CIVIL ENGINEERING (R16)

I Year - I Semester

MATHEMATICS – I

Course Outcomes:

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

- Solve linear differential equations of first, second and higher order.
- Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE.
- Calculate total derivative, Jocobian and minima of functions of two variables.

I Year - I Semester

COMPUTER PROGRAMMING

Course Outcomes:

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

• Understand the basic terminology used in computer programming

• Write, compile and debug programs in C language.

• Use different data types in a computer program.

• Design programs involving decision structures, loops and functions.

• Explain the difference between call by value and call by reference

• Understand the dynamics of memory by the use of pointers

• Use different data structures and create/update basic data files.

I Year - I Semester

ENVIRONMENTAL STUDIES

Course Outcomes:

The student should have knowledge on

• The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources

• 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

• The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity

• Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices

• Social issues both rural and urban environment and the possible means to combat the challenges • The environmental legislations of India and the first global initiatives towards sustainable development.

• About environmental assessment and the stages involved in EIA and the environmental audit.

• Self Sustaining Green Campus with Environment Friendly aspect of – Energy, Water and Wastewater reuse Plantation, Rain water Harvesting, Parking Curriculum.

I Year - I Semester

COMPUTER PROGRAMMING LAB

Course Outcomes:

Upon the successful completion of this course

• Apply and practice logical ability to solve the problems.

• Understand C programming development environment, compiling, debugging, and linking and executing a program using the development environment

• Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs

• Understand and apply the in-built functions and customized functions for solving the problems.

• Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.

• Document and present the algorithms, flowcharts and programs in form of user-manuals

•Identification of various computer components, Installation of software

I Year – II Semester

MATHEMATICS-II (Mathematical Methods)

Course Outcomes:

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

- Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators.

- Compute interpolating polynomial for the given data.
- Solve ordinary differential equations numerically using Euler's and RK method.
- Find Fourier series and Fourier transforms for certain functions.
- Identify/classify and solve the different types of partial differential equations.

I Year - II Semester

MATHEMATICS – III

Course Outcomes:

Upon the successful completion of this course:

- Determine rank, Eigenvalues and Eigen vectors of a given matrix and solve simultaneous linear equations.
- Solve simultaneous linear equations numerically using various matrix methods.
- Determine double integral over a region and triple integral over a volume.
- Calculate gradient of a scalar function, divergence and curl of a vector function.
- 5.Determine line, surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals.

I Year - II Semester

ELEMENTS OF MECHANICAL ENGINEERING

Course Outcomes:

Upon the successful completion of this course:

• After completing the course, the student shall be able to understand the applications of different mechanical elements and manufacturing processes.

• The performance of components like Boiler, I.C Engine, Compressors.

• Power transmission by belt, rope, chain and gear trains.

I Year - II Semester

ENGINEERING WORKSHOP & IT WORKSHOP

Course Outcomes:

Upon the successful completion of this course:

• Common understanding of concepts, patterns of decentralization implementation in Africa

• Identified opportunities for coordinated policy responses, capacity building and implementation of best practices

• Identified instruments for improved decentralization to the local level

• Identified strategies for overcoming constraints to effective decentralization and sustainable management at different levels

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 (R13)

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

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.
- Apply the gained knowledge to project management and construction techniques.

IV Year – I Semester

ENVIRONMENTAL ENGINEERING LAB

Course Outcomes:

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

- Estimation some important characteristics of water and wastewater in the laboratory.
- Draw some conclusion and decide whether the water is potable or not.
- Decide whether the water body is polluted or not with reference to the state parameters in the list of experiments.
- Estimation of the strength of the sewage in terms of BOD and COD.

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

ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT

Course Outcomes:

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

- Prepare EMP, EIS, and EIA report
- Identify the risks and impacts of a project
- Selection of an appropriate EIA methodology
- Evaluation the EIA report
- Estimate the cost benefit ratio of a project
- Know the role of stakeholder and public hearing in the preparation of EIA

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.

ELECTRICAL & ELECTRONICS ENGINEERING

I Year I Semester

ENGLISH – I

COS:

1. Using English languages, both written and spoken, competently and correctly.
2. Improving comprehension and fluency of speech.
3. Gaining confidence in using English in verbal situations.

MATHEMATICS-I

COS:

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.

COMPUTER PROGRAMMING

COS:

- Understand the basic terminology used in computer programming
- Write, compile and debug programs in C language.
- Use different data types in a computer program.
- Design programs involving decision structures, loops and functions.
- Explain the difference between call by value and call by reference
- Understand the dynamics of memory by the use of pointers
- Use different data structures and create/update basic data files.

COMPUTER PROGRAMMING LAB

COS:

- Apply and practice logical ability to solve the problems.
- Understand C programming development environment, compiling, debugging, and linking and executing a program using the development environment
- Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs
- Understand and apply the in-built functions and customized functions for solving the problems.
- Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.
- Document and present the algorithms, flowcharts and programs in form of user-manuals
- Identification of various computer components, Installation of software

I Year II Semester

MATHEMATICS-II (Mathematical Methods)
COS:

At the end of the Course, Student will be able to:
1. Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators.
2. Compute interpolating polynomial for the given data.
3. Solve ordinary differential equations numerically using Euler's and RK method.
4. Find Fourier series and Fourier transforms for certain functions.
5. Identify/classify and solve the different types of partial differential equations

MATHEMATICS-III

COS:
At the end of the Course, Student will be able to:
1. Determine rank, Eigen values 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.
5. Determine line, surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals.

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ELECTRICAL CIRCUIT ANALYSIS -I
COS:
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.

II Year I Semester

ELECTRICAL CIRCUIT ANALYSIS-II
COS:
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
COS:

- 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
COS:

- 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
COS:

- 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
COS:

- 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
COS:

- 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

COS:

- 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
COS:

- 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
COS:
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

COS:

 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

COS:

- 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

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COS:

- 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++

COS:

- 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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COS:

- 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

HVAC & DC TRANSMISSION

COS:

- To be able to acquaint with HV transmission system with regard to power handling capacity, losses, conductor resistance and electrostatic field associate with HV. Further knowledge is gained in area of bundle conductor system to improve electrical and mechanical performance.
- To develop ability for determining corona, radio interference, audible noise generation and frequency spectrum for single and three phase transmission lines.

- To be able to acquire knowledge in transmission of HVDC power with regard to terminal equipments, type of HVDC connectivity and planning of HVDC system.
- To be able to develop knowledge with regard to choice of pulse conversion, control characteristic, firing angle control and effect of source impedance.
- To develop knowledge of reactive power requirements of conventional control, filters and reactive power compensation in AC. side of HVDC system.
- Able to calculate voltage and current harmonics, and design of filters for six and twelve pulse conversion.

POWER SYSTEM OPERATION AND CONTROL
COS:

- 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 line power compensation.

MICROPROCESSORS AND MICROCONTROLLERS LAB
COS:

- Will be able to write assembly language program using 8086 micro based on arithmetic, logical, and shift operations.
- Will be able to do modular and Dos/Bios programming using 8086 micro processor.
- Will be able to interface 8086 with I/O and other devices.
- Will be able to do parallel and serial communication using 8051 micro controllers.

ELECTRICAL SIMULATION LAB

COS:

- 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).
- Able to find load flow solution for a transmission network with Newton–Rampson method.

IV Year – II SEMESTER

DIGITAL CONTROL SYSTEMS
COS:

- The students learn the advantages of discrete time control systems and the “know how” of various associated accessories.
- The learner understands 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.

FLEXIBLE ALTERNATING CURRENT TRANSMISSION SYSTEMS

COS:

The student should be able to

- Determine power flow control in transmission lines by using FACTS controllers.
- Explain operation and control of voltage source converter.
- Discuss compensation methods to improve stability and reduce power oscillations in the transmission lines.
- Explain the method of shunt compensation by using static VAR compensators.
- Appreciate the methods of compensations by using series compensators.
- Explain the operation of modern power electronic controllers (Unified Power Quality Conditioner and Interline Power Flow Controller).

MECHANICAL ENGINEERING (R16)

I Year - I Semester

MATHEMATICS – I

Course Outcomes:

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

- Solve linear differential equations of first, second and higher order.
- Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE.
- Calculate total derivative, Jocobian and minima of functions of two variables.

I Year - I Semester

COMPUTER PROGRAMMING

Course Outcomes:

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

• Understand the basic terminology used in computer programming

• Write, compile and debug programs in C language.

• Use different data types in a computer program.

• Design programs involving decision structures, loops and functions.

• Explain the difference between call by value and call by reference

• Understand the dynamics of memory by the use of pointers

• Use different data structures and create/update basic data files.

I Year - I Semester

ENVIRONMENTAL STUDIES

Course Outcomes:

The student should have knowledge on

• The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources

• 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

• The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity

• Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices

• Social issues both rural and urban environment and the possible means to combat the challenges • The environmental legislations of India and the first global initiatives towards sustainable development.

• About environmental assessment and the stages involved in EIA and the environmental audit.

• Self Sustaining Green Campus with Environment Friendly aspect of – Energy, Water and Wastewater reuse Plantation, Rain water Harvesting, Parking Curriculum.

I Year - I Semester

COMPUTER PROGRAMMING LAB

Course Outcomes:

Upon the successful completion of this course

• Apply and practice logical ability to solve the problems.

• Understand C programming development environment, compiling, debugging, and linking and executing a program using the development environment

• Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs

• Understand and apply the in-built functions and customized functions for solving the problems.

• Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.

• Document and present the algorithms, flowcharts and programs in form of user-manuals

•Identification of various computer components, Installation of software

I Year – II Semester

MATHEMATICS-II (Mathematical Methods)

Course Outcomes:

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

- Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators.
- Compute interpolating polynomial for the given data.
- Solve ordinary differential equations numerically using Euler's and RK method.
- Find Fourier series and Fourier transforms for certain functions.
- Identify/classify and solve the different types of partial differential equations.

I Year - II Semester

MATHEMATICS – III

Course Outcomes:

Upon the successful completion of this course:

- Determine rank, Eigenvalues and Eigen vectors of a given matrix and solve simultaneous linear equations.
- Solve simultaneous linear equations numerically using various matrix methods.
- Determine double integral over a region and triple integral over a volume.
- Calculate gradient of a scalar function, divergence and curl of a vector function.
- 5.Determine line, surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals.

I Year - II 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 DC machine testing by Swinburne's Test.

• Able to analyse the performance of single-phase 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 bridge rectifiers and OP-AMPs.

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

I Year - II Semester

ENGINEERING WORKSHOP & IT WORKSHOP

Course Outcomes:

Upon the successful completion of this course:

• Common understanding of concepts, patterns of decentralization implementation in Africa

• Identified opportunities for coordinated policy responses, capacity building and implementation of best practices

• Identified instruments for improved decentralization to the local level

• Identified strategies for overcoming constraints to effective decentralization and sustainable management at different levels

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 (R13)

IV Year – I Semester

AUTOMOBILE ENGINEERING

Course Outcomes:

By the end of 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 – 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, the students will be able to:

- 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

SIMULATION LAB

Course Outcomes:

Upon the successful completion of this course, the students 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

GREEN ENGINEERING SYSTEMS

Course Outcomes:

Upon the successful completion of this course:

- The student shall understand the principles and working of solar, wind, biomass, geo thermal, ocean energies and green energy systems and appreciate their significance in view of their importance in the current scenario and their potential future applications.

IV Year – II Semester

PRODUCTION PLANNING AND CONTROL

Course Outcomes:

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

- Apply the systems concept for the design of production and service systems.
- Make forecasts in the manufacturing and service sectors using selected quantitative and qualitative techniques.
- Apply the principles and techniques for planning and control of the production and service systems to optimize/make best use of resources.
- Understand the importance and function of inventory and to be able to apply selected techniques for its control and management under dependent and independent demand circumstances.

IV Year – II Semester

PROJECT WORK

Course Outcomes:

At the end of course, Student can

- After completing the project work the student should learn the technical procedure of planning, scheduling and realizing an engineering product

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

1. Mathematically model the random phenomena and solve simple probabilistic problems.
2. Identify different types of random variables and compute statistical averages of these random variables.
3. Characterize the random processes in the time and frequency domains.
4. Analyze the LTI systems with random inputs.
5. 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.

COMPUTER SCIENCE ENGINEERING (R 16)

I Year - I Semester

MATHEMATICS-II (Mathematical Methods)

Course Outcomes:

CO1. Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators.

CO 2. Compute interpolating polynomial for the given data.

CO 3. Solve ordinary differential equations numerically using Euler's and RK method.

CO 4. Find Fourier series and Fourier transforms for certain functions.

CO 5. Identify/classify and solve the different types of partial differential equations

COMPUTER PROGRAMMING

Course Outcomes:

CO1. Understand the basic terminology used in computer programming

CO 2. Write, compile and debug programs in C language.

CO 3. Use different data types in a computer program.

CO 4. Design programs involving decision structures, loops and functions.

CO 5. Explain the difference between call by value and call by reference

CO 6. Understand the dynamics of memory by the use of pointers

CO 7. Use different data structures and create/update basic data files.

COMPUTER PROGRAMMING LAB

Course Outcomes:

CO 1. Apply and practice logical ability to solve the problems.

CO 2. Understand C programming development environment, compiling, debugging, and linking and executing a program using the development environment

CO 3. Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs

CO 4. Understand and apply the in-built functions and customized functions for solving the problems.

CO 5. Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.

CO 6. Document and present the algorithms, flowcharts and programs in form of user-manuals

CO 7. Identification of various computer components, Installation of software

I Year - II Semester

APPLIED CHEMISTRY

Course Outcomes:

CO 1. The advantages and limitations of plastic materials and their use in design would be understood.

CO 2. Fuels which are used commonly and their economics, advantages and limitations are discussed.

CO 3. The students would be now aware of materials like nano-materials and fullerenes and their uses.

CO 4. The importance of green synthesis is well understood and how they are different from conventional methods is also explained.

CO 5. Conductance phenomenon is better understood. The students are exposed to some of the alternative fuels and their advantages and limitations.

OBJECT-ORIENTED PROGRAMMING THROUGH C++

Course Outcomes:

CO 1. Understand the basic terminology used in computer programming

CO 2. Write, compile and debug programs in C language. Use different data types in a computer program.

CO 3. Design programs involving decision structures, loops and functions.

CO 4. Explain the difference between call by value and call by reference

ENVIRONMENTAL STUDIES

Course Outcomes:

CO 1. Overall understanding of the natural resources

CO 2. Basic understanding of the ecosystem and its diversity

CO 3. Acquaintance on various environmental challenges induced due to unplanned anthropogenic activities

CO 4. An understanding of the environmental impact of developmental activities

CO 5. Awareness on the social issues, environmental legislation and global treaties

ENIGINEERING MECHANICS

Course Outcomes:

CO 1. Attain knowledge to the concepts of force and friction, direction and its application.

CO 2. Apply free body diagrams and solve problems using graphical methods and law of triangle of forces.

CO 3. Understand the concepts of moment of inertia and polar moment of inertia including transfer methods and their applications.

CO 4. Understand the motion in straight line and in curvilinear paths, its velocity and acceleration computation and methods of representing plane motion.

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

II Year – II SEMESTER

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.

IV Year – I SEMESTER (R 13)

ADVANCED DATABASES

Course Outcomes:

CO 1. Identify, describe, and categorize database objects

CO 2. Design and implement advanced queries using Structured Query Language

CO 3. Design, construct and maintain a database and various database objects using procedural language constructs, forms and reports to solve problems

CO 4. Administer a database by recommending and implementing procedures including database tuning, backup and recovery

CO 5. Propose, implement and maintain database security mechanisms

CO 6. Explore non-relational database systems and structures

UML & DESIGN PATTERNS

Course Outcomes:

CO 1. Identify the purpose and methods of use of common object-oriented design patterns

CO 2. Select and apply these patterns in their own designs for simple programs

CO 3. Represent the data dependencies of a simple program using UML

CO 4. Represent user and programmatic interactions using UML

CO 5. Create design documentation outlining the testable and complete design of a simple program

CO 6. Produce and present documents for the purpose of capturing software requirements and specification

CO 7. Produce plans to limit risks specific to software designed for use in a particular social context

CRYPTOGRAPHY AND NETWORK SECURITY

Course Outcomes:

CO 1. To be familiarity with information security awareness and a clear understanding of

its importance.

CO 2. To master fundamentals of secret and public cryptography

CO 3. To master protocols for security services

CO 4. To be familiar with network security threats and countermeasures

CO 5. To be familiar with network security designs using available secure solutions

ARTIFICIAL INTELLIGENCE

Course Outcomes:

CO1. 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

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

IV Year – II SEMESTER (R 13)

HUMAN COMPUTER INTERACTION

Course Outcomes:

CO 1. Explain the capabilities of both humans and computers from the viewpoint of human information processing.

CO 2. Describe typical human–computer interaction (HCI) models, styles, and various historic HCI paradigms.

CO 3. Apply an interactive design process and universal design principles to designing HCI systems.

CO 4. Describe and use HCI design principles, standards and guidelines.

CO 5. Analyze and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems.

CO 6. Discuss tasks and dialogs of relevant HCI systems based on task analysis and dialog design.

ADVANCED OPERATING SYSTEMS

Course Outcomes:

1. Outline the potential benefits of distributed systems

2. Summarize the major security issues associated with distributed systems along with the

3. Range of techniques available for increasing system security

MICROPROCESSORS AND MULTI CORE SYSTEMS

Course Outcomes:

CO 1. Able to solve basic binary math operations using the microprocessor.

CO 2. Able to demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor.

CO 3. Able to program using the capabilities of the stack, the program counter, and the status register and show how these are used to execute a machine code program.

CO 4. Able to apply knowledge of the microprocessor’s internal registers and operations by use of a PC based microprocessor simulator.

CO 5. Able to write assemble assembly language programs, assemble into machine a cross assembler utility and download and run their program on the training boards.

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

MTECH (POWER ELECTRONICS)
I Year I Semester

ELECTRICAL MACHINE MODELING & ANALYSIS

COS:

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

- Apply knowledge of behaviour of DC motors to model and analyse for different applications.
- Analyse the characteristics of different types of DC motors to design suitable controllers
- Apply the knowledge of reference frame theory for AC machines to model the induction and synchronous machines.
- Evaluate the steady state and transient behaviour of induction and synchronous machines to Propose the suitability of drives for different industrial applications
- Analyse the 2-Phase induction machines using voltage and torque equations to differentiate the behaviour and to propose their applications in real world.

ANALYSIS OF POWER ELECTRONIC CONVERTERS

COS:

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

- Analyze the operation of phase controlled converters and AC voltage converters.
- Analyze the requirements of power factor correction in converter circuits.
- Describe and analyse the operation of 3-phase inverters with and without PWM techniques.
- Describe principles of operation and features of multilevel inverters.

POWER ELECTRONIC CONTROL OF DC DRIVES

COS:

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

- Analyse single phase and three phase converter fed DC drives.

- Analyse the two quadrants and four quadrant controls of DC motor drives.
- Develop the mathematical models of DC drive components.
- Analyse the four quadrant and closed loop control of DC-DC converter fed DC drive

SIMULATION LABORATORY

COS:

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

- Analyse the characteristics of power semiconductor devices in simulation.
- Analyse the operation of various power electronic converters in simulation.
- Analyse and implementing the speed controlling techniques for AC machines in simulation.
- Analyse and implementing PWM techniques in simulation.

I Year II Semester

SWITCHED MODE POWER CONVERSION

COS:

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

- Analyse the control operation of non-isolated switch mode converters.
- Analyse the operation of resonant converters and soft switching.
- Analyse the operation of isolated switch mode converters.
- Analyse the control schemes for resonant converters and design of magnetic components.
- Analyse the design of non-isolated switch mode converters based on linearization.
- Analyse the switch mode converters with small signal analysis.

POWER ELECTRONIC CONTROL OF AC DRIVES

COS:

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

- Explain operation of induction motor and analyse speed control of AC drivesbyVSIfed drives.
- Understand vector control of induction motors.
- Understand operation of traction drives.
- Analyse control schemes to synchronous motor drives.
- Understand control of switched reluctance motor & stepper motor.

CUSTOM POWER DEVICES

COS:

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

- Analyse the effect of various power quality issues in distribution system and their mitigation principles.
- Describe the operation of custom power devices for reactive power & harmonic compensation.
- Analyse high speed transfer switches.
- Analyse the operation and control of custom power devices in power system applications.

POWER CONVERTERS AND DRIVES LAB

COS:

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

- To analyse the working of phase controlled converters, AC voltage controllers, DC-DC converters, and PWM inverters and analyse the speed control operation of power converter fed motors.