JSPM's Bhivarabai Sawant Institute of Technology and Research,Wagholi,Pune

CO of All Courses

Department of Engineering Science(First Year)
Semester: I & II
Subject(Course Name) and Code: Engineering Maths – I 107001
Course Outcomes
CO1:Explain the solution of system of linear equations by matrix method, orthogonality of linear transformation and Eigen values, Eigen vectors, essential in various engineering problems. CO2:Explain the solution of algebraic equation by De-Movires theorem and separate functions of complex variable into real and imaginary parts. CO3:Explain convergence and divergence of an infinite series and find nth derivative of product of functions by Leibnitz's theorem. CO4:Find Taylor's and Maclaurian series expansion of differentiable functions and evaluate the limit of indeterminate forms using L'Hospital Rule CO5:Find Partial and Total derivative of functions of several variables. CO6:Apply the concept of Partial and Total derivative to find stationary values, error and approximate values of function. Also, examine functional dependency by Jacobian
Subject(Course Name) and Code: Engineering Maths – II 107008
CO1:Understand the concept of Differential equation and various methods of solution of first order first degree Differential equation. CO2:Modeling and evaluation of various physical systems : Newton's law of cooling, Electrical circuits, rectilinear motion, mass spring systems, heat transfer etc. CO3:To find Fourier series of continuous and discrete system CO4:To evaluate integrals using advanced techniques such as reduction formulae, Beta-Gamma function and Error function. CO5:Trace the approximate shape of curves and measure the arc length of various Curves. CO6:Find equation of sphere, cone and Cylinder. CO7:Find area, volume, mean and RMS values, mass, moment of inertia and centre of gravity using multiple integrals
Subject(Course Name) and Code: Engineering Physics, 107002
CO1:To explain the basic concept to resolve many engineering and technological problem. CO2:To use different methodologies to analyze problems in engineering. CO3:To use different techniques for measurement, calculation, control and analysis of engineering problems. CO4:To apply knowledge of physics for recent trends and advances in technological development. CO5:To explain physical properties of different materials over micro and nanoscale level. CO6:To apply basic knowledge of physics for developing mathematical and analytical abilities to solve engineering problems with high precision..
Subject(Course Name) and Code: Engineering Chemistry107009
CO1:Apply different methodologies for analysis of water, technique for softening water and suggest the importance of green chemistry in synthesis of various chemical compounds. CO2:Utilize different analytical methods for analysis of various chemical compounds.

CO3:Identify different types of polymer, their preparation methods, properties and applications in various fields.
CO4:Analyze fuel and suggest alternative fuel on the basis of their properties and applications.
CO5:Explain the importance of carbon and hydrogen compounds for applications in different fields.
CO6:Explain different causes for corrosion and suggest preventive methods.

Subject(Course Name) and Code: Basic Electrical Engineering 103004

CO1:Demonstrate and measurement of resistance with the variation of temperature, importance of insulation resistance, classification and evaluation of energy consumption through energy conversion.
CO2:Summarize the fundamentals of electromagnetism, compare electrical and magnetic circuit, and make use of magnetic circuit concepts to solve the numerical.
CO3:Apply the concepts of electromagnetic induction to analyze the principle of transformer and summarize the concepts of electrostatics.
CO4:Extend the concept of electromagnetic induction for generation of ac and its representation for practical analysis of ac circuits
CO5:Illustrate the concepts of single and three phase ac circuits along with the phasor diagrams.

CO6:Simplify the networks and provide the solution by applying Kirchhoff's laws and theorems

Subject(Course Name) and Code: Basic Civil & Environmental Engineering 101005

CO1- explain role of civil engineers in different areas of civil engineering with interdisciplinary approach.
CO2- illustrate different construction materials and components of a structure.
CO3- classify types of maps and modern surveying tools and techniques.
CO4- apply concept of environment and the role of civil engineers in sustainable development
CO5- utilize various principles of building planning and concept of green building
CO6- classify types of energy and environmental pollution

Subject(Course Name) and Code: Engineering Mechanics, 101011

CO1- Able to classify & analyze the force system.
CO2- Able to find the position of C.G. & centroid of various geometrical figures.
CO3- Able to analyze rectilinear & curvilinear motions with constant & variable acceleration & its applications.
CO4- Able to apply equilibrium equations for co-planar & non-coplanar forces.
CO5- Able to analyze various two force members & to apply coulombs law of friction to various engineering problems

Subject(Course Name) and Code: Engineering Graphics -1, 102006

CO1:To develop imagination of physical objects to be represented on paper for engineering communication.
CO2:To develop the manual drawing skill , drawing interpretation skill.
CO3:To develop the physical realisation of the dimensions of the objects.
CO4:To provide basic concepts to resolve many engineering and technological problems.
CO5:5. After completing this course students will be able to appreciate and use the methodologies to analyse wide range of engineering systems

Subject(Course Name) and Code: Engineering Graphics – II, 102014

CO1:To develop imagination of physical objects to be represented on paper for engineering communication.
CO2:To develop the manual drawing skill , drawing interpretation skill.
CO3:To develop the physical realisation of the dimensions of the objects.
CO4:To provide basic concepts to resolve many engineering and technological problems.
CO5:5. After completing this course students will be able to appreciate and use the methodologies to analyse wide range of engineering systems..

Subject(Course Name) and Code: Fundamentals of Programming Languges – I, 110003

CO1:To learn and acquire art of computer programming
CO2:To know about some popular programming languages and how to choose a programming language for solving problem using a computer
CO3:To learn basics of programming in C

Subject(Course Name) and Code: Fundamentals of Programming Languges – II, 110010

CO1:Design program involving structure and union.
CO2:Apply the concept of OOPs in data structure.
CO3:Built webpage using HTML.
CO4:Use modern engineering tool to develop Android app.
CO5: Develop skill to program for embedded system.

Subject(Course Name) and Code: Basic Mechanical Engineering, 102013

CO1:To acquire the knowledge of mechanical engineering
CO2: Describe the scope of mechanical engineering with multi disciplinary industries
CO3: Understand and identify the common machine elements with their functions and applications
CO4: Understand the concept of design and steps involved in design process
CO5: Impart the knowledge of different manufacturing processes.
CO6: Learn conventional machine tools and understand the concept of design in mechanical engineering.
CO7: Impart the knowledge of basic concept of thermodynamics applied to industrial applications.
CO8: Understand laying principles of energy conservation and conversion of energy
CO9: Understand the concept different power producing devices and power consuming devices

Department of Electrical Engineering

Semester: I & II(SECOND YEAR)

Subject(Course Name) and Code: Power Generation Technologies,203141

Course Outcomes

- .Be aware of the principle of operation, components, layout, location, environmental and social issues of nuclear, diesel and gas power plant.
- Identify and demonstrate the components of hydro power plant and calculation of turbine required based on catchment area.

- Find the importance of wind based energy generation along with its design, analysis and comparison.
- Apply solar energy in thermal and electrical power generation considering energy crisis, environmental and social benefits.
- Understand the operation of electrical energy generation using biomass, tidal, geothermal, hydel plants, fuel cell and interconnection with grid.

Subject(Course Name) and Code: 207006 Engineering Mathematics-III

- Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits.
- Solve problems related to Laplace transform, Fourier transform, Z-Transform and applications to Signal processing and Control systems
- Perform vector differentiation and integration, analyze the vector fields and apply to Electro-Magnetic fields.
- Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing

Subject(Course Name) and Code: 203142 Material Science

- Categorize and classify different materials from Electrical Engineering applications point of view.
- Explain and summarize various properties and characteristics of different classes of materials.
- Choose materials for application in various electrical equipment.
- Explain and describe knowledge of nanotechnology, batteries and solar cell materials.
- Test different classes of materials as per IS.

Subject(Course Name) and Code: 203143 Analog And Digital Electronics

- Understand conversion of number system, perform binary arithmetic and reduce Boolean expressions by K- Map.
- Demonstrate basics of various types of Flip flops, design registers and counter
- Analyze parameter of Op-amp and its applications.
- Apply the knowledge of Op-amp as wave form generators & filters
- Use BJT as amplifier with various configurations.
- Analysis of uncontrolled rectifier.

Subject(Course Name) and Code: 203144 Electrical Measurements and Instrumentation

- Understand various characteristics of measuring instruments, their classification and range extension technique.
- Classify resistance, apply measurement techniques for measurement of resistance, inductance.
- Explain construction, working principle and use of dynamometer type wattmeter for measurement of power under balance and unbalance condition.
- Explain Construction, working principle of 1-phase and 3-phase induction, static energy meter and calibration procedures
- Use of CRO for measurement of various electrical parameters,importance of transducers, their classification, selection criterion and various applications.Measurement of various physical parameters using transducers.

Subject(Course Name) and Code: 203151 Soft Skills

- Do SWOT analysis.
- Develop presentation and take part in group discussion.
- Understand andImplement etiquettes in workplace and in society at large.
- Work in team with team spirit.
- Utilize the techniques for time management and stress management

Subject(Course Name) and Code: 203154 Audit Course I

- Differentiate between types of solar Concentrators
- Apply software tool for solar concentrators
- Design different types of Solar collectors and balance of plant

Subject(Course Name) and Code: 203145 Power System I

- Recognize different patterns of load curve, calculate different factors associated with it and tariff structure for LT and HT consumers.
- Aware of features, ratings, application of different electrical equipment in power station and selection of overhead line insulators.
- Analyze and apply the knowledge of electrical and mechanical design of transmission lines.
- Identify and analyze the performance of transmission lines.

Subject(Course Name) and Code:203146 Electrical Machines I

- Apply energy conversion principles to different machines.
- Select machine for specific applications.
- Test the various machine for performance calculation.

Subject(Course Name) and Code:203147 Network Analysis

- Developing strong basics for network theory.
- Develop the problem solving technique for networks by application of theorems.
- Understand the behavior of the network by analyzing its transient response
- Apply their knowledge of network theory for designing special circuits like filters.

Subject(Course Name) and Code: 203148 Numerical Methods and Computer Programming

- Develop algorithms and implement programs using C language for various numerical methods.
- Demonstrate types of errors in computation and their causes of occurrence.
- Identify various types of equations and apply appropriate numerical method to solve different equations.
- Apply different numerical methods for interpolation, differentiation and numerical integration.
- Apply and compare various numerical methods to solve first and seApply and compare various numerical methods to solve linear simultaneous equations.

Subject(Course Name) and Code: 203149 Fundamentals of Microcontroller and Applications

- Differentiate between microprocessor and microcontroller.
- Describe the architecture and features of various types of microcontroller

- Demonstrate programming proficiency using the various addressing modes and all types of instructions of the target microcontroller.
- Program using the capabilities of the stack, the program counter the internal and external memory, timer and interrupts and show how these are used to execute a programme.
- Write assemble assembly language programs on PC and download and run their program on the training boards.
- Design electrical circuitry to the Microcontroller I/O ports in order to interface with external devices.
- Write assembly language programs and download the machine code that will provide solutions real-world control problems such as fluid level control, temperature control, and batch processes.

Department of Electrical Engineering

Semester: I & II(THIRD YEAR)

Subject(Course Name) and Code: 311121 Industrial and Technology Management

Course Outcomes

- Differentiate between different types of business organization and discuss the fundamentals of economics and management.
- Understand and implement the concepts of technology management and quality management
- Relate between marketing management and financial management.
- Employ the concepts of Human resource management, IPR and document Patent.
- Effectively communicate in Group discussions and work in team, develop leadership and entrepreneurship skills

Subject(Course Name) and Code: 303141 Advance Microcontroller and its Applications

- Able to design transformer.
- Able to design Induction motor.
- Able able to determine of parameters of transformer.
- Able to determine of parameters of Induction motor.

Subject(Course Name) and Code: 303150 Energy Audit and Management

- Analyze and understand energy consumption patterns and environmental impacts and mitigation
- Listing various energy conservation measures for various processes.
- Students carry out preliminary audit.

- PIC 18F458 Microcontroller internal Architecture and behavior of different PIC18F458 ports
- C language programming for PIC 18F458
- Understanding of hardware connection with PIC 18F458
- Architecture and Programming for Timer of PIC 18F458
- ADC, DAC and Sensor interfacing with PIC 18F458
- Serial port programming and Introduction to SPI protocol
- Interrupts programming

Subject(Course Name) and Code:303142 Electrical Machines-II

- Explain construction and working of synchronous machine
- Understand Speed control methods of induction motor
- State applications of various AC machines.

- Determine regulation and efficiency of AC machines experimentally.

Subject(Course Name) and Code: 303143 Power Electronics

- Understand the fundamental principles and applications of power electronics circuits.
- Solve problems and design switching regulators according to specifications.
- Use Computer-aided techniques for the design of power converter circuits.
- Appreciate the latest developments in power electronics.
- Communicate effectively, think critically and creatively
- Assimilate new technological and development in related field

Subject(Course Name) and Code: 303144 Electrical Installation, Maintenance and Testing

- Condition monitoring and Testing of various electrical equipment
- Distribution systems, its types and substations
- Design of different earthing systems
- Estimation and costing of residential and commercial buildings

Subject(Course Name) and Code: 303145 Seminar and Technical Communication

- Understand needs of today's world regarding innovations engineering
- Improve presentation and documentation skill.
- Apply theoretical knowledge to actual industrial applications and research activity

Help to contribute in analysis, planning, management and operation in Electrical engineering.

Subject(Course Name) and Code:303146 Power Systems II .

- Performance evaluation of power transmission lines
- Solve problems involving modeling, design and of HVDC
- modeling,design of EHVAC transmission lines
- Analyze power flow in power transmission networks and apply power flow results to solve simple planning problems.
- Calculate currents and voltages in a faulted power system under symmetrical faults, and relate fault currents to circuit breaker ratings
- calculate currents and voltage ratings under unsymmetrical faults in power system.

Subject(Course Name) and Code: 303148 Utilization of Electrical Energy .

- Students will be able to understand the importance of maximizing the energy efficiency by its optimum utilization and mould their practical work in professional world accordingly
- Students will be able to design simple resistance furnaces, illumination schemes
- Students will be able to the performance of arc furnace, electric traction
- Collection of technical information and delivery of collected information through presentations

Subject(Course Name) and Code: 303149 Design of Electrical Machines

- Can work out economic feasibility of encon option

Subject(Course Name) and Code: 303147 Control System I

- Analyze and understand compensation techniques
- listing various stability analysis
- Students able to design various controllers.
- Can work out economic feasibility time and frequency response

Semester: I & II(FINAL YEAR)
Subject(Course Name) and Code: 403141 Power System Operation and Control
Course Outcomes
• Identify and analyze the dynamics of power system and suggest means to improve stability of system • Suggest the appropriate method of reactive power generation and control • Analyze the generation-load balance in real time operation and its effect on frequency and develop • automatic control strategies with mathematical relations. • Formulate objective functions for optimization tasks such as unit commitment and economic load • dispatch and get solution using computational techniques
Subject(Course Name) and Code: 403142 PLC and SCADA Applications
• Develop and explain the working of PLC with the help of a block diagram. • Develop architecture of SCADA and explain the importance of SCADA in critical infrastructure • Execute, debug and test the programs developed for digital and analog operations • Reproduce block diagram representation on industrial applications using PLC and SCADA.
Subject(Course Name) and Code: 403143 Renewable Energy Systems
• Write theory of sources like solar, wind and also experiments of same. • Analyze operating conditions like stand alone and grid connected of renewable sources, • Reproduce different Storage Systems, concept of Integration and Economics of Renewable Energy System
Subject(Course Name) and Code: 403144 Restructuring and Deregulation
• Describe the process of restructuring of power system • Identify various operation of restructured power system • Analyze concept of congestion management. • Analyze various cost components in Generation, transmission, distribution sector and tariff • Analyze pricing and transmission rights of Electricity
Subject(Course Name) and Code: 403144 EHV AC Transmission
• Highlight need for EHV ac transmission. • Calculate line and ground parameters. • Enlist problems encountered in EHV transmission. • Express issues related to UHV transmission discussed.
Subject(Course Name) and Code: 403145 Control System - II
• Design and realize a compensator for a physical system, • Represent a physical system in state space format and analyze the same and to realize a controller using state space technique. • Analyze understand the various nonlinearities in a physical system. • Realize digital control schemes.
Subject(Course Name) and Code: 403146 Project
• Work in team and ensure satisfactory completion of project in all respect. • Handle different tools to complete the given task and to acquire specified knowledge in area of interest. • Provide solution to the current issues faced by the society. • Practice moral and ethical value while completing the given task.

- Communicate effectively findings in verbal and written forms.

Subject(Course Name) and Code: 403147 Switchgear and Protection

- Describe arc interruption methods in circuit breaker
- Derive expression for restriking voltage and RRRV in circuit breaker
- Explain Construction, and working of different high voltage circuit breakers such as ABCB, SF6 CB, and VCB.
- Classify and Describe different type of relays such as over current relay, Reverse power relay, directional over current relay, Differential relay, Distance relay, Static relay and numerical relay
- Describe various protection schemes used for transformer, alternator and busbar
- Describe transmission line protection schemes

Subject(Course Name) and Code: 403148 Power Electronic Controlled Drives

- Analyze the operation of the converter, chopper fed dc drive.
- Analyze the operation of both classical and modern induction motor drives.
- Design the current and speed controllers for a closed loop solid-state d.c motor drive
- Select the drives for any particular application

Subject(Course Name) and Code: 403149 High Voltage Engineering .

- Reproduce concepts in breadth with various concepts of breakdown phenomenon of solid, liquid and gaseous materials along with various causes of overvoltage and protection from them.
- List and reproduce various methods of generation and measurement of DC, AC and impulse high voltage.
- Demonstrate an ability to carry various DC. AC and impulse testing on high voltage equipments and materials
- Apply safety measures, earthing, shielding for layout of HV apparatus required in High voltage laboratory

Subject(Course Name) and Code: 403150 Smart Grid

- Differentiate Conventional and Smart Grid.
- Identify the need of Smart Grid, Micro Grid, Smart metering, Smart storage, Hybrid Vehicles, Home Automation, Smart Communication.
- Get introduced to new upcoming concepts in electrical from Utility to Consumers.
- Comparing and getting acquainted with emerging technologies and current professional issues in electric Grid.
- Express the necessity of global smart communication system

Department of Computer Engineering

Semester: I & II(second YEAR)

Subject(Course Name) and Code:210241 Discrete Mathematics

Course Outcomes

- To learn the concepts of set, relations, functions, Countability, Trees, Graphs
- To Classify the different computation, formula
- Can apply relations and use of functions correctly, solve the problems, and apply formal proof techniques
- Analyze best problems Solving techniques
- Students can Analyze and synthesize the real world problems using discrete mathematics
- Solve real world problems logically using appropriate set, function, relation models and interpret the associated operations and terminologies in context.

Subject(Course Name) and Code: 210242 Digital Electronics and Logic Design

- Realize and simplify Boolean Algebraic assignments for designing
- digital circuits using K-Maps
- Design and implement Sequential and Combinational digital circuits as per the specifications.
- Apply the knowledge to appropriate IC as per the design specifications.
- Develop simple embedded system for simple real world application.
- Design simple digital systems using VHDL

Subject(Course Name) and Code: 210243 Data Structures and Algorithms .

- To discriminate the usage of various structures in approaching the problem solution.
- To design the algorithms to solve the programming problems.
- To use effective and efficient data structures in solving various Computer Engineering domain problems
- To analyze the problems to apply suitable algorithm and data structure.
- To use appropriate algorithmic strategy for better efficiency

Subject(Course Name) and Code: 210244 Computer Organization and Architecture

- Students can Demonstrate computer architecture concepts related to design of modern processors, memories and I/Os.
- Analyze the principles of computer architect ure using examples drawn from commercially available computers.
- Evaluate various design alternatives in processor organization.
- To use appropriate algorithmic strategy for better efficiency

Subject(Course Name) and Code: 210245 Object Oriented Programming

- To differentiate between POP and OOP
- To identify and apply fundamental concepts of OOP
- Demonstrate polymorphic code, use inheritance to extend and override the functionality of classes.
- To evaluate and apply different design solutions for a problem using template and exception handing
- Design and implement solutions using OOP for small systems
- To understand the use of Standard Template Library(STL)

Subject(Course Name) and Code: 207003 Engineering Mathematics III

- Solve higher order linear differential equation using appropriate techniques for modeling and
- analyzing electrical circuits."
- Solve problems related to Fourier transform, Z-Transform aapplications to Signal and
- Image processing."
- Apply statistical methods like correlation, regression analysis and probability theory for
- analysis and prediction of a given data as applied to machine intelligence."
- Perform vector differentiation and integration to analyze the vector fields and apply to
- compute line, surface and volume integral

- Analyze conformal mappings, transformations and perform contour integration of complex
- functions required in Image processing, Digital filters and Computer graphics

Subject(Course Name) and Code: 210251 Computer Graphics

- To understand structure & operation of various hardware devices and to recognize file formats & graphics libraries used in computer graphics
- To understand and analyze different scan conversion
- To implement polygon filling, windowing and clipping algorithms and compare their performance
- To interpret, use 2D and 3D geometric transformations.
- To apply techniques of hidden surfaces, light effects, shading, curve generation and fractals in construction of natural objects.
- To experiment advanced animations and gaming techniques to create animation by using modern graphics tools. .

Subject(Course Name) and Code: 210252 Advanced Data Structures

- To apply appropriate advanced data structure and efficient algorithms to approach the problems of various domain
- To design the algorithms to solve the programming problems
- To use effective and efficient data structures in solving various Computer Engineering domain problems
- To analyze the algorithmic solutions for resource requirements and optimization
- To use appropriate modern tools to understand and analyze the functionalities confined to the data structure usage

Subject(Course Name) and Code: 210253 Microprocessor

- To apply the assembly language programming to develop small real life embedded application
- To understand the architecture of the advanced processor thoroughly to use the resources for programming
- To understand the higher processor architectures descended from 80386 architecture

Subject(Course Name) and Code: 210254 Principles of Programming Languages

- To learn the software development process and concept of syntax and semantics of language. "
- To classify the different data types and construct the structure of computation.
- To infer different programming paradigms
- Able to write program with use of class ,object
- To Design applications using the concept of exception handling and apple

Department of Computer Engineering

Semester: I & II(THIRD YEAR)

Subject(Course Name) and Code: 310241 Theory of Computation (TOC)

Course Outcomes

- Able to design deterministic Turing machine for all inputs all outputs
- Able to subdivide problem space based on input subdivision using
- Able to apply linguistic theory

Subject(Course Name) and Code: 310242 Database Management Systems (DBMS) I

- Identify structure of database system using data models and demonstrate SQL
- Compare structured and unstructured databases and demonstrateNoSQL
- Define and discuss transaction management,query optimization and performance tuning of SQL and NoSQL
- Describe various database architectures and demonstrate client server model
- Describe various database architectures and demonstrate client server model
- Discuss data warehouse and data mining techniques

Subject(Course Name) and Code: 310243 Software Engineering & Project Management (SE & PM)

- Decide on a process model for a developing a software project
- Classify software applications and Identify unique features of various domains
- Design test cases of a software system.
- Understand basics of IT Project management.
- Plan, schedule and execute a project considering the risk management.
- Apply quality attributes in software development life cycle.

Subject(Course Name) and Code: 310244 Information Systems & Engineering Economics (IS & EE)

- Understand the need, usage and importance of an Information System to an organization.
- Understand the activities that are undertaken while managing, designing,
- planning, implementation, and deployment of computerized information system in an organization.
- Outline the past history, present position and expected performance of
- a company engaged in engineering practice or in the computer industry.
- Perform and evaluate present worth, future worth and annual worth analyses on one of more economic alternatives

Subject(Course Name) and Code: 310245 Computer Networks (CN)

- Analyze the requirements for given organizationalstructure to select the most appropriate networking architectures, topologies, transmission mediums and technologies.
- Demonstrate design issues, flow control and error control.
- Analyze data flow between TCP/IP model using application, transport and network layer protocols
- Illustrate applications of computer network capabilites, selection and usage for various sectors of user community
- Illustrate client server architecture and prototypes by means of correct standard and technology.
- Demonstrate different routing and switching algorithms.

Subject(Course Name) and Code: 310249 "Principles of Concurrent and Distributed Programming"

- Able to describe and choose suitable distributed programming environment for particular computational model.
- Able to use concurrent programming
- Able to describe and use the knowledge of CUDA and parallel computing.
- Able to explain and choose suitable distributed computing environment
- Able to perform virtualization for Xen System

● Able to use concurrent and parallel programming using GPU
Subject(Course Name) and Code:310250 "Embedded Operating Systems"
● Describe and analyze concepts of real time operating system and its tasks. ● Develop an application using Beagle bone-Black and ARM ● Use of Linux kernel, build utilities in embedded operating system and analyze embedded system initialization with cross development environment. ● Explain boot loader, embedded development environment and demonstrate device driver and file system commands. ● Use of development & debugging tools in embedded linux to develop applications by interfacing with embedded system. ● Illustrate embedded android system and test various embedded android application
Subject(Course Name) and Code:310251 Computer Networks
● Analyze the requirements for given organizationalstructure to select the most appropriate networking architectures, topologies, transmission mediums and technologies. ● Demonstrate design issues, flow control and error control. ● Analyze data flow between TCP/IP model using application, transport and network layer protocols ● Illustrate applications of computer network capabilites, selection and usage for various sectors of user community ● Illustrate client server architecture and prototypes by means of correct standard and technology. ● Demonstrate different routing and switching algorithms.
Subject(Course Name) and Code: 310252 Software Engineering
● Decide on a process model for a developing a software project ● Classify software applications and Identify unique features of various domains ● Design test cases of a software system. ● Understand basics of IT Project management. ● Plan, schedule and execute a project considering the risk management. ● Apply quality attributes in software development life cycle. ● lustrate client server architecture and prototypes by means of correct standard and technology. ● Demonstrate different routing and switching algorithms.
Subject(Course Name) and Code: 3310253 "Digital Signal Processing
● Development of ability for generating proper solution to signal processing problems. ● To apply the assembly language programming to develop small real life embedded application. ● To understand the architecture of the advanced processor thoroughly to use the resources for programmin
Department of Computer Engineering
Semester: I & II(FINAL YEAR)
Subject(Course Name) and Code: 310241 Theory of Computation (TOC)

Course Outcomes
Subject(Course Name) and Code:410441 Design and Analysis of Algorithms
• To solve problem in the UG projects • To develop SRS in the UG projects • To solve problems for multi-core or distributed or concurrent/Parallel/Embedded environments
Subject(Course Name) and Code:410442 Principles of Modern Compiler Design
• To write concepts in assembling, parsing and compiling the target code for execution. • To survey the systems and methods of compilation. • To practice basic FOSS tools for compiler writing and expose the latest techniques and advances in compiler. • .To verify and use concurrent, embedded and distributed compilation tools and techniques
Subject(Course Name) and Code:410443 Smart System Design and Applications
• To write and survey solution for multidisciplinary case-study using mathematical modeling give presentations using soft skills methodologies • To write and survey embedded systems applications using machine learning; • To solve problems for multi-core or distributed, concurrent and embedded environments
Subject(Course Name) and Code:410444D Data Mining Techniques and Applications
• To develop programs and methods for data Mining applications. • To solve problems for multi-core or distributed, concurrent/Parallel environments • To present survey on different learning, classication and data mining foundations
Subject(Course Name) and Code:410445B Pervasive Computing
• To present a survey on pervasive computing building blocks. • To create presentations using pervasive computing techniques and devices. • To solve problems for multi-core or distributed, concurrent/Parallel environment
Subject(Course Name) and Code:410449 Software Design Methodologies and Testing
• To present a survey on design techniques for software system • To present a design and model using UML for a given software system • To present a design of test cases and implement automated testing for client server, Distributed, mobile applications
Subject(Course Name) and Code:410450 High Performance Computing
• To present a survey on pervasive computing building blocks. • To create presentations using pervasive computing techniques and devices. • To solve problems for multi-core or distributed, concurrent/Parallel environment
Subject(Course Name) and Code:410451D Cyber Security
• To present a survey on design techniques for software system • To present a design and model using UML for a given software system • To present a design of test cases and implement automated testing for client server, Distributed, mobile applications
Subject(Course Name) and Code:410452 Business Analytic and Intelligence

- To solve problem in projects
- To develop SRS in the projects
- To solve problems for multi-core or distributed, concurrent/Parallel environments

Department of Electronics & telecommunication Engineering

Semester: I & II(SECOND YEAR)

Subject(Course Name) and Code: 204181 Signals & Systems

Course Outcomes

- Understand mathematical description and representation of continuous and discrete time signals and systems.
- Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system.
- Understand and resolve the signals in frequency domain using Fourier series and Fourier transforms.
- Understand the limitations of Fourier transform and need for Laplace transform and develop the ability to analyze the system in s- domain.
- Understand the basic concept of probability, random variables & random signals and develop the ability to find correlation, CDF, PDF and probability of a given event.

Subject(Course Name) and Code:204182 Electronic Devices & Circuits

- Comply and verify parameters after exciting devices by any stated method.
- Implement circuit and test the performance.
- Analyze small signal model of FET and MOSFET.
- Explain behavior of FET at low frequency.
- Design an adjustable voltage regulator circuits.

Subject(Course Name) and Code:204183 Electrical Circuits and Machines

- Analyze basic AC & DC circuit for voltage, current and power by using KVL, KCL, andnetwork theorems.
- Explain the working principle of different electrical machines.
- Select proper electrical motor for given application.
- Design and analyze transformers.

Subject(Course Name) and Code:204184Data Structures and Algorithms

- Discuss the computational efficiency of the principal algorithms such as sorting & searching.
- Write and understand the programs that use arrays & pointers in C
- Describe how arrays, records, linked structures are represented in memory and use them in algorithms.
- Implement stacks & queues for various applications.
- Understand various terminologies and traversals of trees and use them for various applications.
- Understand various terminologies and traversals of graphs and use them for various applications.

Subject(Course Name) and Code:204185 Digital Electronics

- Use the basic logic gates and various reduction techniques of digital logic circuit in detail.
- Design combinational and sequential circuits.
- Design and implement hardware circuit to test performance and application.
- Understand the architecture and use of microcontrollers for basic operations and Simulate using simulation software.

Subject(Course Name) and Code:204186 Electronic Measuring Instruments and Tools

- Understand fundamental of various electrical measurements.
- Understand and describe specifications, features and capabilities of electronic instruments.
- Finalize the specifications of instrument and select an appropriate instrument for given measurement.
- Carry out required measurement using various instruments under different setups.
- Able to compare measuring instruments for performance parameters
- Select appropriate instrument for the measurement of electrical parameter professionally.

SEM II

Subject(Course Name) and Code:207005 Engineering Mathematics -III

- Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits.
- Solve problems related to Fourier transform, Z-transform and applications to Communication systems and Signal processing.
- Obtain Interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing.
- Perform vector differentiation and integration, analyze the vector fields and apply to Electro-Magnetic fields.
- Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing

Subject(Course Name) and Code:204187 Integrated Circuits

- Understand the characteristics of IC and Op-Amp and identify the internal structure. Understand and identify various manufacturing techniques.
- Derive and determine various performances based parameters and their significance for Op-Amp.
- Comply and verify parameters after exciting IC by any stated method.
- Analyze and identify the closed loop stability considerations and I/O limitations.
- Analyze and identify linear and nonlinear applications of Op-Amp.
- Understand and verify results (levels of V & I) with hardware implementation.
- Implement hardwired circuit to test performance and application for what it is being designed.
- Understand and apply the functionalities of PLL to Frequency synthesizer, multiplier, FM, and AM demodulator

Subject(Course Name) and Code:204188 Control Systems

- Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems.
- Determine the (absolute) stability of a closed-loop control system.
- Perform time domain and frequency domain analysis of control systems required for stability analysis.
- Perform time domain and frequency domain correlation analysis.
- Apply root-locus, Frequency Plots technique to analyze control systems. Express and solve system equations in state variable form.

Subject(Course Name) and Code:204189 Analog Communications

- Understand and identify the fundamental concepts and various components of analogcommunication systems.
- Explain signal to noise ratio, noise figure and noise temperature for single and cascaded stages in a communication system.

● Describe analog pulse modulation techniques and digital modulation technique. ● Develop the ability to compare and contrast the strengths and weaknesses of variouscommunication systems.
Subject(Course Name) and Code:204190 Object Oriented Programming
● Describe the principles of object oriented programming. ● Apply the concepts of data encapsulation, inheritance in C++. ● Understand basic program constructs in Java ● Apply the concepts of classes, methods and inheritance to write programs Java. ● Use arrays, vectors and strings concepts and interfaces to write programs in Java. ● Describe and use the concepts in Java to develop user friendly program,
Subject(Course Name) and Code:204191 EMPLOYABILITY SKILL DEVELOPMENT
● Have skills and preparedness for aptitude tests. ● Be equipped with essential communication skills (writing, verbal and non-verbal) Master the presentation skill and be ready for facing interviews. ● Build team and lead it for problem solving.
Semester: I & II(THIRD YEAR)
Subject(Course Name) and Code:304181 Digital Communication
● Understand working of waveform coding techniques and analyse their performance. ● Analyze the performance of a baseband and pass band digital communication system in terms of error rate and spectral efficiency. ● Perform the time and frequency domain analysis of the signals in a digital communication system. Design of digital communication system. ● Understand working of spread spectrum communication system and analyze its performance.
Subject(Course Name) and Code:304182Digital Signal Processing
● Analyze the discrete time signals and system using different transform domain techniques. ● Design and implement LTI filters for filtering different real world signals. ● Develop different signal processing applications using DSP processor
Subject(Course Name) and Code:304183Electromagnetics
● Understand the basic mathematical concepts related to electromagnetic vector fields. ● Apply the principles of electrostatics to the solutions of problems relating to electric field and electric potential, boundary conditions and electric energy density. ● Apply the principles of magnetostatics to the solutions of problems relating to magnetic field and magnetic potential, boundary conditions and magnetic energy density. ● Understand the concepts related to Faraday‘s law, induced emf and Maxwell‘s equations. ● Apply Maxwell‘s equations to solutions of problems relating to transmission lines and uniform plane wave propagation.
Subject(Course Name) and Code:304184 Microcontrollers
● Learn importance of microcontroller in designing embedded application. ● Learn use of hardware and software tools. ● Develop interfacing to real world devices
Subject(Course Name) and Code:304185 Mechatronics
● Identification of key elements of mechatronics system and its representation in terms of block diagram ● Understanding basic principal of Sensors and Transducer. ● Able to prepare case study of the system given.

Subject(Course Name) and Code:304193 Electronic System Design
• Apply the fundamental concepts and working principles of electronics devices to design electronics systems. • Shall be able to interpret datasheets and thus select appropriate components and devices Select appropriate transducer and signal conditioning circuit to design prototype of Data Acquisition system. • Design an electronic system/sub-system and validate its performance by simulating the same. Shall be able to use an EDA tool for circuit schematic and simulation. • Create, manage the database and query handling using suitable tools.
Subject(Course Name) and Code: 304186 Power Electronics
• Design & implement a triggering / gate drive circuit for a power device • Understand, perform & analyze different controlled converters. • Evaluate battery backup time & design a battery charger. • Design & implement over voltage / over current protection circuit.
Subject(Course Name) and Code:304187 Information Theory ,Coding Techniques and Communication Networks
• Perform information theoretic analysis of communication system. • Design a data compression scheme using suitable source coding technique. • Design a channel coding scheme for a communication system. • Understand and apply fundamental principles of data communication and networking • Apply flow and error control techniques in communication networks.
Subject(Course Name) and Code:304188 Business Management
• Get overview of Management Science aspects useful in business. • Get motivation for Entrepreneurship • Get Quality Aspects for Systematically Running the Business • To Develop Project Management aspect and Entrepreneurship Skills.
Subject(Course Name) and Code:304189 Advanced Processors
• Describe the ARM microprocessor architectures and its feature. • Interface the advanced peripherals to ARM based microcontroller • Design embedded system with available resources. • Use of DSP Processors andresources for signal processing applications.
Subject(Course Name) and Code:304190 System Programming and Operating System
• Demonstrate the knowledge of Systems Programming and Operating Systems Formulate the Problem and develop the solution for same. • Compare and analyse the different implementation approach of system programming operating system abstractions. • Interpret various OS functions used in Linux / Ubuntu
Subject(Course Name) and Code:304196 Employability Skills and Mini Project
• Understand, plan and execute a Mini Project with team. • Implement electronic hardware by learning PCB artwork design, soldering techniques, testing and troubleshooting etc. • Prepare a technical report based on the Mini project. • Deliver technical seminar based on the Mini Project work carried out.
Semester: I & II(FINAL YEAR)
Subject(Course Name) and Code:404181 VLSI Design & Technology
• Model digital circuit with HDL, simulate, synthesis and prototype in PLDs. • Understand chip level issues and need of testability.

- Design analog & digital CMOS circuits for specified applications.

Subject(Course Name) and Code:404182Computer Networks

- Formulate the wave equation in wave guide for analysis.
- Identify the use of microwave components and devices in microwave applications. Understand the working principles of all the microwave tubes Understand the working principles of all the solid state devices
- Choose a suitable microwave tube and solid state device for a particular application
- Carry out the microwave network analysis
- Choose a suitable microwave measurement instruments and carry out the required measurements

Subject(Course Name) and Code:404183Microwave Engineering

- Understand fundamental underlying principles of computer networking
- Describe and analyze the hardware, software, components of a network and the interrelations.
- Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies;
- Have a basic knowledge of the use of cryptography and network security;
- Have a basic knowledge of installing and configuring networking applications.
- Specify and identify deficiencies in existing protocols, and then go onto select new and better protocols.

Subject(Course Name) and Code:404184Digital Image Processing

- Develop and implement algorithms for digital image processing.
- Apply image processing algorithms for practical object recognition applications.

Subject(Course Name) and Code:404184 Embedded Systems & RTOS

- Get insight of design metri cs of Embedded systems to design real time applications to match recent trends in technology.
- Understand Real time systems concepts.
- Understand Linux operating system and device drivers.
- Get to know the hardware software co design issues and testing ethodology for
- Embedded system.

Subject(Course Name) and Code:404184Software Defined Radio(

- Compare SDR with traditional Hardware Radio HDR
- Implement modern wireless system based on OFDM, MIMO & Smart Antenna
- Build experiment with real wireless waveform and applications, accessing both PHY and MAC, Compare SDR versus MATLAB and Hardware Radio
- Work on open projects and explore their capability to build their own communication
- system.

Subject(Course Name) and Code:404184 Industrial Drives and Control

Understand the basic principles of power electronics in drives and its control, types of drives and basic requirements placed by mechanical systems on electric drives.

- Understand the operation of 1ϕ & 3ϕ converter drives for separately excited & series DC motors, dual converter drives, 2 quadrant and 4 quadrant DC chopper drives, Open loop& closed loop control of DC drives with transfer function, Dynamic and regenerative braking. Protection circuits for DC drives.
- Learn speed control of induction motor drives in an energy efficient manner using power electronics.

- To study and understand the operation of both classical and modern induction motor drives.

- Learn and understand working of cylindrical rotor motor, salient pole motor, reluctance motor, and permanen magnet motors.
- Learn closed loop V/f control and load commutated inverter (LCI) control. Variable
- reluctance & permanent magnet stepper motors & drives, switched reluctance motors & drives, brushless DC and AC motors & drives

.

Subject(Course Name) and Code:404185Multi-rate and Adaptive Signal Processing
• The student will use theory of multirate processing for design of basic systems. • The student will be able to performmultiresolutionanalysis using Haar wavelet. • The student will show skills for design of adaptive filter for Wiener filter.
Subject(Course Name) and Code:404185Electronic Product Design
• Understand various stages of hardware, software and PCB design. • Importance of product test & test specifications. • Special design considerations and importance of documentation.
Subject(Course Name) and Code:404185PLC&Automatio
• Understand PLC architecture, PLC addressing concepts. • Develop PLC ladder programs for simple industrial applications. • Design Automation systems for industrial applications
Subject(Course Name) and Code:404185Artificial Intelligence
• Design and implement key components of intelligent agents and expert systems. • To apply knowledge representation techniques and problem solving strategies to common AI applications. • Apply and integrate various artificial intelligence techniques in intelligent system development as well as understand the importance of maintaining intelligent systems. • Build rule-based and other knowledge-intensive problem solvers.
Subject(Course Name) and Code:404189Mobile Communication
• Explain and apply the concepts telecommunication switching, traffic and networks • Analyze the telecommunication traffic. • Analyze radio channel and cellular capacity. • Explain and apply concepts of GSM and CDMA system.
Subject(Course Name) and Code:404190Broadband Communication System
• Carry out Link power budget and Rise Time Budget by proper selection of components and check its viability. • Carry out Satellite Link design for Up Link and Down Link.
Subject(Course Name) and Code:404191Speech and Audio Signal Processing
• Design and implement algorithms for processing speech and audio signals considering the properties of acoustic signals and human hearing. • Analyze speech signal to extract the characteristic of vocal tract (formants) and vocal cords (pitch). • Write a program for extracting LPC Parameters using Levinson • Durbin algorithm Formulate and design a system for speech recognition and speaker recognition
Subject(Course Name) and Code:404191RF Circuit Design

- Understand behavior of passive components at high frequency and modeling of HF circuit. Design HF amplifiers with gain bandwidth parameters.
- Understand Mixer types and characteristics.
- Gain the knowledge about PLLs and Oscillators with respect to their circuit topologies

Subject(Course Name) and Code404191Audio Video Engineering

- To study the analysis and synthesis of TV Pictures, Composite Video Signal, Receiver, Picture Tubes and Television Camera Tubes.
- To study the various Colour Television systems with a greater emphasis on television standards.
- To study the advanced topics in Digital Television and High Definition Television.
- To study audio recording systems such CD/DVD recording, Audio Standards, and Acoustics principles.

Subject(Course Name) and Code:404191SOFT COMPUTING TECHNIQUES

- use a new tool /tools to solve a wide variety of real world problems find an alternate solution , which may offer more adaptability, resilience and optimization
- Identify the suitable antenna for a given communication system
- Gain knowledge of soft computing domain which opens up a whole new career option
- Tackle real world research problems

Subject(Course Name) and Code:404192Biomedical Signal Processing

- The student will be able to model a biomedical system.
- The student will be able to understand various methods of acquiring bio signals.
- The student will be able to understand various sources of bio signal distortions and its remedial techniques.
- The students will be able to analyze ECG and EEG signal with characteristic feature points. The student will have a basic understanding of diagnosing bio-signals and classifying

Subject(Course Name) and Code:404192Nano Electronics and MEMS

- Gain knowledge of Nano electronics material, and manufacturing of Nano devices.
- Be introduced to MEMS and its sensors and actuators.
- Understand various measuring methods and tools.

Subject(Course Name) and Code:404192Detection and Estimation Theory

- Apply suitable hypothesis testing criteria for signal detection problems.
- Use parameter estimation in signal processing and communication problems.
- Design a estimator and detector.

Subject(Course Name) and Code:404192Wireless Networks

- Keep himself updated on latest wireless technologies and trends in the communication field Understand the transmission of voice and data through various networks.

Department of Mechanical Engineering

Semester: I & II(second YEAR)

Subject(Course Name) and Code: 207002 Engineering Mathematics III (Mechanical + SW / Production + SW / Industrial /Automobile Engineering)

Course Outcomes

- Solve higher order linear differential equations and apply to modeling and analyzing mass spring systems.
- Apply Laplace transform and Fourier transform techniques to solve differential equations involved in Vibration theory, Heat transfer and related engineering applications.
- Apply statistical methods like correlation, regression analysis in analyzing, interpreting experimental data and probability theory in testing and quality control.

- Perform vector differentiation and integration, analyze the vector fields and apply to fluid flow problems.
- Solve various partial differential equations such as wave equation, one and two dimensional heat flow equations.

Subject(Course Name) and Code:202041: Manufacturing Process- I

- Understand and analyze foundry practices like pattern making, mold making, Core making and Inspection of defects.
- Understand and analyze Hot and Cold Working, Rolling, Forging, Extrusion and Drawing Processes.
- Understand different plastic molding processes, Extrusion of Plastic and Thermoforming
- Understand different Welding and joining processes and its defects
- Understand, Design and Analyze different sheet metal working processes
- Understand the constructional details and Working of Centre Lathe

Subject(Course Name) and Code:202042: Computer Aided Machine Drawing

- Understand the importance of CAD in the light of allied technologies such as CAM, CAE, FEA, CFD, PLM.
- Understand the significance of parametric technology and its application in 2D sketching.
- Understand the significance of parametric feature-based modeling and its application in 3D machine components modeling.
- Ability to create 3D assemblies that represent static or dynamic Mechanical Systems.
- Ability to ensure manufacturability and proper assembly of components and assemblies.
- Ability to communicate between Design and Manufacturing using 2D drawings.

Subject(Course Name) and Code:2043: Thermodynamics:

- On completion of the course, learner will be able to–
- Apply various laws of thermodynamics to various processes and real systems.
- Apply the concept of Entropy, Calculate heat, work and other important thermodynamic properties for various ideal gas processes.
- Estimate performance of various Thermodynamic gas power cycles and gas refrigeration cycle and availability in each case.
- Estimate the condition of steam and performance of vapour power cycle and vapour compression cycle.
- Estimate Stoichiometric air required for combustion, performance of steam generators and natural draught requirements in boiler plants.
- Use Psychromertic charts and estimate various essential properties related to Psychrometry and processes

Subject(Course Name) and Code:202044: Material Science

- Understand the basic concepts and properties of Material.
- Understand about material fundamental and processing.
- Select proper metal, alloys, nonmetal and powder metallurgical component for specific requirement
- Detect the defects in crystal and its effect on crystal properties.
- Evaluate the different properties of material by studying different test
- Recognize how metals can be strengthened by cold-working and hot working

Subject(Course Name) and Code:202051: Strength of Materials

- Apply knowledge of mathematics, science for engineering applications
- Design and conduct experiments, as well as to analyze and interpret data
- Design a component to meet desired needs within realistic constraints of health and safety

- Identify, formulate, and solve engineering problems
- Practice professional and ethical responsibility
- Use the techniques, skills, and modern engineering tools necessary for engineering practice

Subject(Course Name) and Code:202054: Value Education

- Understood human values, their significance and role in life.
- Promote self-reflection and critical inquiry that foster critical thinking of one's value and the values of others.
- Practice respect for human rights and democratic principles.
- Familiarized with various living and non-living organisms and their interaction with environment.
- Understood the basics regarding the leadership and to become a conscious professional.

Subject(Course Name) and Code:202054 A: Innovations in Engineering Field/ Agriculture

- Understand what is thinking, its tools and process and its application to innovation
- Practice application of innovation in engineering
- Understand important terms like national productivity, sustainable development and inclusive growth
- Throw a light on developing technologies in agriculture
- Learn Interdisciplinary Engineering applications in Agriculture

Subject(Course Name) and Code:202045: Fluid Mechanics

- Use of various properties in solving the problems in fluids
- Use of Bernoulli's equation for solutions in fluids
- Determination of forces drag and lift on immersed bodies

Subject(Course Name) and Code:202047: Soft Skills

- Improved communication, interaction and presentation of ideas.
- Right attitudinal and behaviouralchange
- Developed right-attitudinal and behavioral change

Subject(Course Name) and Code:202048: Theory of Machines – I

- Identify mechanisms in real life applications.
- Perform kinematic analysis of simple mechanisms.
- Perform static and dynamic force analysis of slider crank mechanism.
- Determine moment of inertia of rigid bodies experimentally.
- Analyze velocity and acceleration of mechanisms by vector and graphical methods.

Subject(Course Name) and Code:202048: Engineering Metallurgy

- describe how metals and alloys formed and how the properties change due to microstructure
• apply core concepts in Engineering Metallurgy to solve engineering problems.
- conduct experiments, as well as to analyze and interpret data
- select materials for design and construction.
- possess the skills and techniques necessary for modern materials engineering practice
- recognize how metals can be strengthened by alloying, cold-working, and heat treatment

Subject(Course Name) and Code:202050: Applied Thermodynamics

- Classify various types of Engines, Compare Air standard, Fuel Air and Actual cycles and make out various losses in real cycles.
- Understand Theory of Carburetion, Modern Carburetor, Stages of Combustion in S. I. Engines and Theory of Detonation, Pre-ignition and factors affecting detonation.

- Understand Fuel Supply system, Types of Injectors and Injection Pumps, Stages of Combustion in CI Engines, Theory of Detonation in CI Engines and Comparison of SI and CI Combustion and Knocking and Factors affecting, Criteria for good combustion chamber and types.
- Carry out Testing of I. C. Engines and analyze its performance.
- Describe construction and working of various I. C. Engine systems (Cooling, Lubrication, Ignition, Governing, and Starting) also various harmful gases emitted from exhaust and different devices to control pollution and emission norms for pollution control.
- Describe construction, working of various types of reciprocating and rotary compressors with performance calculations of positive displacement compressors.

Subject(Course Name) and Code:203152: Electrical and Electronics Engineering

- Develop the capability to identify and select suitable DC motor / induction motor / special purpose motor and its speed control method for given industrial application.
- Program Arduino IDE using conditional statements
- Interfacing sensors with Arduino IDE

Semester: I & II(THIRD YEAR)

Subject(Course Name) and Code:: 302041 Design of Machine Elements – I

- Ability to identify and understand failure modes for mechanical elements and design of machine elements based on strength.
- Ability to design Shafts, Keys and Coupling for industrial applications.
- Ability to design machine elements subjected to fluctuating loads.
- Ability to design Power Screws for various applications.
- Ability to design fasteners and welded joints subjected to different loading conditions.
- Ability to design various Springs for strength and stiffness.

Subject(Course Name) and Code:302042 HEAT TRANSFER

- Analyze the various modes of heat transfer and implement the basic heat conduction equations for steady one dimensional thermal system.
- Implement the general heat conduction equation to thermal systems with and without internal heat generation and transient heat conduction.
- Analyze the heat transfer rate in natural and forced convection and evaluate through experimentation investigation. Interpret heat transfer by radiation between objects with simple geometr
- Analyze the heat transfer equipment and investigate the performance.

Subject(Course Name) and Code:302043Theory of Machine – II

- Student will be able to understand fundamentals of gear theory which will be the prerequisite for gear design.
- Student will be able to perform force analysis of Spur, Helical, Bevel, Worm and Worm gear. The student to analyze speed and torque in epi-cyclic gear trains which will be the prerequisite for gear box design.
- Student will be able to design cam profile for given follower motions and understand cam Jump phenomenon, advance cam curves.
- The student will synthesize a four bar mechanism with analytical and graphical methods.
- a. The student will analyze the gyroscopic couple or effect for stabilization of Ship Aeroplane and Four wheeler vehicle. b. Student will choose appropriate drive for given application (stepped / step-less)

Subject(Course Name) and Code:302044 Turbo Machines

- Apply thermodynamics and kinematics principles to turbo machines.

- Analyze the performance of turbo machines
- .Ability to select turbo machine for given application.
- Predict performance of turbo machine using model analysis.

Subject(Course Name) and Code: 302045 Metrology And Quality Control

- Understand the methods of measurement, selection of measuring instruments / standards of measurement, carryout data collection and its analysis.
- Explain tolerance, limits of size, fits, geometric and position tolerances and gauge design
- Understand and use/apply Quality Control Techniques/ Statistical Tools appropriately.
- Develop an ability of problem solving and decision making by identifying and analyzing the cause for variation and recommend suitable corrective actions for quality improvement

Subject(Course Name) and Code: 302047 Numerical Methods and Optimization

- Use appropriate Numerical Methods to solve complex mechanical engineering problems.
- Formulate algorithms and programming.
- Use Mathematical Solver.
- Generate Solutions for real life problem using optimization techniques.
- Analyze the research problem

Subject(Course Name) and Code:302048 Design of Machine Elements – II

- To understand and apply principles of gear design to spur gears and industrial spur gear boxes.
- To become proficient in Design of Helical and Bevel Gear
- To develop capability to analyse Rolling contact bearing and its selection from manufacturer's Catalogue.
- To learn a skill to design worm gear box for various industrial applications.
- To inculcate an ability to design belt drives and selection of belt, rope and chain drives.
- To achieve an expertise in design of Sliding contact bearing in industrial applications.

Subject(Course Name) and Code: 302049 Refrigeration and Air Conditioning

- Illustrate the fundamental principles and applications of refrigeration and air conditioning system -
- Obtain cooling capacity and coefficient of performance by conducting test on vapour compression refrigeration systems -
- Present the properties, applications and environmental issues of different refrigerants - Calculate cooling load for air conditioning systems used for various - Operate and analyze the refrigeration and air conditioning systems.

Subject(Course Name) and Code:302050 Mechatronics

- Identification of key elements of mechatronics system and its representation in terms of block diagram
- Understanding the concept of signal processing and use of interfacing systems such as ADC, DAC, digital I/O
- Interfacing of Sensors, Actuators using appropriate DAQ micro-controller
- Time and Frequency domain analysis of system model (for control application)
- PID control implementation on real time systems
- Development of PLC ladder programming and implementation of real life system.

Subject(Course Name) and Code:302051 MANUFATCURING PROCESS – II

- Student should be able to apply the knowledge of various manufacturing processes
- Student should be able to identify various process parameters and their effect on processes. Student should be able to figure out application of modern machining.
- Students should get the knowledge of Jigs and Fixtures for variety of operations.

Semester: I & II(FINAL YEAR)
Subject(Course Name) and Code:402041 Refrigeration and Air Conditioning
● Illustrate the fundamental principles and applications of refrigeration and air conditioning system ● Obtain cooling capacity and coefficient of performance by conducting test on vapor compression refrigeration systems - ● Present the properties, applications and environmental issues of different refrigerants - Calculate cooling load for air conditioning systems used for various applications - ● Operate and analyze the refrigeration and air conditioning systems.
Subject(Course Name) and Code:402042CAD/CAM and Automation
● Analyze and design real world components - ● Suggest whether the given solid is safe for the load applied. - ● Select suitable manufacturing method for complex components
Subject(Course Name) and Code:402043 Dynamics of Machinery
● Solutions to balancing problems of machines. ● Ability to understand the fundamentals of vibration and Noise. ● Ability to develop analytical competency in solving vibration problems. ● Ability to understand measurement and control of vibration and noise. ● Ability to calculate natural frequencies, Eigen values & Eigen vectors. ● Ability to measure vibrations, vibration characteristics and understand various methods for vibration control for real life problem.
Subject(Course Name) and Code:402044A Energy Audit and Management (Elective I)
● Carry out Energy Audit of there residence / society / college where they are studying. - ● Carry out electrical tariff calculation and accurately predict the electricity bill required for the installation. - ● Suggest various methods to reduce energy consumption of the equipment / office / premises.
Subject(Course Name) and Code:402044BTribology (Elective I)
● For these simplified course contents, student develops confidence in him/her to fulfill course objectives. - ● Term work includes simple case study/assignment/seminar/visit and in-semester theory examination as a part of learning process encourages students. - ● He/she proves himself/herself to be excellent practical engineer in any tribological industry
Subject(Course Name) and Code:402044C Reliability Engineering (Elective I)
● Understand and analyze different methods of failure. ● Calculate MTTF, MTBF, failure rate and hazard rate. ● Different probability methods applied to Reliability. ● Optimize Cost & reliability. - Perform FEMA, FMECA, DOE, Taguchi method. ● Different methods to test reliability.
Subject(Course Name) and Code:402044D Machine Tool Design (Elective I)
● Design gear box. ● Design different machine tools considering static and dynamic loads. ● Understand effect of vibrations on life of machine tools. - ● Understand design considerations for Special features in Machine tools.
Subject(Course Name) and Code:402045A Gas Turbine and Propulsion (Elective II)
● Demonstrate the gas turbine power plant

- Illustrate the jet propulsion system
- Analyze the performance of gas turbine engine
- Present the technical details of compressors used in gas power systems

Subject(Course Name) and Code:402045B Product Design and Development (Elective II)

- Design a sustainable product. -
- Develop commercial Product -
- Master in new techniques PLM and PDM

Subject(Course Name) and Code:402045C Operation Research (ELECTIVE II)

- Illustrate the need to optimally utilize the resources in various types of industries.
- Apply and analyze mathematical optimization functions to various applications.
- Demonstrate cost effective strategies in various applications in industry.

Subject(Course Name) and Code:402045D Advanced Manufacturing Processes (Elective II)

- Selection of appropriate manufacturing process for advance components
- Characterization of work pieces

Subject(Course Name) and Code:402047Power Plant Engineering

- Ability to have adequacy with Design, erection and development of energy conversion plants. Optimization of Energy Conversion plant with respect to the available resources. -
- Scope of alternative erection of optimized, suitable plant at the location depending upon geographical conditions.

Subject(Course Name) and Code:402048 Mechanical System Design

- The student will understand the difference between component level design and system level design.
- Ability to design various mechanical systems like pressure vessels, machine tool gear boxes, material handling systems, etc. for the specifications stated/formulated.
- Ability to learn optimum design principles and apply it to mechanical components.
- Ability to to handle system level projects from concept to product.

Subject(Course Name) and Code:402049A Refrigeration and Air Conditioning Equipment Design (Elective III)

- Select the different components of refrigeration system i.e. condensers, evaporators, controls etc. for given applications
- Demonstrate the concepts of design of evaporators and condensers for unitary systems Analyses the performance of cooling tower and heap pipe.
- Illustrate the methods for production of ultralow temperature

Subject(Course Name) and Code:402049B Robotics (Elective III)

- Understand the complete design procedure of the robot.
- Select correct mechanism for operation of the robot.
- Select necessary actuators, sensors, control for satisfactory performance of the robot.

Subject(Course Name) and Code:(402049C) Industrial Engineering (Elective III)

- Apply the Industrial Engineering concept in the industrial environment. -
- Manage and implement different concepts involved in methods study and understanding of work content in different situations.
- Undertake project work based on the course content.
- Describe different aspects of work system design and facilities design pertinent to manufacturing industries.
- Identify various cost accounting and financial management practices widely applied in industries.

- Develop capability in integrating knowledge of design along with other aspects of value addition in the conceptualization and manufacturing stage of various products.

Subject(Course Name) and Code:(402050 A) Computational Fluid Dynamics (Elective IV)

- Ability to analyze and model fluid flow and heat transfer problems.
- Ability to generate high quality grids and interpret the correctness of numerical results with physics.
- Ability to use a CFD tool effectively for practical problems and research.
- Ability to conceptualize the programming skills.

Subject(Course Name) and Code:(402050B) Finite Element Analysis (Elective IV)

- Derive and use 1-D and 2-D element stiffness matrices and load vectors from various methods to solve for displacements and stresses.
- Apply mechanics of materials and machine design topics to provide preliminary results used for testing the reasonableness of finite element results.
- Explain the inner workings of a finite element code for linear stress, displacement, temperature and modal analysis.
- Interpret the results of finite element analyses and make an assessment of the results in terms of modeling (physics assumptions) errors, discretization (mesh density and refinement toward convergence) errors, and numerical (round-off) errors.

Subject(Course Name) and Code:(402050C) Design of Pumps, Blowers and Compressors (Elective IV)

- Select suitable Pump, Blower, fan or compressor for a given application.
- Design Pump, Blower, fan or compressor for a given application

Department of Information Technology Engineering

Semester: I & II(second YEAR)

Subject(Course Name) and Code: 214441 DISCRETE STRUCTURES

Course Outcomes

- Use set, relation and function to formulate a problem and solve it
- Use graph theory and trees to formulate the problems and solve them
- Use mathematical propositions and proof techniques to check the truthfulness of a real life situation

Subject(Course Name) and Code:214442 COMPUTER ORGANIZATION &ARCHITECTURE

1. Solve problems based on computer arithmetic.
2. Explain processor structure & its functions.
3. Obtain knowledge about micro-programming of a processor.
4. Understand concepts related to memory & IO organization.

Subject(Course Name) and Code:214443 DIGITAL ELECTRONICS AND LOGIC DESIGN

- Spectacle an awareness and apply knowledge of number systems, codes, Boolean algebra and use necessary A.C, D.C Loading characteristics as well as functioning while designing with logic gates.
- Use logic function representation for simplification with K-Maps and analyze as well as design Combinational logic circuits using SSI & MSI chips.
- Analyze Sequential circuits like Flip-Flops (Truth Table, Excitation table), their conversion & design the applications.

- Identify the Digital Circuits, Input/Outputs to replace by FPGA
- Use VHDL programming technique with different modeling styles for any digital circuits

Subject(Course Name) and Code:214444 FUNDAMENTAL OF DATA STRUCTURES

- 1. Apply appropriate constructs of C language, coding standards for application development.
- 2. Use dynamic memory allocation concepts and file handling in various application developments.
- 3. Perform basic analysis of algorithms with respect to time and space complexity
- 4. Select appropriate searching and/or sorting techniques in the application development
- 5. Select and use appropriate data structures for problem solving and programming
- 6. Use algorithmic foundations for solving problems and programming

Subject(Course Name) and Code:214445 PROBLEM SOLVING AND OBJECT ORIENTED PROGRAMMING

- Develop algorithms for solving problems by using modular programming concepts
- Abstract data and entities from the problem domain, build object models and design software solutions using object-oriented principles and strategies

Discover, explore and apply tools and best practices in object-oriented programming.

- Develop programs that appropriately utilize key object-oriented concepts

Subject(Course Name) and Code:COMMUNICATION SKILL 214449

- Provides an ability to understand, analyze and interpret the essentiality of grammar and its proper usage.
- Build the students' vocabulary by means of communication via web, direct
- Communication and indirect communication.
- Improves Students' Pronunciation skills and understanding between various phonetic sounds during communication.
- Understanding the various rules and means of written communication.
- Effective communication with active listening, facing problems while communication and how to overcome it.

Department of Information Technology Engineering

Semester: I & II(THIRD YEAR)

Subject(Course Name) and Code: 314441 COMPUTER NETWORK TECHNOLOGY

- Students will be able to understand the OSI model and its layer responsibilities in detail
- Students will be able to explain various routing protocols and techniques and its related management issues at large
- Students will be able to understand working principle of client/server application with respect
- to application ler protocols
- Students will obtain thorough knowledge of various Wireless technologies"

Subject(Course Name) and Code: 314442 THEORY OF COMPUTATION

"Course Outcomes :

- Students should be able to understand and design Regular Grammar, Finite Automata, Context
- Free Grammar, Pushdown Automata, Post Machines, and Turing Machines.
- Students should be able to Simplify Context Free Grammar and then convert to CNF and GNF.
- Students should be able to understand Pumping Lemma, Properties of Regular Languages and
- Context Free Languages.
- Students should be able to understad Decidable Languages and Turing Reducibility

Subject(Course Name) and Code: 314443 DATABASE MANAGEMENT SYSTEMS

- Define basic functions of DBMS & RDBMS.

Analyze database models & entity relationship models.

- Design and implement a database schema for a given problem-domain
- Populate and query a database using SQL DML/DDL commands.

Programming PL/SQL including stored procedures, stored functions, cursors and packages

- Appreciate the impact of analytics and big data on the information industry and the external ecosystem.
- Students should be able to understad Decidable Languages and Turing Reducibility

Subject(Course Name) and Code: 314444 SOFTWARE ENGINEERING

- Identify unique features of various software application domains and classify software
- applications.
- Choose and apply appropriate lifecycle model of software development.
- Describe principles of agile development, discuss the SCRUM process and distinguish agile
- process model from other process models.
- Identify user needs and formulate software specifications.
- Analyze software requirements by applying various modeling techniques.
- Translate the requirements model into the design model

Subject(Course Name) and Code: 314445 WEB ENGINEERING AND TECHNOLOGY

- At the end of this course, students would be able toapply the concepts, principles and methods of Web engineering, have a sufficient theoretical knowledge and analytical skills to develop Web applications
- apply the described concepts, principles and methods to development of complex Web
  - applications
- design and develop website using current Web technologies and model, visualize and document the analysis and design of Web applications
- Analyze software requirements by applying various modeling techniques.
- Translate the requirements model into the design model

Subject(Course Name) and Code: 314441 THEORY OF COMPUTATION

- To construct finite state machines to solve problems in computing.
- To write mathematical expressions for the formal languages
- To apply well defined rules for syntax verification.
- To construct and analyze Push Down, Post and Turing Machine for formal languages.
- To express the understanding of the decidability and decidability problems."

Subject(Course Name) and Code: 314442 DATABASE MANAGEMENT SYSTEMS

- To define basic functions of DBMS & RDBMS.
- To analyze database models & entity relationship models.
- To design and implement a database schema for a given problem-domain.
- To populate and query a database using SQL DML/DDL commands.
- Do Programming in PL/SQL including stored procedures, stored functions, cursors and packages.
- To appreciate the impact of analytics and big data on the information industry and the external ecosystem.

Subject(Course Name) and Code: 314443 SOFTWARE ENGINEERING AND PROJECT MANAGEMENT

- To identify unique features of various software application domains and classify software applications.
- To choose and apply appropriate lifecycle model of software development.
- To describe principles of agile development, discuss the SCRUM process and distinguish agile process model from other process models.
- To analyze software requirements by applying various modeling techniques.
- To list and classify CASE tools and discuss recent trends and research in software engineering.
- To understand IT project management through life cycle of the project and future trends in IT Project

Subject(Course Name) and Code: 314443 SOFTWARE ENGINEERING AND PROJECT MANAGEMENT

To identify unique features of various software application domains and classify software applications.

To choose and apply appropriate lifecycle model of software development.

- To describe principles of agile development, discuss the SCRUM process and distinguish agile process model from other process models.
- To analyze software requirements by applying various modeling techniques.
- To list and classify CASE tools and discuss recent trends and research in software engineering.
- To understand IT project management through life cycle of the project and future trends in IT Project"

Subject(Course Name) and Code: 314444 OPERATING SYSTEM

- Fundamental understanding of the role of Operating Systems.
- To understand the concept of a process and thread.
- To apply the cons of process/thread scheduling.
- To apply the concept of process synchronization, mutual exclusion and the deadlock.
- To realize the concept of I/O management and File system.
- To understand the various memory management techniques.

Subject(Course Name) and Code: 314445 HUMAN-COMPUTER INTERACTION

- To explain importance of HCI study and principles of user-centred design (UCD) approach.
- To develop understanding of human factors in HCI design.
- To develop understanding of models, paradigms and context of interactions.
- To design effective user-interfaces following a structured and organized UCD process.
- To evaluate usability of a user-interface design.

- To apply cognitive models for predicting human-computer-interactions."
- recent trends and research in software engineering.
- To understand IT project management through life cycle of the project and future trends in IT Project

Subject(Course Name) and Code: AUDIT COURSE

- To understand the importance of environment friendly society.
- To apply primary measures to reduce carbon emissions from their surroundings.
- To learn role of IT solutions in design of green buildings.
- To understand the use of software systems to complete statutory compliances involved in the design nt trends and research in software engineering.
- To understand IT project management through life cycle of the project and future trends in IT Project"

Department of Information Technology Engineering

Semester: I & II(FINAL YEAR)

Subject(Course Name) and Code: 414453 INFORMATION AND CYBER SECURITY

- Students shall be able to understand what are the common threats faced today
- What is the foundational theory behind information security
- What are the basic principles and techniques when designing a secure system
- How today's attacks and defenses work in practice
- How to assess threats for their significance
- How to gauge the protections and limitations provided by today's technology

Subject(Course Name) and Code: 414454 SOFTWARE MODELING AND DESIGN

1. understand the usage of various UML diagrams to build a model
2. prepare an object oriented model in business domain of an application.
3. prepare an object oriented model in solution domain.
4. apply object oriented principles in the design of software system.
5. get started on study of GOF design patterns.
6. understand different types of software testing

Subject(Course Name) and Code: 414455 MACHINE LEARNING

- Students will be able to model the learning primitives.
- Students will be able to build the learning model.
- Student will be able to tackle real world problems in the domain of Data Mining, Information"
- understand different types of software testing

Subject(Course Name) and Code:414456 A ELECTIVE I : SOFT COMPUTING

- Students will be inspired to solve complex real-world problems.
- Students will correlate human-like processing in problem solving with current technologies in various domains like Bio Informatics, Multimedia Systems, Big Data Analytics, etc."

Subject(Course Name) and Code: 414456 B ELECTIVE I : USABILITY ENGINEERING

- "At the end of this course, student should be able to:
- Justify the need to study human-computer-interaction or human-factors while designing software.

- Discuss the process of designing user-friendly software based on usability engineering guidelines.
- Apply interaction design and UI design process in enhancing user-experience of an application.
- Conduct usability evaluation of user-interfaces or software applications.
- Discuss industry standards for designing and evaluating user-interfaces.
- Discuss current trends in usability engineering"

Subject(Course Name) and Code:414456 C ELECTIVE I : MODERN COMPILERS
"1. Understand the performance characteristics of modern processors 2. Be familiar with compiler architecture and implementation. 3. Be familiar with register allocation. 4. Be exposed to compiler optimization." and UI design process in enhancing user-experience of an application. 4. Conduct usability evaluation of user-interfaces or software applications. 5. Discuss industry standards for designing and evaluating user-interfaces. 6. Discuss current trends in usability engineering"
Subject(Course Name) and Code: 414456 ELECTIVE I : PARALLEL ALGORITHMS AND DESIGN
1. To study the parallel architecture of the processor. 2. To study various parallel algorithmic strategies and their comparison with traditional algorithmic strategies. 3. To study the analysis of parallel algorithms in terms of time and space complexity. 4. To classify the parallel algorithm in complexity class. 5. To understand the recent applications of Parallel algorithms" . Discuss industry standards for designing and evaluating user-interfaces. 6. Discuss current trends in usability engineering"
Subject(Course Name) and Code: 414456 E ELECTIVE I : CLOUD COMPUTING
"1. Understand and Familiar with the basic concepts of cloud computing. 2. Understand how to build large scale distributed systems and cloud applications. 3. Comprehend the importance of cloud security. 4. Understand Ubiquitous Computing and applications
Subject(Course Name) and Code: 414457 A ELECTIVE II : BUSINESS INTELLIGENCE
Design and implement OLTP, OLAP and Warehouse concepts. 2. Design and develop Data Warehouse using Various Schemas & Dimensional modelling. 3. Use the ETL concepts, tools and techniques to perform Extraction, Transformation, and Loading of data. 4. Report the usable data by using various reporting concepts, techniques/tools, and use charts, tables for reporting in BI. 5. Use Analytics concepts like data mining, Exploratory and statistical techniques for predictive analysis in Business Intelligence. 6. Demonstrate application of concepts in BI."
Subject(Course Name) and Code:ELECTIVE II : SERVICE ORIENTED ARCHITECTURE ICE ORIENTED ARCHITECTURE
• Students will be able to know the importance of SOA. • Students will be able to know SOA primitives.

- Students will be able to analyze quality web services.
- Students will be able to design and develop web services

Subject(Course Name) and Code:414457 C ELECTIVE II : E & M GOVERNANCE

- Explain what E & M Governance is.
- Understand the consequences of E-Commerce and M-Commerce.
- Describe E-Procurements and E-Business Networks.
- Define E-Commerce and M-Commerce services for consumers and businesses.
- Understand E & M Governance standards and service development technology"

Subject(Course Name) and Code:414457 D ELECTIVE II : GEO-INFORMATICS SYSTEMS

- Students will understand basics of Remote Sensing & GIS.
- Students will able to analyze GIS data and GIS applications."

Subject(Course Name) and Code:414457 E ELECTIVE II : NATURAL LANGUAGE PROCESSING

- Automatic processing and information extraction of human language using computer.
- Learn applications of Natural Language Processing such as Information extraction,

Subject(Course Name) and Code:414458 SOFTWARE LABORATORY – III

- The students will be able to implement and port controlled and secured access to software systems and networks.
- The students will be able to build learning software in various domains .

Subject(Course Name) and Code:414459 SOFTWARE LABORATORY – IV

- Students will be able to identify classes and collaboration from requirements.
- Students will be able to prepare analysis and design model and implement.
- Students will be able to use the test driven development approach in implementation.
- Students will be able to experience Object Oriented Software Development life cycle activities"
- Students will be able to build learning software in various domains .
- Students will be able to design and develop web services ry and statistical techniques

Subject(Course Name) and Code:414461 Distributed System

- Understand the principles and desired properties of distributed systems on which the internet and other distributed systems are based.
- Understand and apply the basic theoretical concepts and algorithms of distributed systems in problem solving.
- Recognize the inherent difficulties that arise due to distributed-ness of computing resources

Subject(Course Name) and Code:414462 Advanced Databases

- Understanding of Advances in Database Architectures for Big data.
- Master the basics of web and object oriented database using XML and JDOQL.
- Master the basic concepts of NoSQL Databases.
- Understand how analytics and big data affect various functions now and in the future.
- Appreciate the impact of analytics and big data on the information industry and the external ecosystem for analytical and data services.

Understanding of current trends in databases

Subject(Course Name) and Code:414463 A ELECTIVE III : MOBILE COMPUTING

- Students will gain knowledge of GSM architecture.
- Students will be able to understand mobility management.
- Students will be able to understand working of wireless architectures and their applications.
- Students will be able to understand recent trends and emerging technologies

Subject(Course Name) and Code:414463B ELECTIVE III : ADVANCED GRAPHICS AND ANIMATION

- Learn recent methods in rendering, modeling, and animation.
- Understand the current models for the interaction of light and materials
- Understand some areas of current computer graphics research.
- Learn and use the production pipeline to create your own animation

Subject(Course Name) and Code:414463 C ELECTIVE III : INFORMATION STORAGE AND RETRIEVAL

- Student should be able to understand the concept of Information retrieval.
- Student should be able to deal with storage and retrieval process of text and multimedia data.
- Student should be able to evaluate performance of any information retrieval system.
- Student should be able to understand importance of recommender system.
- Student should be able to understand concept of multimedia and distributed information

Subject(Course Name) and Code:414463 D ELECTIVE III : IT ENABLED SERVICES

- Students will be able to understand the process of IT Industry
- Students will be able to understand Indian laws of IT industry
- Student will be able to study current trends and services in IT industry
- Student will be able to understand programming concept of IT Web services

Subject(Course Name) and Code:414463 E ELECTIVE III : ADVANCED COMPUTER NETWORKS

- Apply basic principles in designing modern computer networks.
- Use functionality of high speed networks in development of advanced network applications.
- Use advanced routing architecture and protocols in networking.
- Apply performance measures for routing in computer networks.
- Use advanced wireless standards in designing wireless networks

Subject(Course Name) and Code:414463 E 414464 A ELECTIVE IV : BIO INFORMATICS

- Understand basic DNA and RNA structure, features and classification schema for databases, applications in Bioinformatics.
- Use various statistical concepts and visualization tools to discover new patterns in Protein Structures and analyze randomness in data.

- Explore the various Bioinformatics Databases for knowledge discovery given by Data Mining and Pattern Matching techniques through study of various sequence alignment algorithms.
- Offer appropriate solutions for similarity search through similarity search and prediction algorithms.
- Understand modeling and simulation in bioinformatics with the help of simulation and statistical protocols, basic drug discovery process.
- Gain awareness in field of Systems Biology and Human Disease

Subject(Course Name) and Code:414464 B ELECTIVE IV : REAL TIME AND EMBEDDED SYSTEMS

"1. Students should be able to design distributed embedded system for specific example.
2. Students should be able to schedule real time tasks as per the specific requirement."

Subject(Course Name) and Code: 414464 C ELECTIVE IV : GREEN IT – PRINCIPLES AND PRACTICES

Students will be able to create awareness among stakeholders and promote green agenda and green initiatives in their working environments leading to green movement.
This green movement will create new career opportunities for IT professionals, auditors and others with special skills such as energy efficiency, ethical IT assets disposal, carbon footprint estimation, reporting and development of green products, applications and services

Subject(Course Name) and Code: 414464 D ELECTIVE IV : INTERNET OF THINGS

- Explain what Internet of Things is.
- Describe key technologies in Internet of Things.
- Understand wireless sensor network architecture and its framework along with WSN applications.
- Explain resource management in the Internet of Things.
- Understand business models for the Internet of Things

Subject(Course Name) and Code: 414465 SOFTWARE LABORATORY – V

After completion of the subject, the students will be able to:
- Understand the principles on which the internet and other distributed systems are based.
- Understand and apply the basic theoretical concepts and algorithms of distributed systems"

Subject(Course Name) and Code:414466 SOFTWARE LABORATORY – VI

- Understanding of Advanced Database Programming Languages.
- Master the basics of web and object oriented database languages and construct queries using XML and JDOQL.
- Master the basic concepts of NoSQL Databases.
- Understand how analytics and big data affect various functions now and in the future.
- Appreciate the impact of analytics and big data on the information industry and the externa

Description Of Mechanism Of Communication of CO's
The CO's are communicated to the stakeholders by following means/mechanism

Yes, each programme of the college has clearly stated learning outcomes for each course which are mapped to POs. The POs are the attributes which the student is expected to acquire at the time of graduation and COs are the course outcomes that the students imbibe at the end of each course. Learning outcomes (Cos) are further divided in topic learning outcomes (TLOs).Learning outcomes (Cos) are included in course curriculum. These are further mapped to PEOs which are in line with institutes Vision and Mission. The learning outcomes are articulated to the students and staff in the following ways :

Program Outcomes (PO)

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, Natural, science and engineering science.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering

solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes

Computer Engineering

Program Specific Outcomes(PSOs)

A graduate of the Computer Engineering Program will demonstrate-
PSO1: Professional Skills-The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying.
PSO2: Problem-Solving Skills- The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.
PSO3: Successful Career and Entrepreneurship- The ability to employ modern computer

languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies.

Electrical Engineering

PSOs (Program Specific Outcomes):-

PSO1. Electrical Equipment: Maintain various types of rotating and static electrical equipment.
PSO2. Electric Power Systems: Maintain different types of electrical power systems.

Information Technology

Program Specific Outcomes(PSO)

PEO1: "Graduate shall have the ability to exhibit excellence in professional career by demonstrating a positive representation of their brand."
PEO2: " Graduate shall have the ability to learn latest trends coping present and future needs."
PEO3:"Graduate shall have sense of social responsibility by balancing the emotional quotient and strengthening the personal traits. "

Mechanical Engineering

Program Specific Outcomes (PSO)

PEO1 :Graduate shall have abilities to pursue professional career.

PEO 2: Graduate shall have skill and ability to meet emerging industrial demands.

PEO 3: Graduates shall have an ability to address social needs through eco-friendly and cost effective solutions following ethics.

Electronics and Telecommunication Engineering

Program Specific Outcomes (PSO)

PSO1 (Fundamental Knowledge and Analysis): An ability to understand, apply and analyze the engineering problems relevant to Electronics & Telecommunication Engineering.

PSO2 (System Design): Design the Electronics & Telecommunication Engineering systems using latest hardware and software tools by applying significant analytical knowledge.

PSO2 (Societal and Environmental Issues): An understanding societal, environmental, health, safety and cultural issues with ethical responsibility and function effectively as an individual and heterogeneous group.