, competition, customer's profile, standards of service and amenities. Hubbart's Formula. Forecasting room availability, Forecasting techniques, Forecasting data, Forecast formula, Sample forecast formula.

UNIT - 4 ACCOMMODATION FACILITY PLANNING: Planning the Front Office Layout, Ergonomics, Lobby layout, Front Desk layout, Bell Desk layout, Back Office layout

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand its applicability to rooms division, capacity management, discount allocation, duration control, measurement, elements, and uses of yield management.

CO2 Develop security programs, understand management roles, set up security programs, and comprehend security laws.

CO3 Establish room rates, understand basis of charging, consider plans, competition, customer profiles, service standards, Hubbart's Formula, and forecasting techniques.

CO4 Understand the Plan front office layout, consider ergonomics, lobby layout, front desk layout, bell desk layout, and back office layout for efficient operations.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	3	2	3	3
CO 2	3	3	2	3	3	3	2	3	3
CO 3	3	3	2	3	2	3	2	3	3
CO 4	3	3	2	3	3	3	2	3	3

Course Code	Subject	Category	Credits
BVHOM-604	Facility Planning and Budgeting of Housekeeping	General	4

UNIT - 1 ACCOMMODATION FACILITY PLANNING: Room dimensions (length, width, height, space management), Facilities and services for disabled guest room. Balconies and terraces, Eva floor, Work ergonomics,

UNIT - 2 BATHROOM: Bathroom layout, Fitting and fixtures, Disabled guest bathroom features.

UNIT - 3 BUDGETING FOR HOUSEKEEPING : Inventory control and stock taking, Types of budgets (operational and capital), Budget preparation, Cost control in specific areas, guest room, public areas, linen room, stores, cleaning, material and supplies, flowers), Purchasing. (Principles involved, stages, types)

UNIT - 4 DAILY ROUTINES AND HOUSEKEEPING PROCEDURES: A day in the life of an Executive Housekeeper, Accommodation Manager, A day in the life of an Assistant Housekeeper, A day in the life of a Floor Supervisor, A day in the life of a Public Area Supervisor, A day in the life of a Desk Housekeeper, A day in the life of a Uniform, Linen Supervisor

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand room dimensions, facilities for disabled guests, balcony and terrace considerations, Eva floor, and work ergonomics.

CO2 Understand bathroom layout, fitting and fixtures, and features for disabled guest bathrooms.

CO3 Define Learn inventory control, types of budgets, budget preparation, cost control strategies in various areas, and principles of purchasing.

CO4 Understanding the daily responsibilities of executive housekeepers, accommodation managers, assistant housekeepers, floor supervisors, public area supervisors, desk housekeepers, uniform, and linen supervisors.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
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CO 1	3	3	2	3	3	2	2	3	3
CO 2	3	3	3	3	3	2	2	3	3
CO 3	3	3	3	3	3	2	3	3	3
CO 4	3	3	3	3	3	2	3	3	3

Course Code	Subject	Category	Credits
BVHOM-605	Ecology of Tourism	General	4

UNIT - 1 The Multi-disciplinary nature of environmental studies (1 lecture),

Definition, Scope and importance, Need for public awareness.

UNIT - 2 Natural Resources:, Renewable and non-renewable resources:, Natural resources and associated problems., Forest resources: Use and over-exploitation. Deforestation, Case studies. Timber extraction, mining, dams and their effects on forests and tribal people., Water resources: use and over utilization of surface and ground water Floods, drought, conflicts over water, dams-benefits and problems., Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources. Case studies., Food resources: world food problems, changes caused by agriculture and over grazing effects of modern agriculture, fertilizer- pesticide problems, water logging salinity. Case studies., Energy resources: growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies., Land resources: land as a resource, land degradation, man induced landslides, soil erosion and desertification., Role of an individual in conservation of natural resources., Equitable use of resources for sustainable lifestyles.

UNIT - 3 Ecosystems, Concept of an ecosystem., Structure and function of an ecosystem., Producers, consumers and decomposers., Energy flow in the ecosystem., Ecological succession., Food chain, food web and ecological pyramids., Introduction types characterized features structure and function of the following ecosystems., Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT - 4 Environmental pollution, Definition, Causes, effects and control measures of:
-, Air pollution, Water pollution, Soil pollution, Marine pollution, Noise

pollution, Thermal pollution, Nuclear hazards, Solid waste management causes urban and industrial wastes., Roles of an individual in prevention of Pollution case studies, Disaster management, floods, earthquake.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand environmental studies' multidisciplinary nature, definition, scope, importance, and the necessity for public awareness.

CO2 Understand the spectrum of natural resources, including renewable and non-renewable sources, associated problems, environmental impacts, and the individual's role in conservation for sustainable living.

CO3 Understand ecosystem concepts, structure, functions, energy flow, succession, food chains, webs, and pyramids, focusing on forest, grassland, desert, and aquatic ecosystems.

CO4 Understand causes, effects, and control measures for air, water, soil, marine, noise, thermal pollution, nuclear hazards, solid waste management, disaster management, and individual roles.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	2	3	3	2	3	3
CO 2	3	3	2	2	3	2	2	3	3
CO 3	3	3	2	2	2	2	2	3	3
CO 4	3	3	2	2	2	3	2	3	3

Course Code	Subject	Category	Credits
BVHOM-606	Entrepreneurship Development in Hotel Industry	General	4

UNIT - 1 ENTREPRENEURSHIP, Introduction to Entrepreneur, Entrepreneurship and Enterprise - Importance and relevance of the entrepreneur - Factors influencing entrepreneurship Pros and Cons of being an entrepreneur, Characteristics of a successful entrepreneur - Competency requirement for entrepreneurs Types of Entrepreneurs, Problems and promotion of Women entrepreneurs

UNIT - 2 SMALL SCALE ENTERPRISES: Small scale enterprises/ Tiny industries/Ancillary industries/ Cottage Industries - definition, meaning, product range, capital investment, ownership patterns, Importance and role played by SSI in the development of the Indian economy.

UNIT - 3 SMALL SCALE INDUSTRY: Problems faced by SSI's and the steps taken to solve the problems - Policies governing SSI's, Sickness in SSE's – Meaning and definition of a sick industry – Causes of industrial sickness, Preventive and remedial measures for sick industries.

UNIT - 4 STARTING A SMALL BUSINESS, Business opportunity, scanning the environment for opportunities, evaluation of alternatives and selection based on personal competencies., Steps involved in starting a business venture – location, clearances and permits required, formalities, licensing and registration procedures., Assessment of the market for the proposed project - financial, technical and social feasibility of the project.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand entrepreneurship, factors influencing it, pros and cons, successful entrepreneur characteristics, competency requirements, types, and promotion of women entrepreneurs.

CO2 Understand small scale enterprises' definition, product range, investment, ownership, and their role in India's economy.

CO3 Identify problems faced by SSI's, policies governing them, industrial sickness causes, and preventive measures.

CO4 Identify the learn business opportunity identification, environmental scanning, evaluation, selection based on personal competencies, steps in starting a venture, market assessment, and feasibility analysis.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	3	2	2	3	3
CO 2	3	3	3	3	3	2	2	3	3
CO 3	3	3	2	3	3	2	2	3	3
CO 4	3	3	2	3	3	2	2	3	3

Course Code	Subject	Category	Credits
BVHOMP-607	Vocational Practical-VI with Internship	Skill	6

- Demonstrations/ Preparation of some popular cold cuts
- Cold Desserts- Mousse, Souffles, Condes & Custards.

Course Outcomes:

Upon completion of this course the student will be able to:

CO1 Understand the preparation techniques and characteristics of popular cold cuts through demonstrations, enhancing knowledge and culinary skills.

CO2 Acquire proficiency in preparing cold desserts such as mousse, soufflés, condes, and custards.

CO3 Understand the techniques, ingredients, and presentation methods specific to each dessert type.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO 1	3	3	2	3	2	2	3	2	2
CO 2	3	2	2	2	2	2	3	2	3
CO 3	3	2	2	3	2	3	3	2	3