COMPUTER SCIENCE ENGINEERING (R 19)

I Year - I Semester

ENGLISH

Course Outcomes

At the end of the module, the learners will be able to

CO 1. Understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information

CO 2. Employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information

CO 3. Recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs

CO 4. Form sentences using proper grammatical structures and correct word forms

MATHEMATICS-II (Mathematical Methods)

Course Outcomes:

At the end of the course, the student will be able to

CO 1. Utilize mean value theorems to real life problems

CO 2. Solve the differential equations related to various engineering fields

CO 3. Familiarize with functions of several variables which is useful in optimization

CO 4. Apply double integration techniques in evaluating areas bounded by region

CO 5. Students will also learn important tools of calculus in higher dimensions.

CO 6. Students will become familiar with 2- dimensional and 3-dimensional coordinate systems

ENGINEERING DRAWING

Course Outcomes:

CO 1. Understand the techniques of constructing the various types of polygons, curves and scales.

CO 2. the students will draw the projections of the various types of solids in different positions inclined to one of the planes.

CO 3. The student will learn how to visualize 2D & 3D objects and can represent the 3D objects in 2D planes with proper dimensioning, scaling etc.

IT WORKSHOP

Course Outcomes:

Students should be able to:

CO 1. Assemble and disassemble components of a PC

CO 2. Construct a fully functional virtual machine, Summarize various Linux operating system commands,

CO 3. Secure a computer from cyber threats, Learn and practice programming skill in Github, Hackerrank, Codechef, HackerEarth etc.

CO 4. Recognize characters & extract text from scanned images, Create audio files and podcasts

CO 5. Create video tutorials and publishing, use office tools for documentation, build interactive presentations, build websites, create quizzes & analyze responses.

I Year - II Semester

PROGRAMMING FOR PROBLEM SOLVING USING C

Course Outcomes:

Upon the completion of the course the student will learn

CO 1. To write algorithms and to draw flowcharts for solving problems

CO 2. To convert flowcharts/algorithms to C Programs, compile and debug programs

CO 3. To use different operators, data types and write programs that use two-way/ multi-way selection

CO 4. To select the best loop construct for a given problem

CO 5. To design and implement programs to analyze the different pointer applications

CO 6. To decompose a problem into functions and to develop modular reusable code

DIGITAL LOGIC DESIGN
Course Outcomes:

CO 1. An ability to define different number systems, binary addition and subtraction, 2's complement representation and operations with this representation.
CO 2. An ability to understand the different switching algebra theorems and apply them for logic functions.
CO 3. An ability to define the Karnaugh map for a few variables and perform an algorithmic reduction of logic functions.
CO 4. Students will be able to design various logic gates starting from simple ordinary gates to complex programmable logic devices & arrays.

CO 5. Students will be able to design various sequential circuits starting from flip-flop to registers and counters.

PROGRAMMING FOR PROBLEM SOLVING USING C LAB
Course Outcomes:

CO 1. Gains Knowledge on various concepts of a C language.

CO 2. Able to draw flowcharts and write algorithms.

CO 3. Able design and development of C problem solving skills.

CO 4. Able to design and develop modular programming skills.

CO 5. Able to trace and debug a program

CONSTITUTION OF INDIA
Course Outcomes:

CO 1. Understand historical background of the constitution making and its importance for building a democratic India.

CO 2. Understand the functioning of three wings of the government ie., executive, legislative and judiciary.

CO 3. Understand the value of the fundamental rights and duties for becoming good citizen of India.

CO 4. Analyze the decentralization of power between central, state and local self-government.

CO 5. Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy

APPLIED / ENGINEERING CHEMISTRY LABORATORY

Course Outcomes:

CO 1. Attain knowledge in volumetric analysis; redox titrations with different indicators and EDTA titrations.

CO 2. Understand different methods of chemical analysis and use of some commonly employed instruments.

CO 3. Acquire knowledge in experimental skills and they are exposed to a few instrumental methods of chemical analysis.

II Year – I SEMESTER

STATISTICS WITH R PROGRAMMING

Course Outcomes:

At the end of this course, students will be able to:

CO 1. List motivation for learning a programming language

CO 2. Access online resources for R and import new function packages into the R workspace

CO 3. Import, review, manipulate and summarize data-sets in R

CO 4. Explore data-sets to create testable hypotheses and identify appropriate statistical tests

CO 5. Perform appropriate statistical tests using R Create and edit visualizations

MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

Course Outcomes:

CO 1. Student will be able to demonstrate skills in solving mathematical problems

CO 2. Student will be able to comprehend mathematical principles and logic

CO 3. Student will be able to demonstrate knowledge of mathematical modeling and proficiency in using mathematical software

CO 4. Student will be able to manipulate and analyze data numerically and/or graphically using appropriate Software

CO 5. Student will be able to communicate effectively mathematical ideas/results verbally or in writing

PYTHON PROGRAMMING

Course Outcomes:

CO 1. Making Software easily right out of the box.

CO 2. Experience with an interpreted Language.

CO 3. To build software for real needs.

CO 4. Prior Introduction to testing software

DATASTRUCTURES THROUGH C++ LAB
Course Outcomes:
At the end of this lab session, the student will

CO 1. Be able to design and analyze the time and space efficiency of the data structure

CO 2. Be capable to identity the appropriate data structure for given problem

CO 3. Have practical knowledge on the application of data structures

<div align="center">

II Year – II SEMESTER

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SOFTWARE ENGINEERING

Course Outcomes:
CO 1. Define and develop a software project from requirement gathering to implementation.

CO 2. Obtain knowledge about principles and practices of software engineering.

CO 3. Focus on the fundamentals of modeling a software project.

CO 4. Obtain knowledge about estimation and maintenance of software systems

JAVA PROGRAMMING

Course Outcomes:

CO 1. Understand Java programming concepts and utilize Java Graphical User Interface in Program writing.

CO 2. Write, compile, execute and troubleshoot Java programming for networking concepts.

CO 3. Build Java Application for distributed environment.

CO 4. Design and develop multi-tier applications.

CO 5. Identify and Analyze Enterprise applications.

COMPUTER ORGANIZATION

Course Outcomes:

CO 1. Students can understand the architecture of modern computer.

CO 2. They can analyze the Performance of a computer using performance equation

CO 3. Understanding of different instruction types.

CO 4. Students can calculate the effective address of an operand by addressing modes

CO 5. They can understand how computer stores positive and negative numbers.

CO 6. Understanding of how a computer performs arithmetic operation of positive and negative numbers.

III Year – I Semester

COMPILER DESIGN

Course Outcomes:

CO 1. Acquire knowledge in different phases and passes of Compiler, and specifying different types of tokens by lexical analyzer, and able to use the Compiler tools like LEX, YACC, etc.

CO 2. Parser and its types i.e., Top-down and Bottom-up parsers.

CO 3. Construction of LL, SLR, CLR and LALR parse table.

CO 4. Syntax directed translation, synthesized and inherited attributes.

CO 5. Techniques for code optimization.

OBJECT ORIENTED ANALYSIS & DESIGN USING UML

Course Outcomes:

CO 1. Ability to find solutions to the complex problems using object-oriented approach

CO 2. Represent classes, responsibilities and states using UML notation

CO 3. Identify classes and responsibilities of the problem domain

OPERATING SYSTEMS

Course Outcomes:

CO 1. Design various Scheduling algorithms.

CO 2. Apply the principles of concurrency.

CO 3. Design deadlock, prevention and avoidance algorithms.

CO 4. Compare and contrast various memory management schemes.

CO 5. Design and implement a prototype file system.

CO 6. Perform administrative tasks on Linux Servers

CO 7. Introduction to Android Operating System Internals

UNIFIED MODELING LAB

Course Outcomes:

CO 1. Understand the Case studies and design the Model.

CO 2. Understand how design patterns solve design problems.

CO 3. Develop design solutions using creational patterns.

CO 4. Construct design solutions by using structural and behavioral patterns

III Year – II Semester

DATA WARE HOUSING AND DATA MINING

Course Outcomes:

CO 1. Understand stages in building a Data Warehouse

CO 2. Understand the need and importance of preprocessing techniques

CO 3. Understand the need and importance of Similarity and dissimilarity techniques

CO 4. Analyze and evaluate performance of algorithms for Association Rules.

CO 5. Analyze Classification and Clustering algorithms

SOFTWARE TESTING METHODOLOGIES

Course Outcomes:

CO 1. Understand the basic testing procedures.

CO 2. Able to support in generating test cases and test suites.

CO 3. Able to test the applications manually by applying different testing methods and automation tools.

CO 4. Apply tools to resolve the problems in Real time environment.

ARTIFICIAL INTELLIGENCE

Course Outcomes:

CO 1. Identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem.

CO 2. Formalize a given problem in the language/framework of different AI methods (e.g., as a search problem, as a constraint satisfaction problem, as a planning problem, as a Markov decision process, etc).

CO 3. Implement basic AI algorithms (e.g., standard search algorithms or dynamic programming).

CO 4. Design and carry out an empirical evaluation of different algorithms on problem formalization, and state the conclusions that the evaluation supports.

DATA WARE HOUSING AND DATA MINING LAB

Course Outcomes:

CO 1. The data mining process and important issues around data cleaning, pre-processing and integration.

CO 2. The principal algorithms and techniques used in data mining, such as clustering, association mining, classification and prediction.

<center>**IV Year – I SEMESTER   (R 16)**</center>

WEB TECHNOLOGIES

Course Outcomes:

CO 1. Analyze a web page and identify its elements and attributes.

CO 2. Create web pages using XHTML and Cascading Styles sheets.

CO 3. Build dynamic web pages.

CO 4. Build web applications using PHP.

CO 5. Programming through PERL and Ruby

CO 6. Write simple client-side scripts using AJAX

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Outcomes:

CO 1. The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product and the knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs.

CO 2. One is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units.

CO 3. The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis and to evaluate various investment project proposals with the help of capital budgeting techniques for decision making.

MOBILE COMPUTING

Course Outcomes:

CO 1. Able to think and develop new mobile application.
CO 2. Able to take any new technical issue related to this new paradigm and come up with a solution(s).
CO 3. Able to develop new ad hoc network applications and/or algorithms/protocols.
CO 4. Able to understand & develop any existing or new protocol related to mobile environment

CLOUD COMPUTING

Course Outcomes:

CO 1. Understanding the key dimensions of the challenge of Cloud Computing

CO 2. Assessment of the economics, financial, and technological implications for selecting cloud computing for own organization

CO 3. Assessing the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-based applications.

CO 4. Assessment of own organizations' needs for capacity building and training in cloud computing-related IT areas.

DISTRIBUTED SYSTEMS

Course Outcomes:

CO 1. Develop a familiarity with distributed file systems.

CO 2. Describe important characteristics of distributed systems and the salient architectural features of such systems.

CO 3. Describe the features and applications of important standard protocols which are used in distributed systems.

CO4. Gaining practical experience of inter-process communication in a distributed environment

MANAGEMENT SCIENCE

Course Outcomes:

CO 1. After completion of the Course the student will acquire the knowledge on management functions, global leadership and organizational behavior.

CO 2. Will familiarize with the concepts of functional management project management and strategic management.

MACHINE LEARNING

Course Outcomes:

CO 1. Recognize the characteristics of machine learning that make it useful to real-world Problems.

CO 2. Characterize machine learning algorithms as supervised, semi-supervised, and unsupervised.

CO 3. Have heard of a few machine learning toolboxes.

CO 4. Be able to use support vector machines.

CO 5. Be able to use regularized regression algorithms.

CO 6. Understand the concept behind neural networks for learning non-linear functions.

CLOUD COMPUTING

Course Outcomes:

CO 1. Understanding the key dimensions of the challenge of Cloud Computing

CO 2. Assessment of the economics, financial, and technological implications for selecting cloud computing for own organization

CO 3. Assessing the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-based applications.

CO 4. Assessment of own organizations' needs for capacity building and training in cloud computing-related IT areas

CIVIL ENGINEERING (R19)

I Year - I Semester

Mathematics-I

Course Outcomes:

At the end of the course, the student will be able to

- utilize mean value theorems to real life problems (L3)

- solve the differential equations related to various engineering fields (L3)

- familiarize with functions of several variables which is useful in optimization (L3)

- Apply double integration techniques in evaluating areas bounded by region (L3)

- Students will also learn important tools of calculus in higher dimensions. Students will become familiar with 2- dimensional and 3-dimensional coordinate systems (L5)

I Year - I Semester

ENGINEERING PHYSICS

Course Outcomes:

The students will be able to

- Identify forces and moments in mechanical systems using scalar and vector techniques
- extend Newton 's second law for inertial and non-inertial frame of reference
- explain simple harmonic motion and damped harmonic motions.

I Year - I Semester

MATHEMATICS – II

Course Outcomes:

At the end of the course, the student will be able to

• develop the use of matrix algebra techniques that is needed by engineers for practical applications (L6)

• solve system of linear algebraic equations using Gauss elimination, Gauss Jordan, Gauss Seidel (L3)

• evaluate approximating the roots of polynomial and transcendental equations by different algorithms (L5)

• apply Newton 's forward & backward interpolation and Lagrange 's formulae for equal and unequal intervals (L3)

• apply different algorithms for approximating the solutions of ordinary differential equations to its analytical computations (L3)

I Year - I Semester

ENIGINEERING MECHANICS

Course Outcomes:

 Upon the successful completion of this course

• The students are to be exposed to the concepts of force and friction , direction and its application.

• The students are to be exposed to application of free body diagrams. Solution to problems using graphical methods and law of triangle of forces.

• The students are to be exposed to concepts of centre of gravity

• The students are to be exposed to concepts of moment of inertia and polar moment of inertia including transfer methods and their applications.

• The students are to be exposed to motion in straight line and in curvilinear paths, its velocity and acceleration computation and methods of representing plane motion.

• The students are to be exposed to concepts of work, energy and particle motion

I Year – II Semester

ENGLISH

Course Outcomes:

At the end of the module, the learners will be able to

- understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information

- ask and answer general questions on familiar topics and introduce oneself/others

- employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information
- recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs
- form sentences using proper grammatical structures and correct word forms

I Year - II Semester

PROGRAMMING FOR PROBLEM SOLVING USING C

Course Outcomes:

Upon the completion of the course the student will learn

- To write algorithms and to draw flowcharts for solving problems
- To convert flowcharts/algorithms to C Programs, compile and debug programs
- To use different operators, data types and write programs that use two-way/ multi-way selection
- To select the best loop construct for a given problem
- To design and implement programs to analyze the different pointer applications
- To decompose a problem into functions and to develop modular reusable code
- To apply File I/O operations

I Year - II Semester

COMPUTER AIDED ENGINEERING DRAWING

Course Outcomes:

Upon the successful completion of this course:

- Student get exposed on working of sheet metal with help of development of surfaces.
- Student understands how to know the hidden details of machine components with the help of sections and interpenetrations of solids.
- Student shall exposed to modelling commands for generating 2D and 3D objects using computer aided drafting tools which are useful to create machine elements for computer aided analysis.

I Year - II Semester

PROGRAMMING FOR PROBLEM SOLVING USING C LAB

Course Outcomes:

Upon the successful completion of this course:

- Gains Knowledge on various concepts of a C language.
- Able to draw flowcharts and write algorithms.
- Able design and development of C problem solving skills.
- Able to design and develop modular programming skills.
- Able to trace and debug a program

CIVIL ENGINEERING (R16)

II Year - I Semester

PROBABILITY AND STATISTICS

Course Outcomes:

Upon the successful completion of this course:

- Examine, analyze, and compare various Probability distributions for both discrete and continuous random variables.
- 2. Describe and compute confidence intervals for the mean of a population.
- 3. Describe and compute confidence intervals for the proportion and the variance of a population and test the hypothesis concerning mean, proportion and variance and perform ANOVA test.
- 4. Fit a curve to the numerical data.

II Year - I Semester

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Course Outcomes:

Upon the successful completion of this course:

• Able to analyse the various electrical networks.

• Able to understand the operation of DC generators,3-point starter and conduct the Swinburne's Test.

• Able to analyse the performance of transformer.

• Able to explain the operation of 3-phase alternator and 3-phase induction motors.

• Able to analyse the operation of half wave, full wave rectifiers and OP-AMPs.

• Able to explain the single stage CE amplifier and concept of feedback amplifier.

II Year - I Semester

STRENGTH OF MATERIALS-I

Course Outcomes:

Upon the successful completion of this course:

• The student will be able to understand the basic materials behavior under the influence of different external loading conditions and the support conditions

• The student will be able to draw the diagrams indicating the variation of the key performance features like bending moment and shear forces

• The student will have knowledge of bending concepts and calculation of section modulus and for determination of stresses developed in the beams and deflections due to various loading conditions

• The student will be able to assess stresses across section of the thin and thick cylinders to arrive at optimum sections to withstand the internal pressure using Lame's equation.

II Year - I Semester

FLUID MECHANICS

Course Outcomes:

Upon the successful completion of this course:

• Understand the various properties of fluids and their influence on fluid motion and analyse a variety of problems in fluid statics and dynamics.

• Calculate the forces that act on submerged planes and curves.

• Identify and analyse various types of fluid flows.

• Apply the integral forms of the three fundamental laws of fluid mechanics to turbulent and laminar flow through pipes and ducts in order to predict relevant pressures, velocities and forces.

• Draw simple hydraulic and energy gradient lines.

• Measure the quantities of fluid flowing in pipes, tanks and channels.

II Year – II Semester

BUILDING PLANNING AND DRAWING

Course Outcomes:

 Upon the successful completion of this course:

• Upon successful completion of the course:

• Student should be able to plan various buildings as per the building by-laws.

 • The student should be able to distinguish the relation between the plan, elevation and cross section and identify the form and functions among the buildings.

 • The student is expected to learn the skills of drawing building elements and plan the buildings as per requirements.

II Year – II Semester

STRENGTH OF MATERIALS- II

Course Outcomes:

 Upon the successful completion of this course:

• The student will be able to understand the basic concepts of Principal stresses developed in a member when it is subjected to stresses along different axes and design the sections.

• The student can asses stresses in different engineering applications like shafts, springs, columns and struts subjected to different loading conditions

• The student will be able to assess forces in different types of trusses used in construction.

II Year – II Semester

HYDRAULICS AND HYDRAULIC MACHINERY

Course Outcomes:

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

• Solve uniform and non uniform open channel flow problems.

• Apply the principals of dimensional analysis and similitude in hydraulic model testing.

• Understand the working principles of various hydraulic machineries and pumps.

II Year – II Semester

CONCRETE TECHNOLOGY

Course Outcomes:

Upon successful completion of this course, student will be able to

• understand the basic concepts of concrete.

• realize the importance of quality of concrete.

• familiarize the basic ingredients of concrete and their role in the production of concrete and its behaviour in the field.

• test the fresh concrete properties and the hardened concrete properties.

• evaluate the ingredients of concrete through lab test results. design the concrete mix by BIS method.

• familiarize the basic concepts of special concrete and their production and applications. understand the behaviour of concrete in various environments.

II Year – II Semester

TRANSPORTATION ENGINEERING – I

Course Outcomes:

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

• Plan highway network for a given area.

• Determine Highway alignment and design highway geometrics

• Design Intersections and prepare traffic management plans

• Judge suitability of pavement materials and design flexible and rigid pavements

 • Construct and maintain highways

III Year – I Semester

ENGINEERING GEOLOGY

Course Outcomes:

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

 • Identify and classify the geological minerals

• Measure the rock strengths of various rocks

• Classify and measure the earthquake prone areas to practice the hazard zonation

• Classify, monitor and measure the Landslides and subsidence

• Prepares, analyses and interpret the Engineering Geologic maps

 • Analyses the ground conditions through geophysical surveys.

• Test the geological material and ground to check the suitability of civil engineering project construction.

• Investigate the project site for mega/mini civil engineering projects.Site selection for mega engineering projects like Dams, Tunnels, disposal sites etc…

III Year – I Semester

STRUCTURAL ANALYSIS – II

Course Outcomes:

At the end of this course; the student will be able to

• Differentiate Determinate and Indeterminate Structures

• Carryout lateral Load analysis of structures

• Analyze Cable and Suspension Bridge structures

• Analyze structures using Moment Distribution, Kani's Method and Matrix methods

III Year – I Semester

DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES

Course Outcomes:

At the end of this course the student will be able to

• Work on different types of design philosophies

• Carryout analysis and design of flexural members and detailing

 • Design structures subjected to shear, bond and torsion

• Design different type of compression members

III Year – I Semester

CONCRETE TECHNOLOGY LAB

Course Outcomes:

Upon successful completion of this course, student will be able to

• Determine the consistency and fineness of cement.

• Determine the setting times of cement.

• Determine the specific gravity and soundness of cement.

• Determine the compressive strength of cement.

• Determine the workability of cement concrete by compaction factor, slump and Vee – Bee tests

• Determine the specific gravity of coarse aggregate and fine aggregate by Sieve analysis.

• Determine the flakiness and elongation index of aggregates.

 • Determine the bulking of sand.

• Understand the non-destructive testing procedures on concrete.

III Year – II Semester

DESIGN AND DRAWING OF STEEL STRUCTURES

Course Outcomes:

At the end of this course the student will be able to

• Work with relevant IS codes

• Carryout analysis and design of flexural members and detailing

• Design compression members of different types with connection detailing

• Design Plate Girder and Gantry Girder with connection detailing

• Produce the drawings pertaining to different components of steel structures

III Year – II Semester

GEOTECHNICAL ENGINEERING – I

Course Outcomes:

Upon the successful completion of this course

• The student must know the definition of the various parameters related to soil mechanics and establish their inter-relationships.

• The student should be able to know the methods of determination of the various index properties of the soils and classify the soils.

• The student should be able to know the importance of the different engineering properties of the soil such as compaction, permeability, consolidation and shear strength and determine them in the laboratory.

• The student should be able to apply the above concepts in day-to-day civil engineering practice.

III Year – II Semester

ENVIRONMENTAL ENGINEERING – I

Course Outcomes:

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

• Plan and design the water and distribution networks and sewerage systems

• Identify the water source and select proper intake structure

• Characterisation of water

• Select the appropriate appurtenances in the water supply

• Selection of suitable treatment flow for raw water treatments

III Year – II Semester

GEOTECHNICAL ENGINEERING LAB

Course Outcomes:

Upon successful completion of this course, student will be able to

• Determine index properties of soil and classify them.

• Determine permeability of soils.

• Determine Compaction, Consolidation and shear strength characteristics

CIVIL ENGINEERING (R16)

IV Year – I Semester

ENVIRONMENTAL ENGINEERING – II

Course Outcomes:

By the end of successful completion of this course, the students will be able to:

- Plan and design the sewerage systems
- Characterisation of Sewage
- Select the appropriate appurtenances in the sewerage systems
- Selection of suitable treatment flow for sewage treatment
- Identify the critical point of pollution in a river for a specific amount of pollutant disposal into the river

IV Year – I Semester

WATER RESOURCES ENGINEERING–II

Course Outcomes:

At the end of the course the student will be able to

- estimate irrigation water requirements
- design irrigation canals and canal network
- plan an irrigation system
- design irrigation canal structures
- plan and design diversion head works
- analyse stability of gravity and earth dams
- design ogee spillways and energy dissipation works

IV Year – I Semester

GEOTECHNICAL ENGINEERING – II

Course Outcomes:

Upon the successful completion of this course:

- The student must be able to understand the various types of shallow foundations and decide on their location based on soil characteristics.
- The student must be able to compute the magnitude of foundation settlement to decide the size of the foundation.
- The student must be able to use the field test data and arrive at the bearing capacity.
- The student must be able to design Piles based on the principles of bearing capacity.

IV Year – I Semester

GIS & CAD LAB

Course Outcomes:

At the end of the course the student will be able to

- work comfortably on GIS software
- digitize and create thematic map and extract important features
- develop digital elevation model

- use structural analysis software to analyze and design 2D and 3D frames
- design and analyze retaining wall and simple towers using CADD software

IV Year – II Semester

ESTIMATING, SPECIFICATIONS & CONTRACTS

Course Outcomes:

Upon the successful completion of this course:

- The student should be able to determine the quantities of different components of buildings.
- The student should be in a position to find the cost of various building components.
- The student should be capable of finalizing the value of structures.

IV Year – II Semester

CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Course Outcomes:

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

• appreciate the importance of construction planning

• understand the functioning of various earth moving equipment

• know the methods of production of aggregate products and concreting and usage of machinery required for the works.

• apply the gained knowledge to project management and construction techniques

IV Year – II Semester

URBAN TRANSPORTATION PLANNING

Course Outcomes:

At the end of course, Student can

- Estimate travel demand for an urban area.
- Plan the transportation network for a city.
- Identify the corridor and plan for providing good transportation facilities.
- Evaluate various alternative transportation proposals.

IV Year – II Semester

PROJECT WORK

Course Outcomes:

Up on completion of the Project work, the student will be able to

• Apply all levels of Engineering knowledge in solving the Engineering problems.

• Work together with team spirit.

• Use Civil Engineering software at least one.

• Document the projects

ELECTRONICS AND COMMUNICATIONS ENGINEERING

I YEAR-I SEMISTER(R16)

MATHEMATICS-I

Course Outcomes: At the end of the Course, Student will be able to:

1. Solve linear differential equations of first, second and higher order.

2. Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE.

3. Calculate total derivative, Jocobian and minima of functions of two variables.

APPLIED PHYSICS.

Course Outcomes

1. Construction and working details of instruments, ie., Interferometer, Diffractometer and Polari meter are learnt.
2. Study EM-fields and semiconductors under the concepts of Quantum mechanics paves way for their optimal utility.

COMPUTER PROGRAMMING

Course Outcomes

1. Understand the basic terminology used in computer programming
2. Write, compile and debug programs in C language.
3. Use different data types in a computer program.
4. Design programs involving decision structures, loops and functions.

5. Explain the difference between call by value and call by reference
6. Understand the dynamics of memory by the use of pointers
7. Use different data structures and create/update basic data files.

ENGLISH - COMMUNICATION SKILLS LAB- 1

Course Outcomes:

1. A study of the communicative items in the laboratory will help the students become successful in the competitive world.
2. The course content along with the study material is divided into six units.

APPLIED / ENGINEERING PHYSICS LAB

Course Outcomes :

1. Physics lab curriculum gives fundamental understanding of design of an instrument with targeted accuracy for physical measurements.

APPLIED / ENGINEERING PHYSICS VIRTUAL LABS ASSIGNMENTS

Course Outcomes:

1.Physics Virtual laboratory curriculum in the form of assignment ensures an engineering graduate to prepare a /technical/mini-project/ experimental report with scientific temper.

ENGINEERING WORKSHOP & IT WORKSHOP

Course Outcomes:

1.Common understanding of concepts, patterns of decentralization implementation in Africa

2. Identified opportunities for coordinated policy responses, capacity building and implementation of best practices †
3. Identified instruments for improved decentralization to the local level †
4. Identified strategies for overcoming constraints to effective decentralization and sustainable management at different levels

I YEAR-IISEMISTER

MATHEMATICS-III

Course Outcomes: At the end of the Course, Student will be able to:
1. Determine rank, Eigenvalues and Eigen vectors of a given matrix and solve simultaneous

linear
equations.
2. Solve simultaneous linear equations numerically using various matrix methods.
3. Determine double integral over a region and triple integral over a volume.
4. Calculate gradient of a scalar function, divergence and curl of a vector function. Determine line,surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals.

APPLIED CHEMISTRY

Course Outcomes

1. The advantages and limitations of plastic materials and their use in design would be understood. Fuels which are used commonly and their economics, advantages and limitations are discussed. Reasons for corrosion and some methods of corrosion control would be understood. The students would be now aware of materials like nano-materials and fullerenes and their uses.

2. Similarly liquid crystals and superconductors are understood. The importance of green synthesis is well understood and how they are different from conventional methods is also explained. Conductance phenomenon is better understood. The students are exposed to some of the alternative fuelsand their advantages and limitations

ELECTRICAL &MECHANICAL TECHNOLOGY

Course Outcomes:

1. Able to analyse the various electrical networks.
2. Able to understand the operation of DC generator, DC Motor ,3-point starter and Speed control   methods.
3. Able to analyse the performance of transformer.
4. Able to explain the operation of 3-phase alternator and 3-phase induction motors.
5. Able to explain the working principle of various measuring instruments.

ENVIRONMENTAL STUDIES

Course Outcomes:

The student should have knowledge on

1. The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources
2. The concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web
3. The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity

4. Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices
5. Social issues both rural and urban environment and the possible means to combat the challenges.
6. The environmental legislations of India and the first global initiatives towards sustainable development.
7. About environmental assessment and the stages involved in EIA and the environmental audit.
8. Self Sustaining Green Campus with Environment Friendly aspect of – Energy, Water and Wastewater reuse Plantation, Rain water Harvesting, Parking Curriculum.

DATA STRUCTURES

Course Outcomes:

Apply advanced data structure strategies for exploring complex data structures.

1. Compare and contrast various data structures and design techniques in the area Of Performance.
2. Implement all data structures like stacks, queues, trees, lists and graphs and compare their Performance and trade offs.

APPLIED/ENGINEERING CHEMISTRY LABORATORY

Course Outcomes

1. The students entering into the professional course have practically very little exposure to lab classes.
2. The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations; then they
3. are exposed to a few instrumental methods of chemical analysis. Thus at the end of the lab course, the student is
4. exposed to different methods of chemical analysis and use of some commonly employed instruments.

ENGLISH - COMMUNICATION SKILLS LAB-2

Course Outcomes:

1. A study of the communicative items in the laboratory will help the students become successful in the competitive world.

COMPUTER PROGRAMMING LAB

Course Outcomes:

2. Apply and practice logical ability to solve the problems.
3. Understand C programming development environment, compiling, debugging, and linking and executing a
4. program using the development environment
5. Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into
6. programs
7. Understand and apply the in-built functions and customized functions for solving the problems.
8. Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.

II YEAR – I SEMISTER

ELECTRONIC DEVICES AND CIRCUITS

Course Outcomes:

At the end of this course the student can able to:
1. Understand the basic concepts of semiconductor physics.
2. Understand the formation of p-n junction and how it can be used as a p-n junction as diode in different modes of operation.
3. Know the construction, working principle of rectifiers with and without filters with relevant expressions and necessary comparisons.
4. Understand the construction, principle of operation of transistors, BJT and FET with their V-I characteristics in different configurations.
5. Know the need of transistor biasing, various biasing techniques for BJT and FET and stabilization concepts with necessary expressions.
6. Perform the analysis of small signal low frequency transistor amplifier circuits using BJT and FET indifferent configurations.

SIGNALS & SYSTEMS

Course Outcomes:

At the end of this course the student will able to:
1. Characterize the signals and systems and principles of vector spaces, Concept of orthgonality.
2. Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform.

3. Apply sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back.
4. Understand the relationships among the various representations of LTI systems
5. Understand the Concepts of convolution, correlation, Energy and Power density spectrum and their relationships.
6. Apply z-transform to analyze discrete-time signals and systems.

RANDOM VARIABLES & STOCHASTIC PROCESSES

Course Outcomes:

After completion of the course, the student will be able to
- Mathematically model the random phenomena and solve simple probabilistic problems.
- Identify different types of random variables and compute statistical averages of these random variables.
- Characterize the random processes in the time and frequency domains.
- Analyze the LTI systems with random inputs.
- Apply these techniques to analyze the systems in the presence of different types of noise.

NETWORKS & ELECTRICAL TECHNOLOGY LAB

Course Outcomes:

1. Able to analyse RLC circuits and understand resonant frequency and Q-factor.
2. Able to determine first order RC/RL networks of periodic non- sinusoidal waveforms.
3. Able to apply network theorems to analyze the electrical network.
4. Able to describe the performance of dc shunt machine.
5. Able to investigate the performance of 1-phase transformer.
6. Able to perform tests on 3-phase induction motor and alternator to determine their performance
7. Characteristic

II YEAR-II SEM
ELECTRONIC CIRCUIT ANALYSIS

Course Outcomes:

At the end of this course the student can able to:
1. Design and analysis of small signal high frequency transistor amplifier using BJT and FET.
2. Design and analysis of multi stage amplifiers using BJT and FET and Differential amplifier using BJT

3. Derive the expressions for frequency of oscillation and condition for oscillation of RC and LC oscillators and their amplitude and frequency stability concept.
4. Know the classification of the power and tuned amplifiers and their analysis with performance comparison.

CONTROL SYSTEMS

Course Outcomes:
1. This course introduces the concepts of feedback and its advantages to various control systems
2. The performance metrics to design the control system in time-domain and frequency domain are introduced.
3. Control systems for various applications can be designed using time-domain and frequency domain analysis.
4. In addition to the conventional approach, the state space approach for the analysis of control systems is also introduced.

EM WAVES AND TRANSMISSION LINES

Course Outcomes:

At the end of this course the student can able to:
1. Determine E and H using various laws and applications of electric & magnetic fields
2. Apply the Maxwell equations to analyze the time varying behavior of EM waves
3. Gain the knowledge in uniform plane wave concept and characteristics of uniform plane wave in various media
4. Calculate Brewster angle, critical angle and total internal reflection
5. Derive the expressions for input impedance of transmission lines
6. Calculate reflection coefficient, VSWR etc. using smith chart

ANALOG COMMUNICATIONS

Course Outcomes:
After undergoing the course, students will be able to
1. Differentiate various Analog modulation and demodulation schemes and their spectral characteristics
2. Analyze noise characteristics of various analog modulation methods
3. Analyze various functional blocks of radiao transmitters and receivers
4. Design simple analog systems for various modulation techniques.

PULSE AND DIGITAL CIRCUITS

Course Outcomes:

After going through this course the student will be able to
1. Design linear and non-linear wave shaping circuits.
2. Apply the fundamental concepts of wave shaping for various switching and signal generating circuits.
3. Design different multivibrators and time base generators.
4. Utilize the non sinusoidal signals in many experimental research areas.

MANAGEMENT SCIENCE
Course Outcome:
1. After completion of the Course the student will acquire the knowledge on management functions, global leadership and organizational behavior.
2. Will familiarize with the concepts of functional management project management and strategicManagement

III YEAR-I SMISTER
COMPUTER ARCHITECTURE AND ORGANIZATION
Course Outcomes:

1. Students can understand the architecture of modern computer.
2. They can analyze the Performance of a computer using performance equation
3. Understanding of different instruction types.
4. Students can calculate the effective address of an operand by addressing modes
5. They can understand how computer stores positive and negative numbers.
6. Understanding of how a computer performs arithmetic operation of positive and negative numbers.

LINEAR IC APPLICATIONS
Course Outcomes:

1. Design circuits using operational amplifiers for various applications.
2. Analyze and design amplifiers and active filters using Op-amp.
3. Diagnose and trouble-shoot linear electronic circuits.
4. Understand the gain-bandwidth concept and frequency response of the amplifier configurations.
5. Understand thoroughly the operational amplifiers with linear integrated circuits.

DIGITAL IC APPLICATIONS
Course Outcomes:

At the end of this course the student can able to:
1. Understand the structure of commercially available digital integrated circuit families.
2. Learn the IEEE Standard 1076 Hardware Description Language (VHDL).
3. Model complex digital systems at several levels of abstractions, behavioral, structural, simulation, synthesisand rapid system prototyping.
4. Analyze and design basic digital circuits with combinatorial and sequential logic circuits using VHDL.

DIGITAL COMMUNICATIONS

Course Outcomes:

After undergoing the course students will be able to:

1. Determine the performance of different waveform coding techniques for the generation and digital representation of the signals.
2. Determine the probability of error for various digital modulation schemes
3. Analyze different source coding techniques
4. Compute and analyze different error control coding schemes for the reliable transmission of digital information over the channel.

ANTENNA AND WAVE PROPAGATION

Course Outcomes:

After going through this course the student will be able to
1. Identify basic antenna parameters.
2. Design and analyze wire antennas, loop antennas, reflector antennas, lens antennas, horn antennas and microstrip antennas
3. Quantify the fields radiated by various types of antennas
4. Design and analyze antenna arrays
5. Analyze antenna measurements to assess antenna's performance
6. Identify the characteristics of radio wave propagation

PROFESSIONAL ETHICSAND HUMAN VALUES

Course Outcomes:

1. It gives a comprehensive understanding of a variety issues that are encountered by every professional in discharging professional duties.
2. It provides the student the sensitivity and global outlook in the contemporary world to fulfill the professional obligations effectively.

III YEAR – II SEMISTER
MICROWAVE ENGINEERING

Course Outcomes:

After going through this course the student will be able to
1. Design different modes in waveguide structures
2. Calculate S-matrix for various waveguide components and splitting the microwave energy in a desired direction
3. Distinguish between Microwave tubes and Solid State Devices, calculation of efficiency of devices.
4. Measure various microwave parameters using a Microwave test bench

VLSI DESIGN

Course Outcomes:

At the end of this course the student can able to:
1. Understand the properties of MOS active devices and simple circuits configured when using them and the reason for such encumbrances as ratio rules by which circuits can be interconnected in silicon.
2. Know three sets of design rules with which nMOS and CMOS designs may be fabricated.
3. Understand the scaling factors determining the characteristics and performance of MOS circuits in silicon.

DIGITAL SIGNAL PROCESSING

Course Outcomes:

After going through this course the student will be able to
1. Apply the difference equations concept in the anayziation of Discrete time systems
2. Use the FFT algorithm for solving the DFT of a given signal
3. Design a Digital filter (FIR&IIR) from the given specifications
4. Realize the FIR and IIR structures from the designed digital filter.
5. Use the Multirate Processing concepts in various applications(eg: Design of phase shifters, Interfacing of digital systems…)
6. Apply the signal processing concepts on DSP Processor.

IV YEAR-I SEMISTER(R13)
VLSI DESIGN

Course Outcomes:

After going through this course the student will be able to

1. Apply the Concept of design rules during the layout of a circuit.
2. Model and simulate digital VLSI systems using hardware design language.
3. Synthesize digital VLSI systems from register-transfer or higher level descriptions
4. Understand current trends in semiconductor technology, and how it impacts scaling and performance.

COMPUTER NETWORKS

Course Outcomes:

The student will be able to

1. Analyze a communication system by separating out the different functions provided by the network; and some example networks.
2. Understand various network topologies required for communication Understand that there are fundamental limits to any communications system.
3. Understand the general principles behind addressing, routing, reliable transmission and other stateful protocols as well as specific examples of each.
4. Have an informed view of both the internal workings of the Internet and of a number of common Internet applications and protocols.

DIGITAL IMAGE PROCESSING

Course Outcomes:

After going through this course the student will be able to

1. Perform different transforms on image useful for image processing applications
2. Perform spatial and frequency domain filtering on image and can implement all smoothing and sharpening operations on images
3. Perform image restoration operations/techniques on images
4. Operate effectively on color images and different color conversions on images and can code images to achieve good compression
5. Do wavelet based image processing and image compression using wavelets
6. Perform all morphological operations on images and can be able to do image segmentation also.
7. Develop simple algorithms for image processing and use the various techniques involved in Bio Medical applications, etc.

COMPUTER ARCHITECTURE AND ORGANIZATION

Course Outcomes:

1. Understand the fundamentals of different instruction set architectures and their relationship to the CPU design. Understand the principles and the implementation of computer arithmetic and ALU.

2. Understand the memory system, I/O organization
3. Understand the operation of modern CPUs including interfacing, pipelining, memory systems and busses. ∫ Understand the principles of operation of multiprocessor systems.
4. Demonstrate the relationship between the software and the hardware and focuses on the foundational concepts that are the basis for current computer design.

RADAR SYSTEM

Course Outcomes:

After going through this course the student will be able to

1. Acquire the knowledge to apply and to design required parameters for a RADAR system.
2. Apply the techniques learned, to choose suitable RADAR from the available, for the required application.

OPTICAL COMMUNICATIONS

Course Outcomes:

After going through this course the student will be able to

1. Choose necessary components required in modern optical communications systems .
2. Design and build optical fiber experiments in the laboratory, and learn how to calculate electromagnetic modes in waveguides, the amount of light lost going through an optical system, dispersion of optical fibers.
3. Use different types of photo detectors and optical test equipment to analyze optical fiber and light wave systems. • Choose the optical cables for better communication with minimum losses
4. Design, build, and demonstrate optical fiber experiments in the laboratory

IV YEAR –II SEMISTER

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

Course Outcomes:

The student will be able to

1. Select the instrument to be used based on the requirements.
2. Understand and analyze different signal generators and analyzers.
3. Understand the design of oscilloscopes for different applications.
4. Design different transducers for measurement of different parameters.

EMBEDDED SYSTEMS

Course Outcomes:

After going through this course the student will be able to

1. Know basics of embedded system, classification, memories, different communication interface and what embedded firmware is and its role in embedded system, different system components.
2. Distinguish all communication devices in embedded system, other peripheral device.
3. Distinguish concepts of C versus embedded C and compiler versus cross-compiler.
4. Choose an operating system, and learn how to choose an RTOS

CELLULAR AND MOBILE COMMUNICATIONS

Course Outcomes:

At the end of this course the student can able to:

1. Identify the limitations of conventional mobile telephone systems; understand the concepts of cellular systems.

2. Understand the frequency management, channel assignment strategies and antennas in cellular systems.

3. Understand the concepts of handoff and architectures of various cellular systems.

ELECTRICAL & ELECTRONICS ENGINEERING
I Year I Semester

ENGLISH

Course Outcomes:

At the end of the module, the learners will be able to

- understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information
- ask and answer general questions on familiar topics and introduce oneself/others
- employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information
- recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs
- form sentences using proper grammatical structures and correct word forms

MATHEMATICS-I
Course Outcomes:

At the end of the course, the student will be able to

- utilize mean value theorems to real life problems (L3)
- solve the differential equations related to various engineering fields (L3)
- familiarize with functions of several variables which is useful in optimization (L3)
- Apply double integration techniques in evaluating areas bounded by region (L3)
- students will also learn important tools of calculus in higher dimensions. Students will become familiar with 2- dimensional and 3-dimensional coordinate systems (L5)

PROGRAMMING FOR PROBLEM SOLVING USING C
Course Outcomes:

Upon the completion of the course the student will learn
1) To write algorithms and to draw flowcharts for solving problems
2) To convert flowcharts/algorithms to C Programs, compile and debug programs
3) To use different operators, data types and write programs that use two-way/ multi-way selection
4) To select the best loop construct for a given problem
5) To design and implement programs to analyze the different pointer applications
6) To decompose a problem into functions and to develop modular reusable code
7) To apply File I/O operations

PROGRAMMING FOR PROBLEM SOLVING USING C LAB

Course Outcomes:

By the end of the Lab, the student
1) Gains Knowledge on various concepts of a C language.
2) Able to draw flowcharts and write algorithms.
3) Able design and development of C problem solving skills.
4) Able to design and develop modular programming skills.
5) Able to trace and debug a program

I Year II Semester

MATHEMATICS-II (Mathematical Methods)
Course Outcomes:

At the end of the course, the student will be able to

- develop the use of matrix algebra techniques that is needed by engineers for practical applications (L6)
- solve system of linear algebraic equations using Gauss elimination, Gauss Jordan, Gauss Seidel (L3)

- evaluate approximating the roots of polynomial and transcendental equations by different algorithms (L5)
- apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals (L3)
- apply different algorithms for approximating the solutions of ordinary differential equations to its analytical computations (L3)
-

MATHEMATICS-III

Course Outcomes:

At the end of the course, the student will be able to

- interpret the physical meaning of different operators such as gradient, curl and divergence (L5)
- estimate the work done against a field, circulation and flux using vector calculus (L5)
- apply the Laplace transform for solving differential equations (L3)
- find or compute the Fourier series of periodic signals (L3)
- know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms (L3)
- identify solution methods for partial differential equations that model physical processes (L3) .

FUNDAMENTALS OF COMPUTER SCIENCE

Course Outcomes:

On completion of the course the student will be able to
1. Explain the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming.

2. Recognize the Computer networks, types of networks and topologies.

3. Summarize the concepts of Operating Systems and Databases.

4. Recite the Advanced Computer Technologies like Distributed Computing & Wireless Networks.

ELECTRICAL CIRCUIT ANALYSIS -I
Course Outcomes:

Students are able to solve
• Various electrical networks in presence of active and passive elements.
• Electrical networks with network topology concepts.

• Any magnetic circuit with various dot conventions.
• Any R, L, C network with sinusoidal excitation.
• Any R, L, network with variation of any one of the parameters i.e., R, L, C and f.
• Electrical networks by using principles of network theorems.

ELECTRICAL ENGINEERING WORKSHOP
Course Outcomes:

On completion of the course the student will be able to
   • Explain the limitations, tolerances, safety aspects of electrical systems and wiring.
   • Select wires/cables and other accessories used in different types of wiring.
   • Make simple lighting and power circuits.
   • Measure current, voltage and power in a circuit

II Year I Semester

ELECTRICAL CIRCUIT ANALYSIS-II

Course Outcomes:

1. Students are able to solve three- phase circuits under balanced and unbalanced Condition
2. Students are able find the transient response of electrical networks for different types of excitations.
3. Students are able to find parameters for different types of network.
4. Students are able to realize electrical equivalent network for a given network transfer function.
5. Students are able to extract different harmonics components from the response of a electrical network.

ELECTRICAL MACHINES – I
Course Outcomes:

➢ Able to assimilate the concepts of electromechanical energy conversion.
➢ Able to mitigate the ill-effects of armature reaction and improve commutation in dc machines.
➢ Able to understand the torque production mechanism and control the speed of dc motors.
➢ Able to analyze the performance of single phase transformers.
➢ Able to predetermine regulation, losses and efficiency of single phase transformers.
➢ Able to parallel transformers, control voltages with tap changing methods and achieve three-phase to two-phase transformation.

ELECTROMAGNETIC FIELDS
Course Outcomes:

- To determine electric fields and potentials using guass's law or solving Laplace's or Possion's equations, for various electric charge distributions.
- To calculate and design capacitance, energy stored in dielectrics.
- To calculate the magnetic field intensity due to current, the application of ampere's law and the Maxwell's second and third equations.
- To determine the magnetic forces and torque produced by currents in magnetic field
- To determine self and mutual inductances and the energy stored in the magnetic field.
- To calculate induced e.m.f., understand the concepts of displacement current and poynting vector.
-

ELECTRICAL CIRCUITS LAB
Course Outcomes:

- Able to apply various thermos, determination of self and mutual inductances, two port parameters of a given electric circuits.
- Able to draw locus diagrams. Waveforms and phasor diagram for lagging and leading networks.

II Year II Semester

ELECTRICAL MEASUREMENTS

Course Outcomes:

- Able to choose right type of instrument for measurement of voltage and current for ac and dc.
- Able to choose right type of instrument for measurement of power and energy – able to calibrate energy meter by suitable method
- Able to calibrate ammeter and potentiometer.
- Able to select suitable bridge for measurement of electrical parameters
- Able to use the ballistic galvanometer and flux meter for magnetic measuring instruments
- Able to measure frequency and phase difference between signals using CRO. Able to use digital instruments in electrical measurements.

ELECTRICAL MACHINES – II

Course Outcomes:

- Able to explain the operation and performance of three phase induction motor.
- Able to analyze the torque-speed relation, performance of induction motor and induction generator.
- Able to explain design procedure for transformers and three phase induction motors.
- Implement the starting of single phase induction motors.
- To perform winding design and predetermine the regulation of synchronous generators.

> ➢ Avoid hunting phenomenon, implement methods of staring and correction of power factor with synchronous motor.

CONTROL SYSTEMS
COS:
> ➢ Ability to derive the transfer function of physical systems and determination of over all transfer function using block diagram algebra and signal flow graphs.
> ➢ Capability to determine time response specifications of second order systems and to determine error constants.
> ➢ Acquires the skill to analyze absolute and relative stability of LTI systems using Routh's stability criterion and the root locus method.
> ➢ Capable to analyze the stability of LTI systems using frequency response methods.
> ➢ Able to design Lag, Lead, Lag-Lead compensators to improve system performance from Bode diagrams.
> ➢ Ability to represent physical systems as state models and determine the response. Understanding the concepts of controllability and observability.

ELECTRICAL MACHINES – I LABORATORY
Course Outcomes:

> ➢ To determine and predetermine the performance of DC machines and Transformers.
> ➢ To control the speed of DC motor.
> ➢ To achieve three phase to two phase transformation.

III Year – I SEMESTER
POWER SYSTEMS–II
Course Outcomes:

> ➢ Able to understand parameters of various types of transmission lines during different operating conditions.
> ➢ Able to understand the performance of short and medium transmission lines.
> ➢ Student will be able to understand travelling waves on transmission lines.
> ➢ Will be able to understand various factors related to charged transmission lines.
> ➢ Will be able to understand sag/tension of transmission lines and performance of line insulators.

SIGNALS & SYSTEMS
Course Outcomes:

At the end of this course the student will able to:
> ➢ Characterize the signals and systems and principles of vector spaces, Concept of orthgonality.
> ➢ Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform.
> ➢ Apply sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back.
> ➢ Understand the relationships among the various representations of LTI systems

- ➤ Understand the Concepts of convolution, correlation, Energy and Power density spectrum and their relationships.
- ➤ Apply z-transform to analyze discrete-time signals and systems..

PULSE AND DIGITAL CIRCUITS
COS:
After going through this course the student will be able to
- ➤ Design linear and non-linear wave shaping circuits.
- ➤ Apply the fundamental concepts of wave shaping for various switching and signal
- ➤ generating circuits.
- ➤ Design different multivibrators and time base generators.
- ➤ Utilize the non sinusoidal signals in many experimental research areas.

ELECTRICAL MACHINES – II LABORATORY
COS:
1. Able to assess the performance of single phase and three phase induction motors.
2. Able to control the speed of three phase induction motor.
3. Able to predetermine the regulation of three–phase alternator by various methods.
4. Able to find the Xd/ Xq ratio of alternator and asses the performance of three–phase
5. Synchronous motor.

III Year – II SEMESTER

POWER ELECTRONIC CONTROLLERS & DRIVES
Course Outcomes:

☐ After completion of the course, students will be able to:
- ➤ Explain the fundamentals of electric drive and different electric braking methods.
- ➤ Analyze the operation of three phase converter fed dc motors and four quadrant operations of dc motors using dual converters.
- ➤ Describe the converter control of dc motors in various quadrants of operation
- ➤ Know the concept of speed control of induction motor by using AC voltage controllers and voltage source inverters.
- ➤ Differentiate the stator side control and rotor side control of three phase induction motor..
- ➤ Explain the speed control mechanism of synchronous motors

POWER SYSTEM ANALYSIS
Course Outcomes:

- ➤ Able to draw impedance diagram for a power system network and to understand per unit quantities.
- ➤ Able to form aYbusand Zbusfor a power system networks.
- ➤ Able to understand the load flow solution of a power system using different methods.
- ➤ Able to find the fault currents for all types faults to provide data for the design of protective devices.
- ➤ Able to findthe sequence components of currents for unbalanced power system

network.
- ➢ Able to analyze the steady state, transient and dynamic stability concepts of a power system.

MICROPROCESSORS AND MICROCONTROLLERS
Course Outcomes:

- ➢ To be able to understand the microprocessor capability in general and explore the evaluation of microprocessors.
- ➢ To be able to understand the addressing modes of microprocessors
- ➢ To be able to understand the micro controller capability
- ➢ To be able to program mp and mc
- ➢ To be able to interface mp and mc with other electronic devices
- ➢ To be able to develop cyber physical systems

DATA STRUCTURES THROUGH C++
Course Outcomes:

- ➢ Distinguish between procedures and object oriented programming.
- ➢ Apply advanced data structure strategies for exploring complex data structures.
- ➢ Compare and contrast various data structures and design techniques in the area of Performance.
- ➢ Implement data structure algorithms through C++. • Incorporate data structures into the applications such as binary search trees, AVL and B Trees
- ➢ Implement all data structures like stacks, queues, trees, lists and graphs and compare their Performance and trade offs

POWER ELECTRONICS LAB
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Course Outcomes:

- ➢ Able to study the characteristics of various power electronic devices and analyze gate drive circuits of IGBT.
- ➢ Able to analyze the performance of single–phase and three–phase full–wave bridge converters with both resistive and inductive loads.
- ➢ Able to understand the operation of single phase AC voltage regulator with resistive and inductive loads.
- ➢ Able to understand the working of Buck converter, Boost converter, single–phase square wave inverter and PWM inverter.

IV Year – I SEMESTER

UTILIZATION OF ELECTRICAL ENERGY

Course Outcomes:

- Able to identify a suitable motor for electric drives and industrial applications
- Able to identify most appropriate heating or welding techniques for suitable

applications.
- Able to understand various level of illuminosity produced by different illuminating sources.
- Able to estimate the illumination levels produced by various sources and recommend the most efficient illuminating sources and should be able to design different lighting systems by taking inputs and constraints in view.
- Able to determine the speed/time characteristics of different types of traction motors.
- Able to estimate energy consumption levels at various modes of operation.

LINEAR IC APPLICATIONS
Course Outcomes:

- Design circuits using operational amplifiers for various applications.
- Analyze and design amplifiers and active filters using Op-amp.
- Diagnose and trouble-shoot linear electronic circuits.
- Understand the gain-bandwidth concept and frequency response of the amplifier configurations.
- Understand thoroughly the operational amplifiers with linear integrated circuits.

POWER SYSTEM OPERATION AND CONTROL
Course Outcomes:

- Able to compute optimal scheduling of Generators.
- Able to understand hydrothermal scheduling.
- Understand the unit commitment problem.
- Able to understand importance of the frequency.
- Understand importance of PID controllers in single area and two area systems.
- Will understand reactive power control and compensation for transmission line.

ELECTRICAL SIMULATION LAB
Course Outcomes:

- Able to simulate integrator circuit, differentiator circuit, Boost converter, Buck converter, full convertor and PWM inverter.
- Able to simulate transmission line by incorporating line, load and transformer models.
- Able to perform transient analysis of RLC circuit and single machine connected to
- infinite bus(SMIB).

IV Year – II SEMESTER

DIGITAL CONTROL SYSTEMS
Course Outcomes:

- The students learn the advantages of discrete time control systems and the "know how" of various associated accessories.
- The learner understand z–transformations and their role in the mathematical analysis
- of different systems(like Laplace transforms in analog systems).
- The stability criterion for digital systems and methods adopted for testing the same
- are explained.
- Finally, the conventional and state space methods of design are also introduced.

H.V.D.C. TRANSMISSION
Course Outcomes:

The student should be able to
- Learn different types of HVDC levels and basic concepts
- Know the operation of converters
- Acquire control concept of reactive power control and AC/DC load flow.
- Understand converter faults, protection and harmonic effects
- Design low pass and high pass filters

ELECTRICAL DISTRIBUTION SYSTEMS

Course Outcomes:

- Able to understand various factors of distribution system.
- Able to design the substation and feeders.
- Able to determine the voltage drop and power loss
- Able to understand the protection and its coordination.
- Able to understand the effect of compensation forp.f improvement.
- Able to understand the effect of voltage control.

MECHANICAL ENGINEERING (R19)

I Year - I Semester

Mathematics-I

Course Outcomes:

At the end of the course, the student will be able to

• utilize mean value theorems to real life problems (L3)

• solve the differential equations related to various engineering fields (L3)

• familiarize with functions of several variables which is useful in optimization (L3)

- Apply double integration techniques in evaluating areas bounded by region (L3)

- Students will also learn important tools of calculus in higher dimensions. Students will become familiar with 2- dimensional and 3-dimensional coordinate systems (L5)

I Year - I Semester

ENGINEERING PHYSICS

Course Outcomes:

The students will be able to

- Identify forces and moments in mechanical systems using scalar and vector techniques

- extend Newton 's second law for inertial and non-inertial frame of reference

- explain simple harmonic motion and damped harmonic motions.

I Year - I Semester

MATHEMATICS – II

Course Outcomes:

At the end of the course, the student will be able to

- develop the use of matrix algebra techniques that is needed by engineers for practical applications (L6)

- solve system of linear algebraic equations using Gauss elimination, Gauss Jordan, Gauss Seidel (L3)

- evaluate approximating the roots of polynomial and transcendental equations by different algorithms (L5)

- apply Newton 's forward & backward interpolation and Lagrange 's formulae for equal and unequal intervals (L3)

- apply different algorithms for approximating the solutions of ordinary differential equations to its analytical computations (L3)

I Year - I Semester

PROGRAMMING FOR PROBLEM SOLVING USING C

Course Outcomes:

 Upon the successful completion of this course

- To write algorithms and to draw flowcharts for solving problems

- To convert flowcharts/algorithms to C Programs, compile and debug programs

- To use different operators, data types and write programs that use two-way/ multi-way selection

- To select the best loop construct for a given problem
- To design and implement programs to analyze the different pointer applications
- To decompose a problem into functions and to develop modular reusable code
- To apply File I/O operations

I Year – II Semester

ENGLISH

Course Outcomes:

At the end of the module, the learners will be able to

- understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information
- ask and answer general questions on familiar topics and introduce oneself/others
- employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information
- recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs
- form sentences using proper grammatical structures and correct word forms

I Year - II Semester

ENIGINEERING MECHANICS

Course Outcomes:

Upon the completion of the course the student will learn

- The student should be able to draw free body diagrams for FBDs for particles and rigid bodies in plane and space and problems to solve the unknown forces, orientations and geometric parameters.
- He should be able to determine centroid for lines, areas and center of gravity for volumes and their composites.
- He should be able to determine area and mass movement of inertia for composite sections
- He should be able to analyze motion of particles and rigid bodies and apply the principles of motion, work energy and impulse – momentum.

I Year - II Semester

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Course Outcomes:

Upon the successful completion of this course:

• Analyse various electrical networks.

• Understand operation of DC generators,3-point starter and DC machine testing by Swinburne's Test and Brake test.

• Analyse performance of single-phase transformer and acquire proper knowledge and working of 3-phase alternator and 3-phase induction motors.

• Analyse operation of half wave, full wave bridge rectifiers and OP-AMPs.

• Understanding operations of CE amplifier and basic concept of feedback amplifier.

I Year - II Semester

ENGINEERING CHEMISTRY LAB

Course Outcomes:

Upon the successful completion of this course:

- The students entering into the professional course have practically very little exposure to lab classes.
- The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations; then they are exposed to a few instrumental methods of chemical analysis. Thus at the end of the lab course, the student is exposed to different methods of chemical analysis and use of some commonly employed instruments. They thus acquire some experimental skills

MECHANICAL ENGINEERING (R16)

II Year - I Semester

METALLURGY & MATERIALS SCIENCE

Course Outcomes:

Upon the successful completion of this course:

- To understand the basic fundamentals of Material science and Physical metallurgy.
- The basic concepts to be taught will help for the improvement, proper selection and effective utilization of materials which is essential to satisfy the ever increasing demands of the society.

II Year - I Semester

MECHANICS OF SOLIDS

Course Outcomes:

Upon the successful completion of this course:

- The students completing this course are expected to understand the basic terms like stress, strain, poissons ratio…etc and different stresses induced in beams, thin cylinders, thick cylinders, columns.
- Further, the student shall be able to understand the shear stresses in circular shafts.

II Year - I Semester

THERMODYNAMICS

Course Outcomes:

Upon the successful completion of this course:

- The student should be able to understand the basic concepts like thermodynamic system, its boundary and related fundamental definitions.
- Distinction between point function and path function shall be made with respect to energy, work and Heat.

II Year - I Semester

ELECTRICAL & ELECTRONICS ENGINEERING LAB

Course Outcomes:

Upon the successful completion of this course:

• Able to find out the efficiency of dc shunt machine without actual loading of the machine.

• Able to estimate the efficiency and regulation for different load conditions and power factors of single phase transformer with OC and SC test.

• Able to analyse the performance characteristics and to determine efficiency of DC shunt motor &3-phase induction motor.

• Able to pre-determine the regulation of an alternator by synchronous impedance method.

• Able to control the speed of dc shunt motor using speed control methods.

• Able to find out the characteristics of PN junction diode & transistor

• Able to determine the ripple factor of half wave & full wave rectifiers.

II Year – II Semester

KINEMATICS OF MACHINERY

Course Outcomes:

Upon the successful completion of this course:

- The students completing this course are expected to understand the nature and role of the kinematics of machinery, the mechanisms and machines.
- The course includes velocity and acceleration diagrams, analysis of mechanisms joints, Cams and their applications.
- It exposes the students to various kinds of power transmission devices like belt, rope , chain and gear drives and their working principles and their merits and demerits.

II Year – II Semester

PRODUCTION TECHNOLOGY

Course Outcomes:

Upon the successful completion of this course:

- Design patterns, Gating, runner and riser systems
- Select a suitable casting process based on the component
- Learn various arc and solid state welding processes and select a suitable process based on the application and requirements
- Understand various bulk deformation processes
- Understand various sheet metal forming and processing of plastics

II Year – II Semester

DESIGN OF MACHINE MEMBERS – I

Course Outcomes:

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

- Apply the design procedure to engineering problems, including the consideration of technical and manufacturing constraints.
- Select suitable materials and significance of tolerances and fits in critical design applications.
- Utilize design data hand book and design the elements for strength, stiffness and fatigue.
- Identify the loads, the machine members subjected and calculate static and dynamic stresses to ensure safe design.

II Year – II Semester

MACHINE DRAWING

Course Outcomes:

Upon successful completion of this course, student will be able to

- The student will acquire knowledge of fastening arrangements such as welding, riveting the different styles of attachment for shaft.
- The student also is enabled to prepare the assembly of various machine or engine components and miscellaneous machine components.

III Year – I Semester

DYNAMICS OF MACHINERY

Course Outcomes:

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

- Analyze stabilization of sea vehicles, aircrafts and automobile vehicles
- Compute frictional losses, torque transmission of mechanical systems.
- Analyze dynamic force analysis of slider crank mechanism and design of flywheel.
- Understand how to determine the natural frequencies of continuous systems starting from the general equation of displacement.
- Understand balancing of reciprocating and rotary masses

III Year – I Semester

METAL CUTTING & MACHINE TOOLS

Course Outcomes:

At the end of this course; the student will be able to

- Apply cutting mechanics to metal machining based on cutting force and power consumption.
- Operate lathe, milling machines, drill press, grinding machines, etc.
- Select cutting tool materials and tool geometries for different metals.
- Select appropriate machining processes and conditions for different metals.
- Learn machining economics.
- Design jigs and Fixtures for simple parts.
- Learn principles of CNC Machines

III Year – I Semester

DESIGN OF MACHINE MEMBERS– II

Course Outcomes:

At the end of this course the student will be able to

- The student will able to select the suitable bearing based on the application of the loads and predict the life of the bearing
- Design power transmission elements such as gears, belts, chains, pulleys, ropes, levers and power screws.
- Design of IC Engines parts.

III Year – I Semester

MACHINE TOOLS LAB

Course Outcomes:

Upon successful completion of this course, student will be able to

- The students can operate different machine tools with understanding of work holders and operating principles to produce different part features to the desired quality.

III Year – II Semester

METROLOGY

Course Outcomes:

At the end of this course the student will be able to

- Students will be able to design tolerances and fits for selected product quality.
- They can choose appropriate method and instruments for inspection of various gear elements and thread elements.
- They can understand the standards of length, angles, they can understand the evaluation of surface finish and measure the parts with various comparators.
- The quality of the machine tool with alignment test can also be evaluated by them

III Year – II Semester

INSTRUMENTATION & CONTROL SYSTEMS

Course Outcomes:

Upon the successful completion of this course

- After undergoing the course the student can select appropriate device for the measurement of parameters like temperature, pressure, speed, stress, humidity, flow velocity etc.,
- and justify its use through characteristics and performance.

III Year – II Semester

REFRIGERATION & AIR CONDITIONING

Course Outcomes:

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

- After undergoing the course the student should be in a position to analyze various refrigerating cycles and evaluate their performance.
- The student also should be able to perform cooling load calculations and select the appropriate process and equipment for the required comfort and industrial air-conditioning

III Year – II Semester

HEAT TRANSFER LAB

Course Outcomes:

Upon successful completion of this course, student will be able to

- The student should be able to evaluate the amount of heat exchange for plane, cylindrical & spherical geometries and should be able to compare the performance of extended surfaces and heat exchangers

MECHANICAL ENGINEERING (R16)

IV Year – I Semester

MECHATRONICS

Course Outcomes:

By the end of successful completion of this course, the students will be able to:

- After completion of this course, the student shall be able to use the various mechatronics systems devices and components in the design of electro mechanical systems.

IV Year – I Semester

CAD/CAM

Course Outcomes:

At the end of the course the student will be able to

- Describe the mathematical basis in the technique of representation of geometric entities including points, lines, and parametric curves, surfaces and solid, and the technique of transformation of geometric entities using transformation matrix

- Describe the use of GT and CAPP for the product development

- Identify the various elements and their activities in the Computer Integrated Manufacturing Systems.

IV Year – I Semester

FINITE ELEMENT METHODS

Course Outcomes:

Upon the successful completion of this course:

- Understand the concepts behind variational methods and weighted residual methods in FEM
- Identify the application and characteristics of FEA elements such as bars, beams, plane and isoparametric elements, and 3-D element .
- Develop element characteristic equation procedure and generation of global stiffness equation will be applied.
- Able to apply Suitable boundary conditions to a global structural equation, and reduce it to a solvable form.
- Able to identify how the finite element method expands beyond the structural domain, for problems involving dynamics, heat transfer, and fluid flow.

IV Year – I Semester

CAD/CAM LAB

Course Outcomes:

At the end of the course the student will be able to

- The student will be able to appreciate the utility of the tools like ANSYS or FLUENT in solving real time problems and day to day problems.
- Use of these tools for any engineering and real time applications

- Acquire knowledge on utilizing these tools for a better project in their curriculum as well as they will be prepared to handle industry problems with confidence when it matters to use these tools in their Employment

IV Year – II Semester

PRODUCTION PLANNING AND CONTROL

Course Outcomes:

- After completion of course, the student shall understand the principle of working, mechanism of metal removal in the various unconventional machining process. The student is able to identify the process parameters, their effect and applications of different processes.

IV Year – II Semester

AUTOMOBILE ENGINEERING

Course Outcomes:

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

- The student after undergoing the course, shall visualize the layout of an automobile and its systems like transmission, steering, suspension, braking, safety etc and should know the vehicle troubleshooting.

IV Year – II Semester

PRODUCTION PLANNING AND CONTROL

Course Outcomes:

At the end of course, Student can

- After completion of course, the student shall understand the principle of working, mechanism of metal removal in the various unconventional machining process. The student is able to identify the process parameters, their effect and applications of different processes.

IV Year – II Semester

PROJECT WORK

Course Outcomes:

Up on completion of the Project work, the student will be able to

• Apply all levels of Engineering knowledge in solving the Engineering problems.

• Work together with team spirit.

• Use Civil Engineering software at least one.

• Document the projects

POWER ELECTRONICS
I Year I Semester

ELECTRICAL MACHINE MODELING & ANALYSIS

COS:

At the end of the course, student will be able to
- Analyze the characteristics of different types of DC motors to design suitable controllers for different applications.
- Apply the knowledge of reference frame theory for AC machines to model the induction and Synchronous machines.
- Evaluate the steady state and transient behavior of induction and synchronous machines to propose the suitability of drives for different industrial applications
- Analyze the behavior of induction machines using voltage and torque equations

ANALYSIS OF POWER ELECTRONIC CONVERTERS

COS:
At the end of the course, student will be able to
- Describe and analyze the operation of AC-DC converters.
- Analyze the operation of power factor correction converters.
- Analyze the operation of three phase inverters with PWM control.
- Study the principles of operation of multi- level inverters and their applications.

POWER QUALITY AND CUSTOM POWER DEVICES
COS:

At the end of the course, student will be able to
- Identify the issues related to power quality in power systems.
- Address the problems of transient and long duration voltage variations in power systems.
- Analyze the effects of harmonics and study of different mitigation techniques.
- Identify the importance of custom power devices and their applications.
- Acquire knowledge on different compensation techniques to minimize power quality disturbances.

POWER ELECTRONICS SIMULATION LABORATORY
COS:

After completion of this course the students will be able to:

- To understand the operation of DC-DC converters, AC-DC converters, AC voltage regulators and DC-AC converters by simulation.

I Year II Semester

SWITCHED MODE POWER CONVERSION

COS:

At the end of the course, student will be able to
- Analyze operation and control of non-isolated and isolated switch mode converters.
- Design of non-isolated and isolated switch mode converters.
- Analyze operation and control of resonant converters.
- Feedback design of switch mode converters based on linearized models.

POWER ELECTRONIC CONTROL OF ELECTRICAL DRIVES

COS:

After the completion of the course, student will be able to
- Understand the concepts of scalar and vector control methods for drive systems.
- Analyze and design controllers and converters for induction motor, PMSM and BLDC drives.
- Select and implement proper control techniques for induction motor and PMSM for specific applications.
- Analyze and design control techniques and converters for SRM drives.

HYBRID ELECTRIC VEHICLES
COS:

After completion of this course the students will be able to:
- Know the concept of electric vehicles and hybrid electric vehicles.
- Familiar with different motors used for hybrid electric vehicles.
- Understand the power converters used in hybrid electric vehicles
- Know different batteries and other energy storage systems.

ELECTRIC DRIVES SIMULATION LABORATORY
COS:

After completion of this course the students will be able to:

- The student should analyze the performance of different electrical machines and drives

Principles of Management:
Course Outcomes:

- Extract Managerial skills of the students
- Identify the external and internal factors that influence on organizational structure behaviours
- Analyze how an organization's leaders/managers utilize job design, positional power, and goal setting/performance management to motivate employees.
- Identify leadership characteristics that produce high performing organizations.
- Gather and analyze both qualitative and quantitative information to isolate issues and formulate best controlling Techniques

Managerial Economics:
Course Outcomes:

- Able to understand the concepts of managerial economics
- To express the different aspects of Demand, Elasticity of demand and Demand forecasting
- Able to understand and analyze Market Structure and Pricing practices
- Apply the concepts of Macro economics in the organizational systems and acquire the knowledge of World economic policy

Accounting for Managers:
Course Outcomes:

- Understand & Apply Generally Accepted Accounting Principles (GAAP)
- Prepare the financial statements of sole proprietary concern
- Analyze the financial statements with the help of different financial techniques
- Understand the cost sheet & preparation of cost sheet.
- Apply CVP analysis in business decisions.

Managerial Communication & Soft Skills:
Course Outcomes:

- Apply appropriate communication skills across settings, purposes, and audiences. Use technology to communicate effectively in various settings and contexts.
- How to convey a credible message and create concise messages using a structured writing process and write business documents that are grammatically correct and use appropriate business style.
- Develop effective intra and interpersonal communication skills to analyze communication situations (case study) and audiences and make choices about the most effective and efficient way to communicate and deliver messages

- Deliver effective business presentations in contexts that may require either extemporaneous or impromptu oral presentations.

Business Environment:
Course Outcomes:

- Understand the nature, Scope and structure of business environment
- Illustrate the role of different state government agencies to build the business organization
- Understand the various policy perspectives in national and international regulatory environment
- Analyze the influence of various environmental factors on global business organization

Operations Research for Business Decision:
Course Outcomes:

- Calculate descriptive statistical measures and appreciate the uses and limitations of the measures. Understand and apply correlation analysis and predicting regression analysis.
- Formulate a given simplified description of a suitable real world problem as a linear programming model
- Solve the transportation problem, and assignment problems to drive their optimal solution.
- Identify the resources required for a project and generate a plan and work schedule.
- Understand the basic principles of decision theory, Apply various decision criteria, and use decision trees to assist in sequential decisions.

Information Technology Lab:
Course Outcomes:

- Understand the basics of computer
- Analyze the financial data
- Calculation of statistical data
- Tabulation and analyzing techniques
- Preparation and presentation of the data

Employability Skills-I:
Course Outcomes:

- To enable the students to give a brief description about himself/herself in public.
- The students should develop a positive attitude, body language, confidence and motivation required content presentation.
- Give a standard oral presentation which informs and/or persuades the audience.
- Students should have knowledge on upkeep of surrounding and should be trained on how to maintain it.
- The students should develop a positive attitude and behavior; they should be motivated for team participation at work, anger management skills.

Financial Management:
Course Outcomes:

- Describe & Apply different concepts related to financial management
- Apply financing decisions in practice
- Analyze the different techniques of capital budgeting decisions
- Understand & Analyze the working capital management.
- Estimate working capital requirement of Business concern

Human Resource Management:
Course Outcomes:

- Infer the concept and framework of human resource management
- Understanding the concepts related to HR procurement including recruitment and selection, HRP and Training and development
- Integrate the importance of performance appraisal and compensation and its correlation with employee retention
- Provide better understanding of using HRD practices as competitive tool for organizational excellence

Marketing Management:
Course Outcomes:

- Identify core concepts of marketing
- Knowledge of social, legal, ethical and technological forces
- Create an integrated marketing communications
- Analyze marketing problems and provide solutions
-

Production and Operations Management:
Course Outcomes:

- Understand the core features of the operations and production management function at the operational and strategic levels, specifically the relationships between people, process, technology, productivity and quality and how it contributes to the competitiveness of firms.
- 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)
- Students will develop an integrated framework for strategic thinking and decision making to analyze the enterprise as a whole with a specific focus on the wealth creation processes

- Students Develop the ability to identify operational methodologies to assess and improve an organizations performance
- To develop an understanding on how to create a production entity with focus on - Production Base, Financial (Cost) Performance, Technical and Operational capabilities, Human Capabilities

Business Research Methodology:

Course Outcomes:

- Understand and apply the major types of research designs
- Be able to formulate and present effective research reports
- Formulate clearly defined research questions
- Clearly identify and analyse business problems and identify appropriate and effective ways to answer those problems
- Analyse and summarise key issues and themes from existing literature

Organizational Behavior:
Course Outcomes:

- Understand the fundamentals of organizational behavior by getting acquainted to the concepts related to individual and interpersonal processes.
- Use of different theories of motivation, leadership and change management in practice
- Evaluate and classify various types of organizational structure and culture
- To analyze the human behavior in sociological and psychological perspectives

Employability Skills-II:

Course Outcomes:

- Improve Comprehension & Fluency of Speech.
- Development of Time Management Skills.
- Gather ideas and information, to organize ideas relevantly and coherently.
- Engage in debates
- Use English Language, both written & spoken, competently & correctly

2nd Year MBA Semester-I Course Outcomes (R-16)

Strategic Management:
Course Outcomes:

- Describe the practical and integrative model of strategic management process that defines basic activities in strategic management
- Appraise the resources and capabilities of the firm in terms of their ability to confer sustainable competitive advantage and formulate strategies that leverage a firm's core

competencies.

- Analyze the main structural features of an industry and develop strategies that position the firm most favourably in relation to competition and influence industry structure to enhance industry attractiveness.
- Analyze the competitive situation and strategic dilemma in dealing with dynamic global business environment in terms of rapidly changing market trends and technological advancement and evaluate challenges faced by managers in implementing and evaluating strategies based on the nature of business, industry, and cultural differences
- Able to develop strategic controls for a given enterprise or suggest modifications to existing strategic management systems

Legal Aspects of Business:
Course Outcomes:

- To understand contract act and sales of goods act.
- To have a basic understanding of the laws relating to consumer protection, companies and dispute resolution.
- To acquire the knowledge about contract of agency and Indian partnership act.
- To develop the knowledge about the recent acts such as environmental protection act and goods and services tax.
- To apply the concepts of information technology act in real world business.

Business Ethics & Corporate Governance:
Course Outcomes:

- To Help Students to learn the overview of Business Ethics and its impact on business.
- To Promote understanding of the importance ethics in business and to show the impact of unethical practices
- To Provide the skills with which to recognize and resolve ethical issues in business;

Product Management (MARKETING):
Course Outcomes:

- Understand the basic concepts product and product life cycle.
- Learn marketing strategies and customer analysis.
- Understand the brand and concepts of branding.
- Understand brand building and launch management.
- Understand concepts in packaging and trends in packaging.

Promotion and Distribution Management (MARKETING):
Course Outcomes:

- Aid students to put on the practical disclosure on promotion and distribution

management.

- Understand the importance of designing of channels of distribution and problems in channel selection.
- Apply the concepts of promotional strategies and logistics functions
- Gain knowledge of ethical and social issues in distribution management.
- students will understand national and international distribution institutions .

Investment Analysis and Portfolio Management (FIN) (ELECTIVE):

Course Outcomes:

- Meet the needs of students who want to pursue career in the investment field, use the various alternatives available for investment.
- Find the relationship between risk and return and learn to measure risk and return and adopt the same in the real life situations.
- Valuate the equities and bonds.
- Undertake the tasks of investment analysis and portfolio analysis
- Adopt and apply portfolio evaluation models for the realistic situations

Banking and Insurance Management (FIN) (ELECTIVE):
Course Outcomes:

- The students will also develop a critical knowledge and understanding core theories of Banking
- Familiarize Students' with insurance services and its companies.
- Help Students to learn the overview of financial institutions and services

Compensation and Performance Management (HR) (ELECTIVE):
Course Outcomes:

- Determine concepts of compensation and designing of effective compensation system.
- Understand Wages and various concepts of Wage payments.
- Understand administration of wage and salary.
- Determine effectiveness of performance management in an organization.
- Analyze concept of performance appraisal for reward and recognition

Management of Industrial Relations (HR) (ELECTIVE):
Course Outcomes:

- Apply the essential concepts of industrial relations and their interrelationship at the personal, organizational and national levels.
- Recognize and consider the social, historical and equity issues within industrial

relations.
- Investigate solutions to industrial relations problems based on research and assessment of current practices.
- Communicate their knowledge of industrial relations in both written and verbal formats reactive to both audience and purpose to solve grievances.
- To distinguish the procedure concerning worker participation and participatory

2nd Year MBA Semester-II Course Outcomes (R-16)

Logistic and Supply Chain Management:
Course Outcomes:

- Acquires knowledge of the functional components within logistics to the interrelationships in the integrated supply chain.
- Knows Difference between logistics and supply chain management & gain knowledge on Benchmarking.
- Learns the logistics technology tools and resources, in order to comply with the requirements of logistics/supply chain management.
- Evaluate and select warehousing and transportation options and recommend appropriate solutions for business requirement.
- Understands how technology has and continues to change logistics and supply chain management.

Entrepreneurship Development:
Course Outcomes:

- Give an outline of Entrepreneurship
- Explain the concept of entrepreneurship and Women entrepreneurship
- Extract the essence of entrepreneurial motivation
- Elucidate the problems of women entrepreneurship
- Debate on Entrepreneurship

Services Marketing:
Course Outcomes:

- Give an outline of Entrepreneurship
- Explain the concept of entrepreneurship and Women entrepreneurship
- Extract the essence of entrepreneurial motivation
- Elucidate the problems of women entrepreneurship
  Debate on Entrepreneurship

Consumer Behavior:
Course Outcomes:

- Understand consumer behaviour, models and learning process.
- Analyze consumer attitude formation, change and consumer communication.
- Understand psychological factors affecting consumer behaviour and post purchase process.
- Understand consumerism and consumer protection acts.
- Understand consumer information, privacy and dispute redressal commission

International Financial Management:
Course Outcomes:

- Demonstrate the understanding of international financial theory and
- To illustrate applications pertaining to, e.g., exchange rate determinants, foreign exchange exposure, foreign direct investment, interest rate parity, and the balance of payment.
- Develop a frame of reference through which to identify, evaluate, and solve problems pertaining to international financial management.
- Develop critical and analytical skills and the ability to international financing
- Illustrate the international taxation methods and management of External Indebtness.

Financial Risk Management:
Course Outcomes:

- Will learn to apply risk management concepts in present business situations.
- The student able to know the case studies, it will identify the lessons learned from some of major corporate collapses.
- Learners will research typical risk factors and treatment options in a specialist area of their choice.
- Learner able to know the Regulatory and Other Issues in Risk Management areas.
- It will provide learners with the opportunity to undertake the equivalent of a risk management consulting assignment and apply their new knowledge to real-life business situations.

Global Human Resource Management:
Course Outcomes:

a. Able to demonstrate across a broad knowledge of HRM strategies, Policies and practices across a range of cultural and nations.
b. To Understand and identify the differences between the intentional and domestic dimension of the operational aspects of HRM including recruitment and selection, training and development, payment systems, performance management and industrial relations.
c. To Demonstrate and understand the management of expatriate employees and the problems that confront expatriate management
d. To analyze and apply international HRM concepts in relation to global ethical

issues in the work place
e. Enhance their critical thinking, theorizing and synthesizing abilities and apply them to problem solving in the field of managing people internationally and domestically

Management of Change and Development:
Course Outcomes:

- Explain the relevance of a range of change management approaches and models to a variety of situations where appropriate
- Identify and apply a range of skills relevant to the change management process
- Articulate and demonstrate understanding of the management competencies needed in this area
- Use diagnostic tools and models to explore underlying organizational and behavioural issues that may affect the change process
- Display a clear understanding of the role of 'change agents' and its applicability in organizational settings