

Computer Science and Engineering (R16)	
CO-PO Mapping	
I Year I Semester	
Course Outcomes	ENGLISH - I
C01	The lesson motivates the readers to develop their knowledge different fields and serve the society accordingly.
C02	The lesson motivates the public to adopt road safety measures.
C03	The lesson creates an awareness in the readers that mass production is ultimately detrimental to
C04	The lesson helps to choose a source of energy suitable for rural India.
C05	The lesson creates an awareness in the reader as to the usefulness of animals for the human society.
C06	The lesson helps in identifying safety measures against different varieties of accidents at home and in the workplace.
Course Outcomes	MATHEMATICS-I
C01	Solve linear differential equations of first, second and higher order.
C02	Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear
C03	Calculate total derivative, Jacobian and minima of functions of two variables.
Course Outcomes	MATHEMATICS-II (Mathematical Methods)
C01	Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators.
C02	Compute interpolating polynomial for the given data.
C03	Solve ordinary differential equations numerically using Euler's and RK method.
C04	Find Fourier series and Fourier transforms for certain functions.
C05	Identify/classify and solve the different types of partial differential equations.
Course Outcomes	APPLIED PHYSICS
C01	Construction and working details of instruments, ie., Interferometer, Diffractometer
Course Outcomes	COMPUTER PROGRAMMING
C01	Understand the basic terminology used in computer programming
C02	Write, compile and debug programs in C language.
C03	Use different data types in a computer program.
C04	Design programs involving decision structures, loops and functions.
C05	Explain the difference between call by value and call by reference
C06	Understand the dynamics of memory by the use of pointers

C07	Use different data structures and create/update basic data files.
Course Outcomes	ENGLISH - COMMUNICATION SKILLS LAB - I
C01	A study of the communicative items in the laboratory will help the students become successful in the competitive world.
Course Outcomes	APPLIED/ENGINEERING PHYSICS LAB
C01	Physics lab curriculum gives fundamental understanding of design of an instrument with targeted accuracy for physical measurements
Course Outcomes	APPLIED/ENGINEERING PHYSICS - VIRTUAL LABS – ASSIGNMENTS
C01	Physics Virtual laboratory curriculum in the form of assignment ensures an engineering graduate to prepare a /technical/mini-project/ experimental
Course Outcomes	COMPUTER PROGRAMMING LAB
C01	Apply and practice logical ability to solve the problems.
C02	Understand C programming development environment, compiling, debugging, and linking and executing a program using the development environment
C03	Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs
C04	Understand and apply the in-built functions and customized functions for solving the problems.
C05	Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.
C06	Document and present the algorithms, flowcharts and programs in form of user-manuals
C07	Identification of various computer components, Installation of software
I Year II Semester	
Course Outcomes	ENGLISH -II
C01	The lesson underscores that the ultimate aim of Education is to enhance wisdom.
C02	The lesson enables the students to promote peaceful co-existence and universal
C03	The lesson imparts the students to manage different cultural shocks due to globalization.
C04	The theme projects society's need to re examine its traditions when they are outdated.
C05	The lesson offers several inputs to protect environment for the sustainability of the future generations.
C06	Pupil get inspired by eminent personalities who toiled for the present day advancement of software development. 2. ' Srinivasa Ramanujan'
Course Outcomes	MATHEMATICS-III
C01	Determine rank, Eigenvalues and Eigen vectors of a given matrix and solve simultaneous linear equations
C02	. Solve simultaneous linear equations numerically using various matrix methods.
C03	Determine double integral over a region and triple integral over a volume.
C04	4. Calculate gradient of a scalar function, divergence and curl of a vector function.

Course Outcomes	APPLIED CHEMISTRY
C01	The advantages and limitations of plastic materials and their use in design would be
Course Outcomes	OBJECT-ORIENTED PROGRAMMING THROUGH C++
C01	Understand the basic terminology used in computer programming
C02	Write, compile and debug programs in C language. Use different data types in a computer program.
C03	Design programs involving decision structures, loops and functions.
C04	Explain the difference between call by value and call by reference
Course Outcomes	ENVIRONMENTAL STUDIES
C01	The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources
C02	The concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web
C03	The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity
C04	Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices
C05	Social issues both rural and urban environment and the possible means to combat the challenges
C06	The environmental legislations of India and the first global initiatives towards sustainable development.
C07	About environmental assessment and the stages involved in EIA and the environmental audit
C08	Self Sustaining Green Campus with Environment Friendly aspect of – Energy, Water and Wastewater reuse Plantation, Rain water Harvesting, Parking Curriculum.
Course Outcomes	APPLIED / ENGINEERING CHEMISTRY LABORATORY
C01	The students entering into the professional course have practically very little exposure to lab classes. The experiments introduce volumetric analysis; redox
Course Outcomes	ENGLISH - COMMUNICATION SKILLS LAB- II
C01	A study of the communicative items in the laboratory will help the students become successful in the competitive world.
Course Outcomes	OBJECT-ORIENTED PROGRAMMING LAB
C01	Explain what constitutes an object-oriented approach to programming and identify potential benefits of object-oriented programming over other approaches.
C02	Apply an object-oriented approach to developing applications of varying complexities
Course Outcomes	STATISTICS WITH R PROGRAMMING

C01	List motivation for learning a programming language
C02	Access online resources for R and import new function packages into the R workspace
C03	Import, review, manipulate and summarize data-sets in R
C04	Explore data-sets to create testable hypotheses and identify appropriate statistical tests
C05	Perform appropriate statistical tests using R Create and edit visualizations
II Year I Semester	
Course Outcomes	MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE
C01	Student will be able to demonstrate skills in solving mathematical problems
C02	Student will be able to comprehend mathematical principles and logic
C03	Student will be able to demonstrate knowledge of mathematical modeling and proficiency in using mathematical software
C04	Student will be able to manipulate and analyze data numerically and/or graphically using appropriate Software
C05	Student will be able to communicate effectively mathematical ideas/results verbally or in writing
Course Outcomes	DIGITAL LOGIC DESIGN
C01	An ability to define different number systems, binary addition and subtraction, 2's complement representation and operations with this representation.
C02	An ability to understand the different switching algebra theorems and apply them for logic functions.
C03	An ability to define the Karnaugh map for a few variables and perform an algorithmic reduction of logic functions.
C04	An ability to define the other minimization methods for any number of variables Variable Entered Mapping (VEM) and Quine-McCluskey (QM) Techniques and perform an algorithmic reduction of logic functions.
Course Outcomes	PYTHON PROGRAMMING
C01	Making Software easily right out of the box.
C02	Experience with an interpreted Language.
C03	To build software for real needs.
C04	Prior Introduction to testing software
Course Outcomes	DATA STRUCTURES THROUGH C++
C01	Distinguish between procedures and object oriented programming.
C02	Apply advanced data structure strategies for exploring complex data structures.

C03	Compare and contrast various data structures and design techniques in the area of Performance.
C04	Implement data structure algorithms through C++. • Incorporate data structures into the applications such as binary search trees, AVL and B Trees
C05	Implement all data structures like stacks, queues, trees, lists and graphs and compare their Performance and trade offs
Course Outcomes	COMPUTER GRAPHICS
C01	Know and be able to describe the general software architecture of programs that use 3D computer graphics.
C02	Know and be able to discuss hardware system architecture for computer graphics. This Includes, but is not limited to: graphics pipeline, frame buffers, and graphic accelerators/co-processors.
C03	Know and be able to select among models for lighting/shading: Color, ambient light; distant and light with sources; Phong reflection model; and shading (flat, smooth, Gourand, Phong).
Course Outcomes	DATASTRUCTURES THROUGH C++ LAB
C01	Be able to design and analyze the time and space efficiency of the data structure
C02	Be capable to identity the appropriate data structure for given problem
II Year II SEMESTER	
Course Outcomes	SOFTWARE ENGINEERING
C01	Define and develop a software project from requirement gathering to implementation.
C02	Obtain knowledge about principles and practices of software engineering.
C03	Focus on the fundamentals of modeling a software project.
C04	Obtain knowledge about estimation and maintenance of software systems
Course Outcomes	JAVA PROGRAMMING
C01	Understand Java programming concepts and utilize Java Graphical User Interface in Program writing.
C02	Write, compile, execute and troubleshoot Java programming for networking concepts.
C03	Build Java Application for distributed environment.
C04	Design and Develop multi-tier applications
C05	Identify and Analyze Enterprise applications.
Course Outcomes	ADVANCED DATA STRUCTURES
C01	Be able to understand and apply amortised analysis on data structures, including binary search trees, mergable heaps, and disjoint sets.

C02	Have an idea of applications of algorithms in a variety of areas, including linear programming and duality, string matching, game-theory
C03	Understand the implementation and complexity analysis of fundamental algorithms such as RSA, primality testing, max flow, discrete Fourier transform.
Course Outcomes	COMPUTER ORGANIZATION
C01	Students can understand the architecture of modern computer.
C02	They can analyze the Performance of a computer using performance equation
C03	Understanding of different instruction types.
C04	Students can calculate the effective address of an operand by addressing modes
C05	They can understand how computer stores positive and negative numbers.
C06	Understanding of how a computer performs arithmetic operation of positive and negative numbers.
Course Outcomes	FORMAL LANGUAGE AND AUTOMATA THEORY
C01	Classify machines by their power to recognize languages.
C02	Employ finite state machines to solve problems in computing.
C03	Explain deterministic and non-deterministic machines.
C04	Comprehend the hierarchy of problems arising in the computer science.
Course Outcomes	PRINCIPLES OF PROGRAMMING LANGUAGES
C01	Describe syntax and semantics of programming languages
C02	Explain data, data types, and basic statements of programming languages
C03	Design and implement subprogram constructs, Apply object - oriented, concurrency, and event handling programming constructs
C04	Develop programs in Scheme, ML, and Prolog
C05	Understand and adopt new programming languages
Course Outcomes	ADVANCED DATA STRUCTURES LAB
C01	Implement heap and various tree structure like AVL, Red-black, B and Segment trees
C02	Solve the problems such as line segment intersection, convex shell and Voronoi diagram
III Year I Semester	
Course Outcomes	COMPILER DESIGN
C01	Acquire knowledge in different phases and passes of Compiler, and specifying different
C02	Parser and its types i.e. Top-down and Bottom-up parsers.
C03	Construction of LL, SLR, CLR and LALR parse table.

C04	Syntax directed translation, synthesized and inherited attributes.
C05	Techniques for code optimization.
Course Outcomes	UNIX PROGRAMMING
C01	Documentation will demonstrate good organization and readability.
C02	File processing projects will require data organization, problem solving and research.
C03	Scripts and programs will demonstrate simple effective user interfaces.
C04	Scripts and programs will demonstrate effective use of structured programming.
C05	Testing will demonstrate both black and glass box testing strategies.
C06	Project work will involve group participation.
Course Outcomes	DATA BASE MANAGEMENT SYSTEMS
C01	Describe a relational database and object-oriented database
C02	Create, maintain and manipulate a relational database using SQL
C03	Examine issues in data storage and query processing and can formulate appropriate solutions.
C04	Describe ER model and normalization for database design.
C05	Design and build database system for a given real world problem
Course Outcomes	OPERATING SYSTEMS
C01	Design various Scheduling algorithms.
C02	Apply the principles of concurrency.
C03	Design deadlock, prevention and avoidance algorithms.
C04	Compare and contrast various memory management schemes.
C05	Design and Implement a prototype file systems.
C06	Perform administrative tasks on Linux Servers
C07	Introduction to Android Operating System Internals
Course Outcomes	UNIFIED MODELING LAB
C01	Understand the Case studies and design the Model.
C02	Understand how design patterns solve design problems.
C03	Develop design solutions using creational patterns.
Course Outcomes	OPERATING SYSEMS AND LINUX PROGRAMMING LAB
C01	To use Unix utilities and perform basic shell control of the utilities

C02	To use the Unix file system and file access control.
C03	To use of an operating system to develop software
C04	Students will be able to use Linux environment efficiently
C05	Solve problems using bash for shell scripting
C06	Will be able to implement algorithms to solve data mining problems using weka tool
Course Outcomes	DATA BASE MANAGEMENT SYSTEM LAB
C01	Understand, appreciate and effectively explain the underlying concepts of database technologies
C02	Design and implement a database schema for a given problem-domain
C03	Normalize a database
C04	Populate and query a database using SQL DML/DDDL commands.
C05	Declare and enforce integrity constraints on a database using a state-of-the-artRDBMS
C06	Design and build a GUI application using a 4GL
Course Outcomes	PROFESSIONAL ETHICSAND HUMAN VALUES
C01	It gives a comprehensive understanding of a variety issues that are encountered by every professional in discharging professional duties
C02	It provides the student the sensitivity and global outlook in the contemporary world to fulfill the professional obligations effectively.
III Year II Semester	
Course Outcomes	COMPUTER NETWORKS
C01	Understand OSI and TCP/IP models
C02	Analyze MAC layer protocols and LAN technologies
C03	Design applications using internet protocols
C04	Understand routing and congestion control algorithms
C05	Understand how internet works
Course Outcomes	DATA WARE HOUSING AND DATA MINING
C01	Understand stages in building a Data Warehouse
C02	Understand the need and importance of preprocessing techniques
C03	Understand the need and importance of Similarity and dissimilarity techniques
C04	Analyze and evaluate performance of algorithms for Association Rules

C05	Analyze Classification and Clustering algorithms
Course Outcomes	DESIGN AND ANALYSIS OF ALGORITHMS
C01	Argue the correctness of algorithms using inductive proofs and invariants.
C02	Analyze worst-case running times of algorithms using asymptotic analysis.
C03	Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize dynamicprogramming algorithms, and analyze them.
C04	Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize greedy algorithms, and analyze them.
Course Outcomes	SOFTWARE TESTING METHODOLOGIES
C01	Understand the basic testing procedures.
C02	Able to support in generating test cases and test suites.
C03	Able to test the applications manually by applying different testing methods and
C04	Apply tools to resolve the problems in Real time environment.
Course Outcomes	ARTIFICIAL INTELLIGENCE
C01	Identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem.
C02	Formalize a given problem in the language/framework of different AI methods (e.g., as a search problem, as a constraint satisfaction problem, as a
C03	Implement basic AI algorithms (e.g., standard search algorithms or dynamic programming).
C04	•Design and carry out an empirical evaluation of different algorithms on problem formalization, and state the conclusions that the evaluation supports.
Course Outcomes	INTERNET OF THINGS
C01	Demonstrate knowledge and understanding of the security and ethical issues of the Internet of Things
C02	Conceptually identify vulnerabilities, including recent attacks, involving the Internet of Things
C03	Develop critical thinking skills
C04	Compare and contrast the threat environment based on industry and/or device type
Course Outcomes	CYBER SECURITY
C01	Cyber Security architecture principles
C02	Identifying System and application security threats and vulnerabilities
C03	Identifying different classes of attacks
C04	Cyber Security incidents to apply appropriate response
C05	Describing risk management processes and practices

C06	Evaluation of decision making outcomes of Cyber Security scenarios
Course Outcomes	DIGITAL SIGNAL PROCESSING
C01	An ability to apply knowledge of Mathematics, science, and engineering
C02	An ability to design and conduct experiments and interpret data
C03	An ability to design a system, component or process to meet desired needs within realistic
C04	An ability to function as part of a multi-disciplinary team
Course Outcomes	EMBEDDED SYSTEMS
C01	Program an embedded system
C02	Design, implement and test an embedded system.
C03	Explain the general structure of a real-time system
C04	Define the unique design problems and challenges of real-time systems
Course Outcomes	NETWORK PROGRAMMING LAB
C01	Understand and explain the basic concepts of Grid Computing;
C02	Explain the advantages of using Grid Computing within a given environment;
C03	Prepare for any upcoming Grid deployments and be able to get started with a potentially available Grid setup
C04	Discuss some of the enabling technologies e.g. high-speed links and storage area networks
C05	Build computer grids.
Course Outcomes	SOFTWARE TESTING LAB
C01	Find practical solutions to the problems
C02	Solve specific problems alone or in teams
C03	Manage a project from beginning to end
C04	Work independently as well as in teams
Course Outcomes	DATA WARE HOUSING AND DATA MINING LAB
C01	The data mining process and important issues around data cleaning, pre-processing and integration.
C02	The principle algorithms and techniques used in data mining, such as clustering, association mining, classification and prediction.
Course Outcomes	INTELLECTUAL PROPERTY RIGHTS AND PATENTS
C01	IPR Laws and patents pave the way for innovative ideas which are instrumental for inventions to seek Patents

C02	Student get an insight on Copyrights, Patents and Software patents which are instrumental for further advancements.
IV Year I Semester	
Course Outcomes	CRYPTOGRAPHY AND NETWORK SECURITY
C01	To be familiarity with information security awareness and a clear understanding of its importance.
C02	To master fundamentals of secret and public cryptography
C03	To master protocols for security services
C04	To be familiar with network security threats and countermeasures
C05	To be familiar with network security designs using available secure solutions (such asPGP, SSL, IPSec, etc)
Course Outcomes	WEB TECHNOLOGIES
C01	Analyze a web page and identify its elements and attributes.
C02	Create web pages using XHTML and Cascading Styles sheets.
C03	Build dynamic web pages.
C04	Build web applications using PHP.
C05	Programming through PERL and Ruby
C06	Write simple client-side scripts using AJAX
Course Outcomes	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
C01	The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product and the knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs.
C02	One is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units.
C03	The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis and to evaluate various investment project proposals with the help of capital budgeting techniques for decision making.
Course Outcomes	BIG DATA ANALYTICS
C01	Preparing for data summarization, query, and analysis.
C02	Applying data modeling techniques to large data sets
C03	Creating applications for Big Data analytics
C04	Building a complete business data analytic solution
Course Outcomes	INFORMATION RETRIEVAL SYSTEMS

C01	Identify basic theories in information retrieval systems
C02	Identify the analysis tools as they apply to information retrieval systems
C03	Understands the problems solved in current IR systems
C04	Describes the advantages of current IR systems
C05	Understand the difficulty of representing and retrieving documents
C06	Understand the latest technologies for linking, describing and searching the web.
Course Outcomes	MOBILE COMPUTING
C01	Able to think and develop new mobile application.
C02	Able to take any new technical issue related to this new paradigm and come up with a
C03	Able to develop new ad hoc network applications and/or algorithms/protocols
C04	Able to understand & develop any existing or new protocol related to mobile environment
Course Outcomes	CLOUD COMPUTING
C01	Understanding the key dimensions of the challenge of Cloud Computing
C02	Assessment of the economics , financial, and technological implications for selecting cloud computing for own organization
C03	Assessing the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-based applications.
C04	Assessment of own organizations' needs for capacity building and training in cloud computing-related IT areas
Course Outcomes	SOFTWARE PROJECT MANAGEMENT
C01	To match organizational needs to the most effective software development model
C02	To understand the basic concepts and issues of software project management
C03	To effectively Planning the software projects
C04	To implement the project plans through managing people, communications and change
C05	To select and employ mechanisms for tracking the software projects
C06	To conduct activities necessary to successfully complete and close the Software projects
C07	To develop the skills for tracking and controlling software deliverables
C08	To create project plans that address real-world management challenges
Course Outcomes	WEB TECHNOLOGIES LAB

CO1	To acquire knowledge of XHTML, Java Script and XML to develop web applications
CO2	Ability to develop dynamic web content using Java Servlets and JSP
CO3	To understand JDBC connections and Java Mail API
CO4	To understand the design and development process of a complete web application
IV Year – II Semester	
Course Outcomes	DISTRIBUTED SYSTEMS
CO1	Develop a familiarity with distributed file systems.
CO2	Describe important characteristics of distributed systems and the salient architectural features of such systems.
CO3	Describe the features and applications of important standard protocols which are used in distributed systems.
CO4	Gaining practical experience of inter-process communication in a distributed environment
Course Outcomes	MANAGEMENT SCIENCE
CO1	After completion of the Course the student will acquire the knowledge on management functions, global leadership and organizational behavior.
CO2	Will familiarize with the concepts of functional management project management and strategic management.
Course Outcomes	MACHINE LEARNING
CO1	Recognize the characteristics of machine learning that make it useful to real-world problems
CO2	Characterize machine learning algorithms as supervised, semi-supervised, and Unsupervised.
CO3	Have heard of a few machine learning toolboxes.
CO4	Be able to use support vector machines.
CO5	Be able to use regularized regression algorithms.
CO6	Understand the concept behind neural networks for learning non-linear functions.
Course Outcomes	CONCURRENT AND PARALLEL PROGRAMMING
CO1	Understanding improvement of CPP concepts presented
CO2	The number of reinforcement-exercises assigned

C03	The time required for the resolution of exercises
C04	Compliance level with the new model of theoretical teaching
Course Outcomes	ARTIFICIAL NEURAL NETWORKS
C01	This course has been designed to offer as a graduate-level/ final year undergraduate level elective subject to the students of any branch of engineering/ science, having basic foundations of matrix algebra, calculus and preferably (not essential) with a basic knowledge of optimization.
C02	Students and researchers desirous of working on pattern recognition and classification, regression and interpolation from sparse observations; control and optimization are expected to find this course useful. The course covers theories and usage of artificial neural networks (ANN) for problems pertaining to classification (supervised/unsupervised) and regression
C03	The course starts with some mathematical foundations and the structures of artificial neurons, which mimics biological neurons in a grossly scaled down version. It offers mathematical basis of learning mechanisms through ANN. The course introduces perceptrons, discusses its capabilities and limitations as a pattern classifier and later develops concepts of multilayer perceptrons with back propagation learning
Course Outcomes	OPERATION RESEARCH
C01	Methodology of Operations Research
C02	Linear programming: solving methods, duality, and sensitivity analysis.
C03	Integer Programming.
C04	Network flows.
C05	Multi-criteria decision techniques.
C06	Decision making under uncertainty and risk.
C07	Game theory. Dynamic programming.

	ELECTRONICS AND COMMUNICATION ENGINEERING (R16)
	I YEAR - I SEMESTER
COURSE OUTCOMES	ENGLISH - I
C01	Using English languages, both written and spoken, competently and correctly
C02	Improving comprehension and fluency of speech
C03	Gaining confidence in using English in verbal situations
COURSE OUTCOMES	MATHEMATICS - I
C01	Solve linear differential equations of first, second and higher order
C02	Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE
C03	Calculate total derivative, Jacobian and minima of functions of two variables
COURSE OUTCOMES	APPLIED PHYSICS
C01	Construction and working details of instruments, ie, Interferometer, Diffractometer and Polarimeter are learnt
C02	Study EM-fields and semiconductors under the concepts of Quantum mechanics paves way for their optimal
COURSE OUTCOMES	COMPUTER PROGRAMMING
C01	Understand the basic terminology used in computer programming
C02	Write, compile and debug programs in C language
C03	Use different data types in a computer program
C04	Design programs involving decision structures, loops and functions
C05	Explain the difference between call by value and call by reference
C06	Understand the dynamics of memory by the use of pointers
C07	Use different data structures and create/update basic data files
COURSE OUTCOMES	ENGLISH - COMMUNICATION SKILLS LAB- 1
C01	A study of the communicative items in the laboratory will help the students become successful in the competitive world
C02	The course content along with the study material is divided into six units
COURSE OUTCOMES	APPLIED / ENGINEERING PHYSICS LAB
C01	Physics lab curriculum gives fundamental understanding of design of an instrument with targeted accuracy for physical measurements
COURSE OUTCOMES	APPLIED / ENGINEERING PHYSICS VIRTUAL LABS - ASSIGNMENTS
C01	Physics Virtual laboratory curriculum in the form of assignment ensures an engineering graduate to prepare a /technical/mini-project/ experimental report with scientific temper
COURSE OUTCOMES	ENGINEERING WORKSHOP & IT WORKSHOP
C01	Common understanding of concepts, patterns of decentralization implementation in Africa †
C02	Identified opportunities for coordinated policy responses, capacity building and implementation of best practices

C03	Identified instruments for improved decentralization to the local level †
C04	Identified strategies for overcoming constraints to effective decentralization and sustainable management at different levels
	I YEAR - II SEMESTER
COURSE OUTCOMES	ENGLISH - II
C01	Underscores that the ultimate aim of Education is to enhance wisdom
C02	Enables the students to promote peaceful co-existence and universal harmony among people and society
C03	Imparts the students to manage different cultural shocks due to globalization
C04	The theme projects society's need to re examine its traditions when they are outdated
C05	Offers several inputs to protect environment for the sustainability of the future generations
C06	Pupil get inspired by eminent personalities who toiled for the present day advancement of software development
COURSE OUTCOMES	MATHEMATICS - III
C01	Determine rank, Eigenvalues and Eigen vectors of a given matrix and solve simultaneous linear equations
C02	Solve simultaneous linear equations numerically using various matrix methods
C03	Determine double integral over a region and triple integral over a volume
C04	Calculate gradient of a scalar function, divergence and curl of a vector function Determine line, surface and volume integrals Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals
COURSE OUTCOMES	APPLIED CHEMISTRY
C01	The advantages and limitations of plastic materials and their use in design would be understood
C02	Fuels which are used commonly and their economics, advantages and limitations are discussed
C03	Reasons for corrosion and some methods of corrosion control would be understood
C04	The students would be now aware of materials like nanomaterials and fullerenes and their uses. Similarly liquid crystals and superconductors are understood
C05	The importance of green synthesis is well understood and how they are different from conventional methods is also explained.
C06	Conductance phenomenon is better understood. The students are exposed to some of the alternative fuels and their advantages and limitations.
COURSE OUTCOMES	ELECTRICAL & MECHANICAL TECHNOLOGY
C01	Working of I.C. Engines
C02	Modes of Heat transfer
C03	Power transmission by drives and different manufacturing methods
COURSE OUTCOMES	ENVIRONMENTAL STUDIES

C01	The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources
C02	The concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web
C03	The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity
C04	Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices
C05	Social issues both rural and urban environment and the possible means to combat the challenges
C06	The environmental legislations of India and the first global initiatives towards sustainable development
C07	About environmental assessment and the stages involved in EIA and the environmental audit
C08	Self Sustaining Green Campus with Environment Friendly aspect of – Energy, Water and Wastewater reuse Plantation, Rain water Harvesting, Parking Curriculum
COURSE OUTCOMES	DATA STRUCTURES
C01	Apply advanced data structure strategies for exploring complex data structures
C02	Compare and contrast various data structures and design techniques in the area Of Performance
C03	Implement all data structures like stacks, queues, trees, lists and graphs and compare their Performance and trade offs
COURSE OUTCOMES	APPLIED/ENGINEERING CHEMISTRY LABORATORY
C01	The students entering into the professional course have practically very little exposure to lab classes
C02	The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations; then they are exposed to a few instrumental methods of chemical analysis
C03	Thus at the end of the lab course, the student is exposed to different methods of chemical analysis and use of some commonly employed instruments They thus acquire some experimental skills
COURSE OUTCOMES	ENGLISH - COMMUNICATION SKILLS LAB - 2
C01	A study of the communicative items in the laboratory will help the students become successful in the competitive world
C02	The course content along with the study material is divided into six units
COURSE OUTCOMES	COMPUTER PROGRAMMING LAB
C01	Apply and practice logical ability to solve the problems
C02	Understand C programming development environment, compiling, debugging, and linking and executing a program using the development environment

C03	Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs
C04	Understand and apply the in-built functions and customized functions for solving the problems
C05	Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems
C06	Document and present the algorithms, flowcharts and programs in form of user-manuals
C07	Identification of various computer components, Installation of software
	II YEAR - I SEMESTER
COURSE OUTCOMES	ELECTRONIC DEVICES AND CIRCUITS
C01	Understand the basic concepts of semiconductor physics
C02	Understand the formation of p-n junction and how it can be used as a p-n junction as diode in different modes of operation
C03	Know the construction, working principle of rectifiers with and without filters with relevant expressions and necessary comparisons
C04	Understand the construction, principle of operation of transistors, BJT and FET with their V-I characteristics in different configurations
C05	Know the need of transistor biasing, various biasing techniques for BJT and FET and stabilization concepts with necessary expressions
C06	Perform the analysis of small signal low frequency transistor amplifier circuits using BJT and FET in different configurations
COURSE OUTCOMES	SIGNALS & SYSTEMS
C01	Characterize the signals and systems and principles of vector spaces, Concept of orthogonality
C02	Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform
C03	Apply sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back
C04	Understand the relationships among the various representations of LTI systems
C05	Understand the Concepts of convolution, correlation, Energy and Power density spectrum and their relationships
C06	Apply z-transform to analyze discrete-time signals and systems
COURSE OUTCOMES	NETWORK ANALYSIS
C01	Gain the knowledge on basic network elements
C02	Will analyze the RLC circuits behaviour in detailed
C03	Analyze the performance of periodic waveforms
C04	Gain the knowledge in characteristics of two port network parameters (Z, Y, ABCD, h & g)
C05	Analyze the filter design concepts in real world applications
COURSE OUTCOMES	RANDOM VARIABLES & STOCHASTIC PROCESSES
C01	Mathematically model the random phenomena and solve simple probabilistic problems
C02	Identify different types of random variables and compute statistical averages of these random variables

C03	Characterize the random processes in the time and frequency domains
C04	Analyze the LTI systems with random inputs
C05	Apply these techniques to analyze the systems in the presence of different types of noise
COURSE OUTCOMES	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
C01	The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product and the knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs
C02	One is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units
C03	The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis and to evaluate various investment project proposals with the help of capital budgeting techniques for decision making
COURSE OUTCOMES	NETWORKS & ELECTRICAL TECHNOLOGY LAB
C01	Able to analyse RLC circuits and understand resonant frequency and Q-factor
C02	Able to determine first order RC/RL networks of periodic non- sinusoidal waveforms
C03	Able to apply network theorems to analyze the electrical network
C04	Able to describe the performance of dc shunt machine
C05	Able to investigate the performance of 1-phase transformer
C06	Able to perform tests on 3-phase induction motor and alternator to determine their performance characteristic
	II YEAR - II SEMESTER
COURSE OUTCOMES	ELECTRONIC CIRCUIT ANALYSIS
C01	Design and analysis of small signal high frequency transistor amplifier using BJT and FET
C02	Design and analysis of multi stage amplifiers using BJT and FET and Differential amplifier using BJT
C03	Derive the expressions for frequency of oscillation and condition for oscillation of RC and LC oscillators and their amplitude and frequency stability concept
C04	Know the classification of the power and tuned amplifiers and their analysis with performance comparison
COURSE OUTCOMES	CONTROL SYSTEMS
C01	This course introduces the concepts of feedback and its advantages to various control systems
C02	The performance metrics to design the control system in time-domain and frequency domain are introduced
C03	Control systems for various applications can be designed using time-domain and frequency domain analysis
C04	In addition to the conventional approach, the state space approach for the analysis of control systems is also introduced

COURSE OUTCOMES	EM WAVES AND TRANSMISSION LINES
C01	Determine E and H using various laws and applications of electric & magnetic fields
C02	Apply the Maxwell equations to analyze the time varying behavior of EM waves
C03	Gain the knowledge in uniform plane wave concept and characteristics of uniform plane wave in various media
C04	Calculate Brewster angle, critical angle and total internal reflection
C05	Derive the expressions for input impedance of transmission lines
C06	Calculate reflection coefficient, VSWR etc. using smith chart
COURSE OUTCOMES	ANALOG COMMUNICATIONS
C01	Differentiate various Analog modulation and demodulation schemes and their spectral characteristics
C02	Analyze noise characteristics of various analog modulation methods
C03	Analyze various functional blocks of radio transmitters and receivers
C04	Design simple analog systems for various modulation techniques
COURSE OUTCOMES	PULSE AND DIGITAL CIRCUITS
C01	Design linear and non-linear wave shaping circuits
C02	Apply the fundamental concepts of wave shaping for various switching and signal generating circuits
C03	Design different multivibrators and time base generators
C04	Utilize the non sinusoidal signals in many experimental research areas
COURSE OUTCOMES	MANAGEMENT SCIENCE
C01	After completion of the Course the student will acquire the knowledge on management functions, global leadership and organizational behavior
C02	Will familiarize with the concepts of functional management project management and strategic management
	III YEAR - I SEMESTER
COURSE OUTCOMES	COMPUTER ARCHITECTURE AND ORGANIZATION
C01	Students can understand the architecture of modern computer
C02	They can analyze the Performance of a computer using performance equation
C03	Understanding of different instruction types
C04	Students can calculate the effective address of an operand by addressing modes
C05	They can understand how computer stores positive and negative numbers
C06	Understanding of how a computer performs arithmetic operation of positive and negative numbers
COURSE OUTCOMES	LINEAR IC APPLICATIONS
C01	Design circuits using operational amplifiers for various applications
C02	Analyze and design amplifiers and active filters using Op-amp
C03	Diagnose and trouble-shoot linear electronic circuits
C04	Understand the gain-bandwidth concept and frequency response of the amplifier configurations

C05	Understand thoroughly the operational amplifiers with linear integrated circuits
COURSE OUTCOMES	DIGITAL IC APPLICATIONS
C01	Understand the structure of commercially available digital integrated circuit families
C02	Learn the IEEE Standard 1076 Hardware Description Language (VHDL)
C03	Model complex digital systems at several levels of abstractions, behavioral, structural, simulation, synthesis and rapid system prototyping
C04	Analyze and design basic digital circuits with combinatorial and sequential logic circuits using VHDL
COURSE OUTCOMES	DIGITAL COMMUNICATIONS
C01	Determine the performance of different waveform coding techniques for the generation and digital representation of the signals
C02	Determine the probability of error for various digital modulation schemes
C03	Analyze different source coding techniques
C04	Compute and analyze different error control coding schemes for the reliable transmission of digital information over the channel
COURSE OUTCOMES	ANTENNA AND WAVE PROPAGATION
C01	Identify basic antenna parameters
C02	Design and analyze wire antennas, loop antennas, reflector antennas, lens antennas, horn antennas and microstrip antennas
C03	Quantify the fields radiated by various types of antennas
C04	Design and analyze antenna arrays
C05	Analyze antenna measurements to assess antenna's performance
C06	Identify the characteristics of radio wave propagation
COURSE OUTCOMES	PROFESSIONAL ETHICS AND HUMAN VALUES
C01	It gives a comprehensive understanding of a variety of issues that are encountered by every professional in discharging professional duties
C02	It provides the student the sensitivity and global outlook in the contemporary world to fulfil the professional obligations effectively
	III YEAR - II SEMESTER
COURSE OUTCOMES	MICROWAVE ENGINEERING
C01	Design different modes in waveguide structures
C02	Calculate S-matrix for various waveguide components and splitting the microwave energy in a desired direction
C03	Distinguish between Microwave tubes and Solid State Devices, calculation of efficiency of devices
C04	Measure various microwave parameters using a Microwave test bench
COURSE OUTCOMES	VLSI DESIGN
C01	Understand the properties of MOS active devices and simple circuits configured when using them and the reason for such encumbrances as ratio rules by which circuits can be interconnected in silicon
C02	Know three sets of design rules with which nMOS and CMOS designs may be fabricated

C03	Understand the scaling factors determining the characteristics and performance of MOS circuits in silicon
COURSE OUTCOMES	DIGITAL SIGNAL PROCESSING
C01	Apply the difference equations concept in the analyzation of Discrete time systems
C02	Use the FFT algorithm for solving the DFT of a given signal
C03	Design a Digital filter (FIR&IIR) from the given specifications
C04	Realize the FIR and IIR structures from the designed digital filter
C05	Use the Multirate Processing concepts in various applications(eg: Design of phase shifters, Interfacing of digital systems...)
C06	Apply the signal processing concepts on DSP Processor
COURSE OUTCOMES	OOPS THROUGH JAVA (OPEN ELECTIVE)
C01	Understand Java programming concepts and utilize Java Graphical User Interface in Program writing
C02	Write, compile, execute and troubleshoot Java programming for networking concepts
C03	Build Java Application for distributed environment
C04	Design and Develop multi-tier applications
C05	Identify and Analyze Enterprise applications
COURSE OUTCOMES	DATA MINING (OPEN ELECTIVE)
C01	Understand stages in building a Data Warehouse
C02	Understand the need and importance of preprocessing techniques
C03	Understand the need and importance of Similarity and dissimilarity techniques
C04	Analyze and evaluate performance of algorithms for Association Rules
C05	Analyze Classification and Clustering algorithms
	IV YEAR - I SEMESTER
COURSE OUTCOMES	RADAR SYSTEMS
C01	Derive the radar range equation and to solve some analytical problems
C02	Understand the different types of radars and its applications
C03	Understand the concept of tracking and different tracking techniques
C04	Understand the various components of radar receiver and its performance
COURSE OUTCOMES	DIGITAL IMAGE PROCESSING
C01	Perform image manipulations and different digital image processing techniques
C02	Perform basic operations like – Enhancement, segmentation, compression, Image transforms and restoration techniques on image
C03	Analyze pseudo and fullcolor image processing techniques
C04	Apply various morphological operators on images
COURSE OUTCOMES	COMPUTER NETWORKS
C01	Understand OSI and TCP/IP models
C02	Analyze MAC layer protocols and LAN technologies
C03	Design applications using internet protocols
C04	Understand routing and congestion control algorithms
C05	Understand how internet works

COURSE OUTCOMES	OPTICAL COMMUNICATIONS
C01	Choose necessary components required in modern optical communications systems
C02	Design and build optical fiber experiments in the laboratory, and learn how to calculate electromagnetic modes in waveguides, the amount of light lost going through an optical system, dispersion of optical fibers
C03	Use different types of photo detectors and optical test equipment to analyze optical fiber and light wave systems
C04	Choose the optical cables for better communication with minimum losses Design, build, and demonstrate optical fiber experiments in the laboratory
COURSE OUTCOMES	ELECTRONIC SWITCHING SYSTEMS (Elective- I)
C01	Evaluate the time and space parameters of a switched signal
C02	Establish the digital signal path in time and space, between two terminals
C03	Evaluate the inherent facilities within the system to test some of the SLIC, CODEC and digital switch functions
C04	Investigate the traffic capacity of the system
C05	Evaluate methods of collecting traffic data
C06	Evaluate the method of interconnecting two separate digital switches
COURSE OUTCOMES	EMBEDDED SYSTEMS (ELECTIVE - II)
C01	Understand the basic concepts of an embedded system and able to know an embedded system design approach to perform a specific function
C02	The hardware components required for an embedded system and the design approach of an embedded hardware
C03	The various embedded firmware design approaches on embedded environment
C04	Understand how to integrate hardware and firmware of an embedded system using real time operating system
COURSE OUTCOMES	ANALOG IC DESIGN (ELECTIVE - II)
C01	Understand the concepts of MOS Devices and Modeling
C02	Design and analyze any Analog Circuits in real time applications
C03	Extend the Analog Circuit Design to Different Applications in Real Time
C04	Understand of Open-Loop Comparators and Different Types of Oscillators
	IV YEAR - II SEMESTER
COURSE OUTCOMES	CELLULAR AND MOBILE COMMUNICATIONS
C01	Identify the limitations of conventional mobile telephone systems; understand the concepts of cellular systems
C02	Understand the frequency management, channel assignment strategies and antennas in cellular systems
C03	Understand the concepts of handoff and architectures of various cellular systems
COURSE OUTCOMES	ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
C01	Select the instrument to be used based on the requirements
C02	Understand and analyze different signal generators and analyzers
C03	Understand the design of oscilloscopes for different applications
C04	Design different transducers for measurement of different parameters

COURSE OUTCOMES	SATELLITE COMMUNICATIONS
C01	Understand the concepts, applications and subsystems of Satellite communications
C02	Derive the expression for G/T ratio and to solve some analytical problems on satellite link design
C03	Understand the various types of multiple access techniques and architecture of earth station design
C04	Understand the concepts of GPS and its architecture
COURSE OUTCOMES	DIGITAL IC DESIGN (ELECTIVE-III)
C01	Understand the concepts of MOS Design
C02	Design and analysis of Combinational and Sequential MOS Circuits
C03	Extend the Digital IC Design to Different Applications
C04	Understand the Concepts of Semiconductor Memories, Flash Memory, RAM array organization
COURSE OUTCOMES	OPERATING SYSTEMS (ELECTIVE-III)
C01	Design various Scheduling algorithms
C02	Apply the principles of concurrency
C03	Design deadlock, prevention and avoidance algorithms
C04	Compare and contrast various memory management schemes
C05	Design and Implement a prototype file systems
C06	Perform administrative tasks on Linux Servers
C07	Introduction to Android Operating System Internals

MECHANICAL ENGINEERING (R16)	
I YEAR I-SEMESTER	
COURSE OUTCOMES	MATHEMATICS-1
CO1	Solve linear differential equations of first, second and higher order
CO2	Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE.
CO3	Calculate total derivative, Jacobian and minima of functions of two variables.
COURSE OUTCOMES	ENGINEERING CHEMISTRY
CO1	: The advantages and limitations of plastic materials and their use in design would be understood. Fuels which are used commonly and their economics, advantages and limitations are discussed. Reasons for corrosion and some methods of corrosion control would be understood. The students would be now aware of materials like nano materials and fullerenes and their uses. Similarly liquid crystals and superconductors are understood. The importance of green synthesis is well understood and how they are different from conventional methods is also explained. The impurities present in raw water, problems associated with them and how to avoid them are understood. The advantages and limitations of plastic materials and their use in design would be understood. The commonly used industrial materials are introduced.
COURSE OUTCOMES	COMPUTER PROGRAMMING
CO1	Understand the basic terminology used in computer programming
CO2	Write, compile and debug programs in C language.
CO3	Use different data types in a computer program
CO4	Design programs involving decision structures, loops and functions.
CO5	Explain the difference between call by value and call by reference
CO6	Use different data structures and create/update basic data files.
COURSE OUTCOMES	ENVIRONMENTAL STUDIES
CO1	The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources
CO2	The concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web
CO3	The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity
CO4	Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices
CO5	Self Sustaining Green Campus with Environment Friendly aspect of – Energy, Water and Wastewater reuse Plantation, Rain water Harvesting, Parking Curriculum.
CO6	The environmental legislations of India and the first global initiatives towards sustainable development.
COURSE OUTCOMES	ENGINEERING / APPLIED CHEMISTRY LABORATORY

C01	The students entering into the professional course have practically very little exposure to lab classes. The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations; then they are exposed to a few instrumental methods of chemical analysis. Thus at the end of the lab course, the student is exposed to different methods of chemical analysis and use of some commonly employed instruments. They thus acquire some experimental skills.
COURSE OUTCOMES	ENGLISH - COMMUNICATION SKILLS LAB- I
C01	A study of the communicative items in the laboratory will help the students become successful in the competitive world.
C02	The course content along with the study material is divided into six units.
COURSE OUTCOMES	COMPUTER PROGRAMMING LAB
C01	Apply and practice logical ability to solve the problems
C02	Understand C programming development environment, compiling, debugging, and linking and executing a program using the development environment
C03	Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs
C04	Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.
C05	Identification of various computer components, Installation of software
COURSE OUTCOMES	ENGLISH - I
C01	The lesson motivates the readers to develop their knowledge different fields and serve the society accordingly.
C02	Acquisition of writing skills
C03	The lesson motivates the public to adopt road safety measures.
C04	The lesson creates an awareness in the readers that mass production is ultimately detrimental to biological survival.
C05	To bring into focus different sources of energy as alternatives to the depleting sources.
C06	The lesson helps in identifying safety measures against different varieties of accidents at home and in the workplace.
	I YEAR II-SEMESTER
COURSE OUTCOMES	ENGLISH -II
C01	The lesson underscores that the ultimate aim of Education is to enhance wisdom.
C02	The lesson enables the students to promote peaceful co-existence and universal harmony among people and society.
C03	The Achievements of C V Raman are inspiring and exemplary to the readers and all scientists.
C04	The lesson imparts the students to manage different cultural shocks due to globalization.
C05	The seminal contributions of Homi Jehangir Bhabha to Indian nuclear programme provide an aspiration to the readers to serve the nation and strengthen it

COURSE OUTCOMES	MATHEMATICS – II
C01	Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators.
C02	Compute interpolating polynomial for the given data.
C03	Solve ordinary differential equations numerically using Euler’s and RK method
C04	Find Fourier series and Fourier transforms for certain functions.
C05	Identify/classify and solve the different types of partial differential equations.
COURSE OUTCOMES	MATHEMATICS-III
C01	Determine rank, Eigen values and Eigen vectors of a given matrix and solve simultaneous linear equations.
C02	Solve simultaneous linear equations numerically using various matrix methods.
C03	Determine double integral over a region and triple integral over a volume.
C04	Calculate gradient of a scalar function, divergence and curl of a vector function. Determine line, surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals.
COURSE OUTCOMES	ENGINEERING PHYSICS
C01	Construction and working details of instruments, ie., Interferometer, Diffractometer and Polarimeter are learnt. Study Acoustics, crystallography magnetic and dielectric materials enhances the utility aspects of materials
COURSE OUTCOMES	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
C01	Able to understand the operation of DC generators,3-point starter and DC machine testing by Swinburne’s Test.
C02	Able to analyse the performance of single-phase transformer.
C03	Able to explain the operation of 3-phase alternator and 3-phase induction motors.
C04	Able to analyse the operation of half wave, full wave bridge rectifiers and OP-AMPs.
C05	Able to explain the single stage CE amplifier and concept of feedback amplifier.
C06	Able to analyse the various electrical networks.
COURSE OUTCOMES	ENGLISH-COMMUNICATIONS SKILLS LAB-II
C01	A study of the communicative items in the laboratory will help the students become successful in the competitive world.
C02	The course content along with the study material is divided into six units
COURSE OUTCOMES	ENGINEERING / APPLIED PHYSICS LAB
C01	Physics lab curriculum gives fundamental understanding of design of an instrument with targeted accuracy for physical measurements
COURSE OUTCOMES	ENGINEERING / APPLIED PHYSICS - VIRTUAL LABS – ASSIGNMENTS

C01	Physics Virtual laboratory curriculum in the form of assignment ensures an engineering graduate to prepare a /technical/mini-project/ experimental report with scientific temper.
COURSE OUTCOMES	ENGINEERING WORKSHOP & IT WORKSHOP
C01	Common understanding of concepts, patterns of decentralization implementation in Africa †
C02	Identified opportunities for coordinated policy responses, capacity building and implementation of best practices †
C03	Identified instruments for improved decentralization to the local level †
C04	Identified strategies for overcoming constraints to effective decentralization and sustainable management at different levels
	II YEAR I-SEMESTER
COURSE OUTCOMES	METALLURGY & MATERIALS SCIENCE
C01	To understand the regions of stability of the phases that can occur in an alloy system in order to solve the problems in practical metallurgy.
C02	To know the basic concepts of bonds in metals and alloys. To understand the basic requirements for the formation of solid solutions and other compounds
C03	To study the basic differences between cast irons and steels, their properties and practical applications.
C04	To study the affect of various alloying elements on iron-iron carbide system. To understand the various heat treatment and strengthening processes used in practical applications
C05	To study the properties and applications of widely used non-ferrous metals and alloys so as to use the suitable material for practical applications.
C06	To study the properties and applications of ceramic, composite and other advanced materials so as to use the suitable material for practical applications.
COURSE OUTCOMES	MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS
C01	The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product and the knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs.
C02	One is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units.
C03	The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis and to evaluate various investment project proposals with the help of capital budgeting techniques for decision making
COURSE OUTCOMES	MECHANICS OF SOLIDS

C01	After studying this unit student will know the basic terms like stress, strain, Poisson's ratio...etc and stresses in bars of varying cross sections, composite bars, thermal stress in members, stresses on inclined planes with analytical approach and graphical approach, strain energy under different loadings and also problem solving techniques.
C02	After studying this unit student will know the construction of shear force diagrams and bending moment diagrams to the different loads for the different support arrangements and also problem solving techniques.
C03	After studying this unit student will know the bending and shear stress induced in the beams which are made with different cross sections like rectangular, circular, triangular, I, T angle sections and also problem solving techniques.
C04	After studying this unit student will know how to find slope and deflection for different support arrangements by Double integration method, Macaulay's method and Moment-Area and also problem solving techniques.
C05	After studying this unit student will know how to find slope and deflection for different support arrangements by Double integration method, Macaulay's method and Moment-Area and also problem solving techniques.
COURSE OUTCOMES	THERMODYNAMICS
C01	The student should be able to understand the basic concepts like thermodynamic system, its boundary and related fundamental definitions. Distinction between point function and path function shall be made with respect to energy, work and Heat.
C02	To learn the first law of thermodynamics, which is also the energy conservation principle, and should be able to apply to different thermodynamic systems. To understand the concept of equality of temperature and the principle of operation of various temperature measuring devices. To learn the applications of steady flow energy equation to the various mechanical components.
C03	To understand the second law statements and the associated terms and should be able to apply the principles to heat engines. Should be able to analyse the concepts of Carnot cycle, entropy, availability and irreversibility. Should be able to understand the use of Maxwell's relations and thermodynamic functions.
C04	Should be able to use Psychrometric chart and calculate various psychrometric properties of air.
C05	To understand the concept of air standard cycles and should be able to calculate the efficiency and performance parameters of the systems that use these cycles.
COURSE OUTCOMES	FLUID MECHANICS & HYDRAULIC MACHINES
C01	After studying this unit student will know the concept of fluid and its properties, manometry, hydrostatic forces acting on different surfaces and also problem solving techniques.
C02	In this unit student will be exposed to the basic laws of fluids, flow patterns, viscous flow through ducts and their corresponding problems.

C03	At the end of this unit student will be aware of the concepts related to boundary layer theory, flow separation, basic concepts of velocity profiles, dimensionless numbers and dimensional analysis.
C04	In this unit student will know the hydrodynamic forces acting on vanes and their performance evaluation.
C05	At the end of this unit student will be aware of the importance, function and performance of hydro machinery
C06	After studying this unit student will be in a position to evaluate the performance characteristics of hydraulic turbines. Also a little knowledge on hydraulic systems and fluidics is imparted to the student.
COURSE OUTCOMES	COMPUTER AIDED ENGINEERING DRAWING PRACTICE
C01	The knowledge of projections of solids is essential in 3D modelling and animation. The student will be able to draw projections of solids. The objective is to enhance the skills they already acquired in their earlier course in drawing of projection.
COURSE OUTCOMES	ELECTRICAL & ELECTRONICS ENGINEERING LAB
C01	Able to find out the efficiency of dc shunt machine without actual loading of the machine.
C02	Able to estimate the efficiency and regulation for different load conditions and power factors of single phase transformer with OC and SC test.
C03	Able to analyse the performance characteristics and to determine efficiency of DC shunt motor & 3-phase induction motor
C04	Able to determine the ripple factor of half wave & full wave rectifiers
C05	Able to find out the characteristics of PN junction diode & transistor
COURSE OUTCOMES	MECHANICS OF SOLIDS & METALLURGY LAB
C01	To impart practical exposure on the microstructures of various materials and their hardness evaluation. Also to impart practical knowledge on the evaluation of material properties through various destructive testing procedures.
	II YEAR II-SEMESTER
COURSE OUTCOMES	KINEMATICS OF MACHINERY
C01	The objective of this unit is to make student understand the purpose of kinematics, Kinematic joint and mechanism and to study the relative motion of parts in a machine without taking into consideration the forces involved
C02	The objective of this unit is to make student understand various mechanisms for straight line motion and their applications including steering mechanism
C03	The objective of this unit is to make student understand the velocity and acceleration concepts and the methodology using graphical methods and principles and application of four bar chain. To understand the application of slider crank mechanism etc. and study of plane motion of the body
C04	The objective of this unit is to make student understand the theories involved in cams. Further the students are exposed to the applications of cams and their working principles.

C05	The objective of this unit is to make student understand gears, power transmission through different types of gears including gear profiles and its efficiency.
COURSE OUTCOMES	THERMAL ENGINEERING – I
C01	To make the student learn and understand the reasons and affects of various losses that occur in the actual engine operation
C02	To familiarize the student with the various engine systems along with their function and necessity.
C03	To learn about normal combustion phenomenon and knocking in S.I. and C.I. Engines and to find the several engine operating parameters that affect the smooth engine operation.
C04	To make the student learn to perform testing on S.I and C.I Engines for the calculations of performance and emission parameters.
C05	To make students learn about different types of compressors and to calculate power and efficiency of reciprocating compressors
COURSE OUTCOMES	PRODUCTION TECHNOLOGY
C01	To impart basic knowledge and understanding about the primary manufacturing processes such as casting, joining, bulk forming, sheet metal forming and powder metallurgy and their relevance in current manufacturing industry; To introduce processing methods of plastics.
COURSE OUTCOMES	DESIGN OF MACHINE MEMBERS – I
C01	The student shall gain appreciation and understanding of the design function in mechanical engineering, the steps involved in designing and the relation of design activity with manufacturing activity
C02	Selection of proper materials to different machine elements based on their physical and mechanical properties
C03	Learn and understanding of the different types of failure modes and criteria
C04	Procedure for the different machine elements such as fasteners, shafts, couplings, keys, axially loaded joints etc.
C05	Identify the loads, the machine members subjected and calculate static and dynamic stresses to ensure safe design.
COURSE OUTCOMES	MACHINE DRAWING
C01	To provide basic understanding and drawing practice of various joint, simple mechanical parts
C02	The student will be able to draw the assembly from the individual part drawing.
COURSE OUTCOMES	INDUSTRIAL ENGINEERING AND MANAGEMENT
C01	Design and conduct experiments, analyse, interpret data and synthesize valid conclusions
C02	Design a system, component, or process, and synthesize solutions to achieve desired needs
C03	Use the techniques, skills, and modern engineering tools necessary for engineering practice with appropriate considerations for public health and safety, cultural, societal, and environmental constraints

CO4	Function effectively within multi-disciplinary teams and understand the fundamental precepts of effective project management
COURSE OUTCOMES	FLUID MECHANICS & HYDRAULIC MACHINES LAB
CO1	To impart practical exposure on the performance evaluation methods of various flow measuring equipment and hydraulic turbines and pumps.
COURSE OUTCOMES	PRODUCTION TECHNOLOGY LAB
CO1	To impart hands-on practical exposure on manufacturing processes and equipment
	III YEAR I-SEMESTER
COURSE OUTCOMES	DYNAMICS OF MACHINERY
CO1	Analyze stabilization of sea vehicles, aircrafts and automobile vehicles
CO2	Compute frictional losses, torque transmission of mechanical systems.
CO3	Analyze dynamic force analysis of slider crank mechanism and design of flywheel.
CO4	Understand how to determine the natural frequencies of continuous systems starting from the general equation of displacement
CO5	Understand balancing of reciprocating and rotary masses.
COURSE OUTCOMES	METAL CUTTING & MACHINE TOOLS
CO1	Apply cutting mechanics to metal machining based on cutting force and power consumption.
CO2	Operate lathe, milling machines, drill press, grinding machines, etc.
CO3	Select cutting tool materials and tool geometries for different metals.
CO4	Learn machining economics.
CO5	Learn principles of CNC Machines
COURSE OUTCOMES	DESIGN OF MACHINE MEMBERS- II
CO1	The student will be able to select the suitable bearing based on the application of the loads and predict the life of the bearing
CO2	Design power transmission elements such as gears, belts, chains, pulleys, ropes, levers and power screws.
CO3	Design of IC Engines parts.
COURSE OUTCOMES	OPERATIONS RESEARCH
CO1	After completion of the course, the student will be able to:
CO2	To solve the LP and DP problems
CO3	To solve the Transportation, assignment, game, inventory, replacement, sequencing, queuing problems
COURSE OUTCOMES	THERMAL ENGINEERING - II
CO1	After undergoing this course the student is expected to understand the working of steam and gas power plant cycles and also should be able to analyze and evaluate the performance of individual components. The student also should be in a position to understand basic principles of Jet propulsion and rocket engineering.

COURSE OUTCOMES	MACHINE TOOLS LAB
C01	The students can operate different machine tools with understanding of work holders and operating principles to produce different part features to the desired quality.
COURSE OUTCOMES	IPR & PATENTS
C01	IPR Laws and patents pave the way for innovative ideas which are instrumental for inventions to seek Patents
C02	Student get an insight on Copyrights, Patents and Software patents which are instrumental for further advancements.
	III YEAR II-SEMESTER
COURSE OUTCOMES	METROLOGY
C01	Students will be able to design tolerances and fits for selected product quality. They can choose appropriate method and instruments for inspection of various gear elements and thread elements. They can understand the standards of length, angles, they can understand the evaluation of surface finish and measure the parts with various comparators. The quality of the machine tool with alignment test can also be evaluated by them.
COURSE OUTCOMES	INSTRUMENTATION & CONTROL SYSTEMS
C01	After undergoing the course the student can select appropriate device for the measurement of parameters like temperature, pressure, speed, stress, humidity, flow velocity etc., and justify its use through characteristics and performance.
COURSE OUTCOMES	REFRIGERATION & AIR CONDITIONING
C01	At the end of the course the students should be able to
C02	After undergoing the course the student should be in a position to analyze various refrigerating cycles and evaluate their performance. The student also should be able to perform cooling load calculations and select the appropriate process and equipment for the required comfort and industrial air-conditioning
COURSE OUTCOMES	HEAT TRANSFER
C01	The student after undergoing this course is expected to know the principles of heat transfer and be able to apply to practical situations where in heat exchange takes place through various modes of heat transfer including phase change
COURSE OUTCOMES	ENTREPRENEURSHIP
C01	Students will gain knowledge and skills needed to run a business.
COURSE OUTCOMES	DATA BASE MANAGEMENT SYSTEM
C01	Describe a relational database and object-oriented database.
C02	Create, maintain and manipulate a relational database using SQL
C03	Understand the role and issues in management of data such as efficiency, privacy, security, ethical responsibility, and strategic advantage.

C04	Design and build database system for a given real world problem
C05	Examine issues in data storage and query processing and can formulate appropriate solutions
COURSE OUTCOMES	WASTE WATER MANAGEMENT
C01	Plan and design the sewerage systems
C02	Characterization of sewage
C03	Select the appropriate appurtenances in the sewerage systems
C04	Identify the critical point of pollution in a river for a specific amount of pollutant disposal into the river
C05	Select the suitable treatment flow for sewage treatment
COURSE OUTCOMES	HEAT TRANSFER LAB
C01	The student should be able to evaluate the amount of heat exchange for plane, cylindrical & spherical geometries and should be able to compare the performance of extended surfaces and heat exchangers
COURSE OUTCOMES	METROLOGY & INSTRUMENTATION LAB
C01	Student will become familiar with the different instruments that are available for linear, angular, roundness and roughness measurements they will be able to select and use the appropriate measuring instrument according to a specific requirement (in terms of accuracy, etc)
C02	Students will be able to select proper measuring instrument and know requirement of calibration, errors in measurement etc. They can perform accurate measurements.
COURSE OUTCOMES	COMPUTATIONAL FLUID DYNAMICS LABORATORY
C01	Solving Problems of fluid mechanics and heat transfer by writing programs in C-language and MATLAB.
C02	Using ANSYS-FLUENT build a geometry, mesh that geometry, Perform CFD method on the mesh, perform the calculation, and post-process the results
C03	Understanding the validation of the numerical result by comparison with known analytical results.
C04	Understanding the numerical result by invoking the physical principles of fluid mechanics and heat transfer
COURSE OUTCOMES	PROFESSIONAL ETHICS & HUMAN VALUES
C01	It gives a comprehensive understanding of a variety issues that are encountered by every professional in discharging professional duties.
C02	It provides the student the sensitivity and global outlook in the contemporary world to fulfill the professional obligations effectively.
	IV YEAR I-SEMESTER
COURSE OUTCOMES	MECHATRONICS
C01	After completion of this course, the student shall be able to use the various mechatronics systems devices and components in the design of electro mechanical systems.

COURSE OUTCOMES	CAD/CAM
C01	Describe the mathematical basis in the technique of representation of geometric entities including points, lines, and parametric curves, surfaces and solid, and the technique of transformation of geometric entities using transformation matrix
C02	Describe the use of GT and CAPP for the product development
C03	Identify the various elements and their activities in the Computer Integrated Manufacturing Systems.
COURSE OUTCOMES	FINITE ELEMENT METHODS
C01	Understand the concepts behind variational methods and weighted residual methods in FEM
C02	Identify the application and characteristics of FEA elements such as bars, beams, plane and isoparametric elements, and 3-D element
C03	Identify the application and characteristics of FEA elements such as bars, beams, plane and isoparametric elements, and 3-D element
C04	Able to apply Suitable boundary conditions to a global structural equation, and reduce it to a solvable form
C05	Able to identify how the finite element method expands beyond the structural domain, for problems involving dynamics, heat transfer, and fluid flow
COURSE OUTCOMES	POWER PLANT ENGINEERING
C01	After undergoing this course the student can understand various conventional methods of power generation and principle of operation and performance of respective prime movers along with their economics and their impact on environment
COURSE OUTCOMES	CONDITION MONITORING
C01	Gaining invaluable insights into the benefits of Condition Monitoring
C02	Understanding the reasons for selecting particular maintenance strategies
C03	Awareness of International Standards covering asset management
C04	Gaining practical approaches to minimize the risk of plant and machinery breakdowns
C05	Identifying the optimum maintenance strategy for different types of equipment
COURSE OUTCOMES	DESIGN FOR MANUFACTURE
C01	Design components for machining
C02	Simulate the casting design and choose the best casting process for a specific product
C03	Design components for sheet metal work by understanding in depth the sheet metal processes and their formation mechanisms
C04	Design plastic components for machining and joining and selecting a proper processes for different joining cases
COURSE OUTCOMES	CAD/CAM LAB

C01	The student will be able to appreciate the utility of the tools like ANSYS or FLUENT in solving real time problems and day to day problems
C02	Use of these tools for any engineering and real time applications
C03	Acquire knowledge on utilizing these tools for a better project in their curriculum as well as they will be prepared to handle industry problems with confidence when it matters to use these tools in their Employment
COURSE OUTCOMES	MECHATRONICS LAB
C01	Measure load, displacement and temperature using analogue and digital sensors
C02	Develop PLC programs for control of traffic lights, water level, lifts and conveyor belts
C03	Simulate and analyse PID controllers for a physical system using MATLAB.
C04	Develop pneumatic and hydraulic circuits using Automaton studio.
	IV YEAR II-SEMESTER
COURSE OUTCOMES	PRODUCTION PLANNING AND CONTROL
C01	An understanding of the concepts of production and service systems;
C02	The ability to apply principles and techniques in the design, planning and control of these systems to optimise/make best use of resources in achieving their objectives.
C03	Identify different strategies employed in manufacturing and service industries to plan production and control inventory.
C04	Measure the effectiveness, identify likely areas for improvement, develop and implement improved planning and control methods for production systems.
COURSE OUTCOMES	UNCONVENTIONAL MACHINING PROCESSES
C01	After completion of course, the student shall understand the principle of working, mechanism of metal removal in the various unconventional machining process. The student is able to identify the process parameters, their effect and applications of different processes.
COURSE OUTCOMES	AUTOMOBILE ENGINEERING
C01	The student after undergoing the course, shall visualize the layout of an automobile and its systems like transmission, steering, suspension, braking, safety etc and should know the vehicle troubleshooting
COURSE OUTCOMES	NON - DESTRUCTIVE EVALUATION
C01	Comprehensive, theory based understanding of the techniques and methods of non destructive testing
C02	Apply methods knowledge of non destructive testing to evaluate products of railways, automobiles, aircrafts, chemical industries etc.

ELECTRICAL AND ELECTRONICS ENGINEERING (R16)	
	1 Year - 1 Semester
Course Outcomes	English -1
C01	The lesson motivates the readers to develop their knowledge different fields and serve the society accordingly. Acquisition of writing skills.
C02	The lesson motivates the public to adopt road safety measures.
C03	The lesson creates an awareness in the readers that mass production is ultimately detrimental to biological survival.
C04	The lesson helps to choose a source of energy suitable for rural India.
C05	The lesson creates an awareness in the reader as to the usefulness of animals for the human society.
Course Outcomes	MATHEMATICS-I
C01	Solve linear differential equations of first, second and higher order.
C02	Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE.
C03	Calculate total derivative, Jacobian and minima of functions of two variables.
Course Outcomes	APPLIED CHEMISTRY
C01	The advantages and limitations of plastic materials and their use in design would be understood. Fuels which are used commonly and their economics, advantages and limitations are discussed. Reasons for corrosion and some methods of corrosion control would be understood. The students would be now aware of materials like nano-materials and fullerenes and their uses. Similarly liquid crystals and superconductors are understood. The importance of green synthesis is well understood and how they are different from conventional methods is also explained. Conductance phenomenon is better understood. The students are exposed to some of the alternative fuels and their advantages and limitations.
Course Outcomes	ENGINEERING MECHANICS
C01	The students are to be exposed to the concepts of force and friction, direction and its application.
C02	The students are to be exposed to application of free body diagrams. Solution to problems using graphical methods and law of triangle of forces
C03	The students are to be exposed to concepts of centre of gravity.
C04	The students are to be exposed to concepts of moment of inertia and polar moment of inertia including transfer methods and their applications.
C05	The students are to be exposed to motion in straight line and in curvilinear paths, its velocity and acceleration computation and methods of representing plane motion
Course Outcomes	COMPUTER PROGRAMMING
C01	Understand the basic terminology used in computer programming
C02	Write, compile and debug programs in C language.
C03	Use different data types in a computer program.
C04	Explain the difference between call by value and call by reference
C05	Use different data structures and create/update basic data files.
Course Outcomes	ENVIRONMENTAL STUDIES
C01	The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources
C02	The concepts of the ecosystem and its function in the environment.
C03	The need for protecting the producers and consumers in various ecosystems and their role in the

C04	Social issues both rural and urban environment and the possible means to combat the challenges
C05	About environmental assessment and the stages involved in EIA and the environmental audit.
Course Outcomes	APPLIED/ENGINEERING CHEMISTRY LABORATORY
C01	The students entering into the professional Course have practically very little exposure to lab classes. The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations; then they are exposed to a few instrumental methods of chemical analysis. Thus at the end of the lab Course, the student is exposed to different methods of chemical analysis and use of some commonly employed instruments. They thus acquire some experimental skills.
Course Outcomes	ENGLISH - COMMUNICATION SKILLS LAB- I
C01	A study of the communicative items in the laboratory will help the students become successful in the competitive world.
Course Outcomes	COMPUTER PROGRAMMING LAB
C01	Apply and practice logical ability to solve the problems.
C02	Understand C programming development environment, compiling, debugging, and linking and executing a program using the development environment
C03	Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs
C04	Understand and apply the in-built functions and customized functions for solving the problems.
	I Year - II Semester
Course Outcomes	ENGLISH -II
C01	The lesson underscores that the ultimate aim of Education is to enhance wisdom
C02	The lesson enables the students to promote peaceful co-existence and universal harmony among people and society.
C03	The lesson imparts the students to manage different cultural shocks due to globalization
C04	The theme projects society's need to re examine its traditions when they are outdated
C05	The lesson offers several inputs to protect environment for the sustainability of the future generations.
Course Outcomes	MATHEMATICS-II (Mathematical Methods)
C01	Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators.
C02	Compute interpolating polynomial for the given data.
C03	Solve ordinary differential equations numerically using Euler's and RK method.
C04	Find Fourier series and Fourier transforms for certain functions
C05	Identify/classify and solve the different types of partial differential equations
Course Outcomes	MATHEMATICS-III
C01	Determine rank, Eigenvalues and Eigen vectors of a given matrix and solve simultaneous linear equations.
C02	Solve simultaneous linear equations numerically using various matrix methods.
C03	Determine double integral over a region and triple integral over a volume.
C04	Calculate gradient of a scalar function, divergence and curl of a vector function.
Course Outcomes	APPLIED PHYSICS

C01	Construction and working details of instruments, ie., Interferometer, Diffractometer and Polarimeter are learnt. Study EM-fields and semiconductors under the concepts of Quantum mechanics paves way for their optimal utility.
Course Outcomes	ELECTRICAL CIRCUIT ANALYSIS – I
C01	Various electrical networks in presence of active and passive elements.
C02	Electrical networks with network topology concepts.
C03	Any magnetic circuit with various dot conventions.
C04	Any R, L, C network with sinusoidal excitation.
C05	Any R, L, network with variation of any one of the parameters i.e R, L, C. and f.
Course Outcomes	ENGINEERING DRAWING
C01	: Engineering drawing being the principle method of communication for engineers, the objective to introduce the students, the techniques of constructing the various types of polygons, curves and scales. The objective is also to visualize and represent the 3D objects in 2D planes with proper dimensioning, scaling etc.
Course Outcomes	ENGLISH LANGUAGE COMMUNICATION SKILLS LAB- II
C01	To enable the students to learn demonstratively the communication skills of listening, speaking, reading and writing.
Course Outcomes	APPLIED/ENGINEERING PHYSICS LAB
C01	: Training field oriented Engineering graduates to handle instruments and their design methods to improve the accuracy of measurements.
Course Outcomes	ENGINEERING WORKSHOP & IT WORKSHOP
C01	To impart hands-on practice on basic engineering trades and skills. Note: At least two exercises to be done from each trade
	II Year – ISEMESTER
Course Outcomes	ELECTRICAL CIRCUIT ANALYSIS-II
C01	Students are able to solve three- phase circuits under balanced and unbalanced condition
C02	Students are able find the transient response of electrical networks for different types of excitations.
C03	Students are able to find parameters for different types of network
C04	Students are able to realize electrical equivalent network for a given network transfer function.
C05	Students are able to extract different harmonics components from the response of a electrical network.
Course Outcomes	ELECTRICAL MACHINES – I
C01	Able to assimilate the concepts of electromechanical energy conversion.
C02	Able to mitigate the ill-effects of armature reaction and improve commutation in dc machines.
C03	Able to understand the torque production mechanism and control the speed of dc motors
C04	Able to analyze the performance of single phase transformers.
C05	Able to predetermine regulation, losses and efficiency of single phase transformers.
Course Outcomes	BASIC ELECTRONICS AND DEVICES
C01	Students are able to understand the basic concepts of semiconductor physics, which are useful to understand the operation of diodes and transistors.
C02	Students are able to explain the operation and characteristics of PN junction diode and special diodes
C03	Ability to understand operation and design aspects of rectifiers and regulators.

C04	Students are able to understand the characteristics of various transistor configurations. They become familiar with different biasing, stabilization and compensation techniques used in transistor circuits.
C05	Students are able to understand the operation and characteristics of FET, Thyristors, Power IGBTs and Power MOSFETs.
Course Outcomes	ELECTROMAGNETIC FIELDS
C01	To Determine electric fields and potentials using Gauss's law or solving Laplace's or Poisson's equations, for various electric charge distributions.
C02	To Calculate and design capacitance, energy stored in dielectrics.
C03	To Calculate the magnetic field intensity due to current, the application of Ampere's law and the Maxwell's second and third equations.
C04	To determine the magnetic forces and torque produced by currents in magnetic field
C05	To determine self and mutual inductances and the energy stored in the magnetic field.
Course Outcomes	THERMAL AND HYDRO PRIME MOVERS
C01	To make the student understand the types of prime movers, which can be connected to generators for power production and should obtain the skills of performing the necessary calculations with respect to the functioning of the prime movers
Course Outcomes	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
C01	The Learning objectives of this paper is to understand the concept and nature of Managerial Economics and its relationship with other disciplines and also to understand the Concept of Demand and Demand forecasting, Production function, Input Output relationship, Cost-Output relationship and Cost-Volume-Profit Analysis.
C02	To understand the nature of markets, Methods of Pricing in the different market structures and to know the different forms of Business organization and the concept of Business Cycles
C03	To learn different Accounting Systems, preparation of Financial Statement and uses of different tools for performance evaluation. Finally, it is also to understand the concept of Capital, Capital Budgeting and the techniques used to evaluate Capital Budgeting proposals.
Course Outcomes	THERMAL AND HYDRO LAB
C01	: To impart practical knowledge on the performance evaluation methods of various internal combustion engines, flow measuring equipment and hydraulic turbines and pumps.
Course Outcomes	ELECTRICAL CIRCUITS LAB
C01	Able to apply various theorems, determination of self and mutual inductances, two port parameters of a given electric circuits. Able to draw locus diagrams. Waveforms and phasor diagram for lagging and leading networks
	II Year – II SEMESTER
Course Outcomes	ELECTRICAL MEASUREMENTS
C01	Able to choose right type of instrument for measurement of voltage and current for ac and dc.
C02	Able to choose right type of instrument for measurement of power and energy – able to calibrate energy meter by suitable method
C03	Able to calibrate ammeter and potentiometer.
C04	Able to select suitable bridge for measurement of electrical parameters
Course Outcomes	ELECTRICAL MACHINES – II
C01	Able to explain the operation and performance of three phase induction motor.
C02	Able to analyze the torque-speed relation, performance of induction motor and induction generator.

C03	Able to explain design procedure for transformers and three phase induction motors.
C04	Implement the starting of single phase induction motors
C05	To perform winding design and predetermine the regulation of synchronous generators.
Course Outcomes	CONTROL SYSTEMS
C01	Ability to derive the transfer function of physical systems and determination of overall transfer function using block diagram algebra and signal flow graphs.
C02	Capability to determine time response specifications of second order systems and to determine error constants.
C03	Acquires the skill to analyze absolute and relative stability of LTI systems using Routh's stability criterion and the root locus method.
C04	Capable to analyze the stability of LTI systems using frequency response methods.
C05	Able to design Lag, Lead, Lag-Lead compensators to improve system performance from Bode diagrams.
Course Outcomes	POWER SYSTEMS-I
C01	Students are able to identify the different components of thermal power plants.
C02	Students are able to distinguish between AC/DC distribution systems and also estimate voltage drops of distribution systems
C03	Students are able to identify the different components of air and gas insulated substations.
C04	Students are able to identify single core and multi core cables with different insulating materials.
Course Outcomes	MANAGEMENT SCIENCE
C01	After completion of the Course the student will acquire the knowledge on management functions, global leadership and organizational behavior
C02	After completion of the Course the student will acquire the knowledge on management functions, global leadership and organizational behavior
Course Outcomes	ELECTRICAL MACHINES – I LABORATORY
C01	To determine and predetermine the performance of DC machines and Transformers
C02	To control the speed of DC motor.
C03	To achieve three phase to two phase transformation.
	III Year – I SEMESTER
Course Outcomes	POWER SYSTEMS-II
C01	Able to understand parameters of various types of transmission lines during different operating conditions.
C02	Able to understand the performance of short and medium transmission lines.
C03	Student will be able to understand travelling waves on transmission lines.
C04	Will be able to understand various factors related to charged transmission lines
C05	Will be able to understand sag/tension of transmission lines and performance of line insulators.
Course Outcomes	RENEWABLE ENERGY SOURCES
C01	Analyze solar radiation data, extraterrestrial radiation, and radiation on earth's surface
C02	Design solar thermal collectors, solar thermal plants.
C03	Design solar photo voltaic systems
C04	Develop maximum power point techniques in solar PV and wind energy systems.
C05	Explain wind energy conversion systems, wind generators, power generation.
Course Outcomes	SIGNALS & SYSTEMS

C01	Characterize the signals and systems and principles of vector spaces, Concept of orthogonality
C02	Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform.
C03	Apply sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back.
C04	Understand the relationships among the various representations of LTI systems
C05	Understand the Concepts of convolution, correlation, Energy and Power density spectrum and their relationships.
Course Outcomes	PULSE AND DIGITAL CIRCUITS OBJECTIVES
C01	Design linear and non-linear wave shaping circuits.
C02	Apply the fundamental concepts of wave shaping for various switching and signal generating circuits.
C03	Design different multivibrators and time base generators.
C04	Utilize the non sinusoidal signals in many experimental research areas
Course Outcomes	POWER ELECTRONICS
C01	Explain the characteristics of various power semiconductor devices and analyze the static and dynamic characteristics of SCR's.
C02	Design firing circuits for SCR.
C03	Explain the operation of single phase full-wave converters and analyze harmonics in the input current.
C04	Explain the operation of three phase full-wave converters.
C05	Analyze the operation of different types of DC-DC converters. Explain the operation of inverters and application of PWM techniques for voltage
Course Outcomes	ELECTRICAL MACHINES – II LABORATORY
C01	To control the speed of three phase induction motors.
C02	To determine /predetermine the performance three phase and single phase induction motors.
C03	To improve the power factor of single phase induction motor .
Course Outcomes	CONTROL SYSTEMS LAB
C01	To impart hands on experience to understand the performance of basic control system components such as magnetic amplifiers, D.C. servo motors, A.C. Servo motors, stepper motor and potentiometer.
C02	To understand time and frequency responses of control system with and without controllers and compensators.
Course Outcomes	ELECTRICAL MEASUREMENTS LABORATORY
C01	To understand the correct function of electrical parameters and calibration of voltage, current, single phase and three phase power and energy, and measurement of electrical characteristics of resistance, inductance and capacitance of a circuits through appropriate methods.
	III Year – II SEMESTER
Course Outcomes	POWER ELECTRONIC CONTROLLERS & DRIVES
C01	Explain the fundamentals of electric drive and different electric braking methods.
C02	Analyze the operation of three phase converter fed dc motors and four quadrant operations of dc motors using dual converters.
C03	Describe the converter control of dc motors in various quadrants of operation

CO4	Know the concept of speed control of induction motor by using AC voltage controllers and voltage source inverters.
Course Outcomes	POWER SYSTEM ANALYSIS
CO1	Able to draw impedance diagram for a power system network and to understand per unit quantitie
CO2	Able to form aYbusand Zbusfor a power system networks.
CO3	Able to understand the load flow solution of a power system using different methods
CO4	Able to find the fault currents for all types faults to provide data for the design of protective devices.
Course Outcomes	MICROPROCESSORS AND MICROCONTROLLERS
CO1	To be able to understand the microprocessor capability in general and explore the evaluation of microprocessors.
CO2	To be able to understand the addressing modes of microprocessors
CO3	To be able to understand the micro controller capability
CO4	To be able to program mp and mc
Course Outcomes	DATA STRUCTURES THROUGH C++
CO1	Distinguish between procedures and object oriented programming.
CO2	Apply advanced data structure strategies for exploring complex data structures. Compare and contrast various data structures and design techniques in the area of Performance.
CO3	Implement data structure algorithms through C++. Incorporate data structures into the applications such as binary search trees, AVL and B Trees
CO4	Implement data structure algorithms through C++. Incorporate data structures into the applications such as binary search trees, AVL and B Trees
Course Outcomes	UNIX AND SHELL PROGRAMMIN OPEN ELECTIVE
CO1	Documentation will demonstrate good organization and readability.
CO2	File processing projects will require data organization, problem solving and research
CO3	Scripts and programs will demonstrate simple effective user interfaces
CO4	Scripts and programs will demonstrate effective use of structured programming
Course Outcomes	POWER ELECTRONICS LAB
CO1	To study the characteristics of various power electronic devices and analyze firing circuits and commutation circuits of SCR
CO2	To analyze the performance of single-phase and three-phase full-wave bridge converters with both resistive and inductive loads.
CO3	To understand the operation of AC voltage regulator with resistive and inductive loads.
CO4	To understand the working of Buck converter, Boost converter and inverters.
Course Outcomes	MICRO MPROCESSORS AND MICRO CONTROLLERS LAB
CO1	To study programming based on 8086 microprocessor and 8051 microcontroller
CO2	To study 8086 microprocessor based ALP using arithmetic, logical and shift operations.
CO3	To study to interface 8086 with I/O and other devices.
CO4	To study parallel and serial communication using 8051& PIC 18 micro controllers.
Course Outcomes	DATASTRUCTURES THROUGH C LAB
CO1	To develop skills to design and analyze simple linear and non linear data structures
CO2	To Strengthen the ability to identify and apply the suitable data structure for the given real world problem
	IV Year – I SEMESTER

Course Outcomes	UTILIZATION OF ELECTRICAL ENERGY
C01	Able to identify a suitable motor for electric drives and industrial applications
C02	Able to identify most appropriate heating or welding techniques for suitable applications.
C03	Able to understand various level of illuminosity produced by different illuminating sources.
C04	Able to estimate the illumination levels produced by various sources and recommend the most efficient illuminating sources and should be able to design different lighting systems by taking inputs and constraints in view
Course Outcomes	LINEAR IC APPLICATIONS
C01	Design circuits using operational amplifiers for various applications.
C02	Analyze and design amplifiers and active filters using Op-amp
C03	Diagnose and trouble-shoot linear electronic circuits.
C04	Understand the gain-bandwidth concept and frequency response of the amplifier configurations
Course Outcomes	POWER SYSTEM OPERATION AND CONTROL
C01	Able to compute optimal scheduling of Generators
C02	Able to understand hydrothermal scheduling.
C03	Understand the unit commitment problem.
C04	Able to understand importance of the frequency.
C05	Understand importance of PID controllers in single area and two area systems
Course Outcomes	SWITCHGEAR AND PROTECTION
C01	Able to understand the principles of arc interruption for application to high voltage circuit breakers of air, oil, vacuum, SF6 gas type.
C02	Ability to understand the working principle and operation of different types of electromagnetic protective relays.
C03	Students acquire knowledge of faults and protective schemes for high power generator and transformers.
C04	Improves the ability to understand various types of protective schemes used for feeders and bus bar protection.
C05	Able to understand different types of static relays and their applications.
Course Outcomes	ELECTRICAL MACHINE MODELING & ANALYSIS
C01	Establish unified theory of rotating machines.
C02	To understand the concept of phase transformation.
C03	Analyze different electrical machines for improved performance through modification of their characteristics.
C04	Develop concepts on mathematical modeling of electrical machines.
Course Outcomes	ADVANCED CONTROL SYSTEMS
C01	State space representation of control system and formulation of different state models are reviewed.
C02	Able to design of control system using the pole placement technique is given after introducing the concept of controllability and observability.
C03	Able to analyse of nonlinear system using the describing function technique and phase plane analysis.
C04	Able to analyse the stability analysis using lypnov method
C05	Minimization of functionals using calculus of variation studied
Course Outcomes	ELECTRICAL SIMULATION LAB
C01	Able to simulate integrator circuit, differentiator circuit, Boost converter, Buck converter, full convertor and PWM inverter.
C02	Able to simulate transmission line by incorporating line, load and transformer models

C03	Able to perform transient analysis of RLC circuit and single machine connected to infinite bus(SMIB).
Course Outcomes	POWER SYSTEMS LAB
C01	The student is able to determine the parameters of various power system components which are frequently occur in power system studies and he can execute energy management systems functions at load dispatch center.
	IV Year - II SEMESTER
Course Outcomes	DIGITAL CONTROL SYSTEMS
C01	The students learn the advantages of discrete time control systems and the “know how” of various associated accessories.
C02	The learner understand z-transformations and their role in the mathematical analysis of different systems(like Laplace transforms in analog systems).
C03	The stability criterion for digital systems and methods adopted for testing the same are explained.
C04	Finally, the conventional and state space methods of design are also introduced
Course Outcomes	H.V.D.C. TRANSMISSION
C01	Learn different types of HVDC levels and basic concepts
C02	Know the operation of converters
C03	Acquire control concept of reactive power control and AC/DC load flow.
C04	Understand converter faults, protection and harmonic effect
C05	Design low pass and high pass filters
Course Outcomes	ELECTRICAL DISTRIBUTION SYSTEMS
C01	Able to understand various factors of distribution system.
C02	. Able to determine the voltage drop and power loss
C03	Able to design the substation and feeders
C04	Able to understand the protection and its coordination.
Course Outcomes	HIGH VOLTAGE ENGINEERING
C01	To be acquainted with the performance of high voltages with regard to different configurations of electrode systems
C02	To be able to understand theory of breakdown and withstand phenomena of all types of dielectric materials.
C03	To acquaint with the techniques of generation of AC,DC and Impulse voltages
C04	To be able to apply knowledge for measurement of high voltage and high current AC,DC and Impulse.

CIVIL ENGINEERING (R16)	
	1ST YEAR - 1ST SEMESTER
COURSE OUTCOMES	ENGLISH
CO1	The lesson motivates the readers to develop their knowledge different fields and serve the society accordingly
CO2	The lesson motivates the public to adopt road safety measures. 2. 'War' from 'Panorama : A Course on Reading'
CO3	The lesson creates an awareness in the readers that mass production is ultimately detrimental to biological survival. 2. 'The Verger' from 'Panorama : A Course on Reading'
CO4	The lesson helps to choose a source of energy suitable for rural India. 2. ' The Scarecrow' from Panorama : A Course on Reading
CO5	The lesson creates an awareness in the reader as to the usefulness of animals for the human society. 2. 'A Village Host to Nation' from Panorama : A Course on Reading
COURSE OUTCOMES	MATHEMATICS-1
CO1	Solve linear differential equations of first, second and higher order
CO2	Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE.
CO3	Calculate total derivative, Jacobian and minima of functions of two variables.
COURSE OUTCOMES	ENGINEERING CHEMISTRY
CO1	The advantages and limitations of plastic materials and their use in design would be understood. Fuels which are used commonly and their economics, advantages and limitations are discussed. Reasons for corrosion and some methods of corrosion control would be understood. The students would be now aware of materials like nano materials and fullerenes and their uses. Similarly liquid crystals and superconductors are understood. The importance of green synthesis is well understood and how they are different from conventional methods is also explained. The impurities present in raw water, problems associated with them and how to avoid them are understood. The advantages and limitations of plastic materials and their use in design would be understood. The commonly used industrial materials are introduced.
COURSE OUTCOMES	ENGINEERING MECHANICS
CO1	The students are to be exposed to the concepts of force and friction, direction and its application
CO2	The students are to be exposed to application of free body diagrams. Solution to problems using graphical methods and law of triangle of forces.
CO3	The students are to be exposed to concepts of centre of gravity
CO4	The students are to be exposed to concepts of moment of inertia and polar moment of inertia including transfer methods and their applications.
CO5	The students are to be exposed to motion in straight line and in curvilinear paths, its velocity and acceleration computation and methods of representing plane motion
COURSE OUTCOMES	COMPUTER PROGRAMMING
CO1	Understand the basic terminology used in computer programming

CO2	Write, compile and debug programs in C language.
CO3	Use different data types in a computer program.
CO4	Design programs involving decision structures, loops and functions.
CO5	Explain the difference between call by value and call by reference
COURSE OUTCOMES	ENVIRONMENTAL STUDIES
CO1	The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resource
CO2	The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity
CO3	Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices
CO4	Social issues both rural and urban environment and the possible means to combat the challenge
CO5	The environmental legislations of India and the first global initiatives towards sustainable development
COURSE OUTCOMES	ENGINEERING / APPLIED CHEMISTRY LABORATORY
CO1	The students entering into the professional course have practically very little exposure to lab classes. The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations; then they are exposed to a few instrumental methods of chemical analysis. Thus at the end of the lab course, the student is exposed to different methods of chemical analysis and use of some commonly employed instruments. They thus acquire some experimental skills
COURSE OUTCOMES	ENGLISH – COMMUNICATION SKILLS LAB -I
CO1	A study of the communicative items in the laboratory will help the students become successful in the competitive world.
	1ST YEAR - 2ND SEMESTER
COURSE OUTCOMES	ENGLISH –II
CO1	The lesson underscores that the ultimate aim of Education is to enhance wisdom. 2. 'A P J Abdul Kalam' from The Great Indian Scientists.
CO2	Abdul Kalam's simple life and service to the nation inspires the readers to follow in his footsteps.
CO3	The lesson enables the students to promote peaceful co-existence and universal harmony among people and society.
CO4	The Achievements of C V Raman are inspiring and exemplary to the readers and all scientists
CO5	The lesson imparts the students to manage different cultural shocks due to globalization. 2. 'Homi Jehangir Bhabha' from The Great Indian Scientists.
COURSE OUTCOMES	MATHEMATICS-II
CO1	. Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators.
CO2	2. Compute interpolating polynomial for the given data
CO3	. Solve ordinary differential equations numerically using Euler's and RK method
CO4	Find Fourier series and Fourier transforms for certain functions.
CO5	. Identify/classify and solve the different types of partial differential equations.

COURSE OUTCOMES	MATHEMATICS – III
CO1	Determine rank, Eigenvalues and Eigen vectors of a given matrix and solve simultaneous linear equations.
CO2	Solve simultaneous linear equations numerically using various matrix methods.
CO3	Determine double integral over a region and triple integral over a volume.
CO4	Calculate gradient of a scalar function, divergence and curl of a vector function. Determine line, surface and volume integrals. Apply Green, Stokes and Gauss divergence theorems to calculate line, surface and volume integrals.
COURSE OUTCOMES	ENGINEERING PHYSICS
CO1	Construction and working details of instruments, ie., Interferometer, Diffractometer and Polarimeter are learnt. Study Acoustics, crystallography magnetic and dielectric materials enhances the utility aspects of materials.
COURSE OUTCOMES	ELEMENTS OF MECHANICAL ENGINEERING
CO1	The stress/strain of a mechanical component subjected to loading.
CO2	The performance of components like Boiler, I.C. Engine, Compressor, Steam/Hydraulic turbine, Belt, Rope and Gear.
CO3	The type of mechanical component suitable for the required power transmission.
COURSE OUTCOMES	ENGINEERING DRAWING
CO1	Engineering drawing being the principle method of communication for engineers, the objective is to introduce the students, the techniques of constructing the various types of polygons, curves and scales. The objective is also to visualize and represent the 3D objects in 2D planes with proper dimensioning, scaling etc
CO2	The objective is to represent the object in 3D view through isometric views. The student will be able to represent and convert the isometric view to orthographic view and vice versa.
COURSE OUTCOMES	ENGLISH – COMMUNICATION SKILLS LAB – I
CO1	A study of the communicative items in the laboratory will help the students become successful in the competitive world. The course content along with the study material is divided into six units.
COURSE OUTCOMES	ENGINEERING/APPLIED PHYSICS LAB
CO1	Physics Virtual laboratory curriculum in the form of assignment ensures an engineering graduate to prepare a /technical/mini-project/ experimental report with scientific temper.
CO2	: Physics lab curriculum gives fundamental understanding of design of an instrument with targeted accuracy for physical measurements
COURSE OUTCOMES	ENGINEERING WORKSHOP & IT WORKSHOP
CO1	Common understanding of concepts, patterns of decentralization implementation in Africa
CO2	Identified opportunities for coordinated policy responses, capacity building and implementation of best practices †
CO3	Identified instruments for improved decentralization to the local level †

CO4	Identified strategies for overcoming constraints to effective decentralization and sustainable management at different level
	2ND YEAR 1ST SEMESTER
COURSE OUTCOMES	PROBABILITY AND STATISTICS
CO1	Examine, analyze, and compare various Probability distributions for both discrete and continuous random variables.
CO2	Describe and compute confidence intervals for the mean of a population.
CO3	Describe and compute confidence intervals for the proportion and the variance of a population and test the hypothesis concerning mean, proportion and variance and perform ANOVA test.
CO4	Fit a curve to the numerical data.
COURSE OUTCOMES	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
CO1	Able to analyse the various electrical networks.
CO2	Able to understand the operation of DC generators,3-point starter and conduct the Swinburne's Test.
CO3	Able to analyse the performance of transformer
CO4	Able to explain the operation of 3-phase alternator and 3-phase induction motors.
CO5	Able to analyse the operation of half wave, full wave rectifiers and OP-AMPS.
COURSE OUTCOMES	STRENGTH OF MATERIALS-I
CO1	The student will be able to understand the basic materials behavior under the influence of different external loading conditions and the support condition
CO2	The student will be able to draw the diagrams indicating the variation of the key performance features like bending moment and shear forces
CO3	The student will have knowledge of bending concepts and calculation of section modulus and for determination of stresses developed in the beams and deflections due to various loading conditions
CO4	The student will be able to assess stresses across section of the thin and thick cylinders to arrive at optimum sections to withstand the internal pressure using Lamé's equation.
COURSE OUTCOMES	BUILDING MATERIALS AND CONSTRUCTION
CO1	The student should be able to identify different building materials and their importance in building construction.
CO2	The student is expected to differentiate brick masonry, stone masonry construction and use of lime and cement in various constructions.
CO3	The student should have learnt the importance of building components and finishings.
CO4	The student is expected to know the classification of aggregates, sieve analysis and moisture content usually required in building construction.
COURSE OUTCOMES	SURVEYING
CO1	To demonstrate the basic surveying skills
CO2	To use various surveying instruments.
CO3	To perform different methods of surveying
CO4	To compute various data required for various methods of surveying.

CO5	To integrate the knowledge and produce topographical map.
COURSE OUTCOMES	FLUID MECHANICS
CO1	Understand the various properties of fluids and their influence on fluid motion and analyse a variety of problems in fluid statics and dynamics.
CO2	Calculate the forces that act on submerged planes and curves.
CO3	Identify and analyse various types of fluid flows.
CO4	Apply the integral forms of the three fundamental laws of fluid mechanics to turbulent and laminar flow through pipes and ducts in order to predict relevant pressures, velocities and forces.
CO5	Draw simple hydraulic and energy gradient lines.
CO6	Measure the quantities of fluid flowing in pipes, tanks and channels.
COURSE OUTCOMES	PROFESSIONAL ETHICS AND HUMAN VALUES
CO1	It gives a comprehensive understanding of a variety issues that are encountered by every professional in discharging professional duties.
CO2	It provides the student the sensitivity and global outlook in the contemporary world to fulfill the professional obligations effectively.
	2ND YEAR 2ND SEMESTER
COURSE OUTCOMES	BUILDING PLANNING AND DRAWING
CO1	Upon successful completion of the course:
CO2	Student should be able to plan various buildings as per the building by-laws.
CO3	The student should be able to distinguish the relation between the plan, elevation and cross section and identify the form and functions among the buildings.
CO4	The student is expected to learn the skills of drawing building elements and plan the buildings as per requirements.
COURSE OUTCOMES	STRENGTH OF MATERIALS- II
CO1	The student will be able to understand the basic concepts of Principal stresses developed in a member when it is subjected to stresses along different axes and design the sections.
CO2	The student can assess stresses in different engineering applications like shafts, springs, columns and struts subjected to different loading conditions
CO3	The student will be able to assess forces in different types of trusses used in construction.
COURSE OUTCOMES	HYDRAULICS AND HYDRAULIC MACHINERY
CO1	Solve uniform and non uniform open channel flow problems.
CO2	Apply the principals of dimensional analysis and similitude in hydraulic model testing.
CO3	Understand the working principles of various hydraulic machineries and pumps.
COURSE OUTCOMES	CONCRETE TECHNOLOGY
CO1	understand the basic concepts of concrete.
CO2	realize the importance of quality of concrete.
CO3	familiarize the basic ingredients of concrete and their role in the production of concrete and its behaviour in the field.
CO4	test the fresh concrete properties and the hardened concrete properties.

CO5	evaluate the ingredients of concrete through lab test results. design the concrete mix by BIS method.
CO6	Familiarize the basic concepts of special concrete and their production and applications. understand the behaviour of concrete in various environments.
COURSE OUTCOMES	STRUCTURAL ANALYSIS - I
CO1	Distinguish between the determinate and indeterminate structures.
CO2	Identify the behaviour of structures due to the expected loads, including the moving loads, acting on the structure.
CO3	Estimate the bending moment and shear forces in beams for different fixity conditions.
CO4	Analyze the continuous beams using various methods -, three moment method, slope deflection method, energy theorems.
CO5	Draw the influence line diagrams for various types of moving loads on beams/bridges.
CO6	Analyze the loads in Pratt and Warren trusses when loads of different types and spans are passing over the truss.
COURSE OUTCOMES	TRANSPORTATION ENGINEERING – I
CO1	Plan highway network for a given area.
CO2	Determine Highway alignment and design highway geometrics
CO3	Design Intersections and prepare traffic management plans
CO4	Judge suitability of pavement materials and design flexible and rigid pavements
CO5	Construct and maintain highways
COURSE OUTCOMES	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
CO1	The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product and the knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs.
CO2	One is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units.
CO3	The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis and to evaluate various investment project proposals with the help of capital budgeting techniques for decision making.
	III Year - I Semester
COURSE OUTCOMES	MANAGEMENT SCIENCE
CO1	After completion of the Course the student will acquire the knowledge on management functions, global leadership and organizational behavior.
CO2	Will familiarize with the concepts of functional management project management and strategic management.
COURSE OUTCOMES	ENGINEERING GEOLOGY
CO1	Identify and classify the geological minerals
CO2	Measure the rock strengths of various rocks
CO3	Classify and measure the earthquake prone areas to practice the hazard zonation
CO4	Classify, monitor and measure the Landslides and subsidence
CO5	Prepares, analyses and interpret the Engineering Geologic maps

CO6	Analyses the ground conditions through geophysical surveys.
CO7	Test the geological material and ground to check the suitability of civil engineering project construction.
CO8	Investigate the project site for mega/mini civil engineering projects.Site selection for mega engineering projects like Dams, Tunnels, disposal sites etc...
COURSE OUTCOMES	STRUCTURAL ANALYSIS – II
CO1	Differentiate Determinate and Indeterminate Structures
CO2	Carryout lateral Load analysis of structures
CO3	Analyze Cable and Suspension Bridge structures
CO4	Analyze structures using Moment Distribution, Kani's Method and Matrix methods
COURSE OUTCOMES	DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES
CO1	Work on different types of design philosophies
CO2	Carryout analysis and design of flexural members and detailing
CO3	Design structures subjected to shear, bond and torsion
CO4	Design different type of compression members and footings
COURSE OUTCOMES	TRANSPORTATION ENGINEERING – II
CO1	Design geometrics in a railway track.
CO2	Design airport geometrics and airfield pavements.
CO3	Plan, construct and maintain Docks and Harbours.
COURSE OUTCOMES	CONCRETE TECHNOLOGY LAB
CO1	Determine the consistency and fineness of cement.
CO2	Determine the setting times of cement.
CO3	Determine the specific gravity and soundness of cement.
CO4	Determine the compressive strength of cement.
CO5	Determine the workability of cement concrete by compaction factor, slump and Vee – Bee tests
CO6	Determine the specific gravity of coarse aggregate and fine aggregate by Sieve analysis.
CO7	Determine the flakiness and elongation index of aggregates.
CO8	Determine the bulking of sand.
CO9	Understand the non-destructive testing procedures on concrete.
COURSE OUTCOMES	ENGINEERING GEOLOGY LAB
CO1	Identify Mega-scopic minerals & their properties.
CO2	Identify Mega-scopic rocks & their properties.
CO3	Identify the site parameters such as contour, slope & aspect for topography.
CO4	Know the occurrence of materials using the strike & dip problems.
COURSE OUTCOMES	TRANSPORTATION ENGINEERING LAB
CO1	Ability to test aggregates and judge the suitability of materials for the road construction
CO2	Ability to test the given bitumen samples and judge their suitability for the road construction
CO3	Ability to obtain the optimum bitumen content for the mix design
CO4	Ability to determine the traffic volume, speed and parking characteristics.

	III Year - II Semester
COURSE OUTCOMES	DESIGN AND DRAWING OF STEEL STRUCTURES
CO1	Work with relevant IS codes
CO2	Carryout analysis and design of flexural members and detailing
CO3	Design compression members of different types with connection detailing
CO4	Design Plate Girder and Gantry Girder with connection detailing
CO5	Produce the drawings pertaining to different components of steel structures
COURSE OUTCOMES	GEOTECHNICAL ENGINEERING – I
CO1	The student must know the definition of the various parameters related to soil mechanics and establish their inter-relationships.
CO2	The student should be able to know the methods of determination of the various index properties of the soils and classify the soils.
CO3	The student should be able to know the importance of the different engineering properties of the soil such as compaction, permeability, consolidation and shear strength and determine them in the laboratory.
CO4	The student should be able to apply the above concepts in day-to-day civil engineering practice
COURSE OUTCOMES	ENVIRONMENTAL ENGINEERING – I
CO1	Plan and design the water and distribution networks and sewerage systems
CO2	Identify the water source and select proper intake structure
CO3	Characterisation of water
CO4	Select the appropriate appurtenances in the water supply
CO5	Selection of suitable treatment flow for raw water treatments
COURSE OUTCOMES	WATER RESOURCES ENGINEERING–I
CO1	have a thorough understanding of the theories and principles governing the hydrologic processes,
CO2	be able to quantify major hydrologic components and apply key concepts to several practical areas of engineering hydrology and related design aspects
CO3	develop Intensity-Duration-Frequency and Depth-Area Duration curves to design hydraulic structures.
CO4	be able to develop design storms and carry out frequency analysis
CO5	be able to determine storage capacity and life of reservoirs.
CO6	develop unit hydrograph and synthetic hydrograph
CO7	be able to estimate flood magnitude and carry out flood routing.
CO8	be able to determine aquifer parameters and yield of wells.
CO9	be able to model hydrologic processes
COURSE OUTCOMES	WASTE WATER MANAGEMENT
CO1	Suggest treatment methods for any industrial wastewater.
CO2	Learn the manufacturing process of various industries.
CO3	Student will be in a position to decide the need of common effluent treatment plant for the industrial area in their vicinity
COURSE OUTCOMES	GEOTECHNICAL ENGINEERING LAB
CO1	Determine index properties of soil and classify them.
CO2	Determine permeability of soils.

CO3	Determine Compaction, Consolidation and shear strength characteristics.
COURSE OUTCOMES	ENVIRONMENTAL ENGINEERING LAB
CO1	Estimation some important characteristics of water and wastewater in the laboratory
CO2	Draw some conclusion and decide whether the water is potable or not.
CO3	Decide whether the water body is polluted or not with reference to the state
CO4	parameters in the list of experiments
CO5	Estimation of the strength of the sewage in terms of BOD and COD
COURSE OUTCOMES	COMPUTER AIDED ENGINEERING LABORATORY
CO1	Understand the paper –space environment thoroughly
CO2	Develop the components using 2D and 3D wire frame models through various editing commands.
CO3	Generate assembly of various components of compound solids.
COURSE OUTCOMES	COMPUTER AIDED DRAFTING
CO1	Plan and design the sewerage systems?
CO2	Select the appropriate appurtenances in the sewerage systems?
CO3	Analyze sewage and suggest and design suitable treatment system for sewage
CO4	treatment?
CO5	Identify the critical point of pollution in a river for a specific amount of pollutant
CO6	disposal into the river?
CO7	Suggest a suitable disposal method with respect to effluent standards.
	IV Year - I Semester
COURSE OUTCOMES	ENVIRONMENTAL ENGINEERING -II
CO1	Plan and design the sewerage systems?
CO2	Select the appropriate appurtenances in the sewerage systems?
CO3	Analyze sewage and suggest and design suitable treatment system for
CO4	sewage treatment?
CO5	Identify the critical point of pollution in a river for a specific amount of
CO6	pollutant disposal into the river?
CO7	Suggest a suitable disposal method with respect to effluent standards.
COURSE OUTCOMES	WATER RESOURCES ENGINEERING–II
CO1	estimate irrigation water requirements?
CO2	design irrigation canals and canal network?
CO3	plan an irrigation system?
CO4	design irrigation canal structures?
CO5	plan and design diversion head works?
CO6	analyse stability of gravity and earth dams?
CO7	design ogee spillways and energy dissipation works?
COURSE OUTCOMES	GEOTECHNICAL ENGINEERING – II
CO1	The student must be able to understand the various types of shallow foundations and
CO2	decide on their location based on soil characteristics.
CO3	The student must be able to compute the magnitude of foundation settlement to decide

CO4	the size of the foundation.?
CO5	The student must be able to use the field test data and arrive at the bearing capacity.?
CO6	The student must be able to design Piles based on the principles of bearing capacity.?
COURSE OUTCOMES	REMOTE SENSING AND GIS APPLICATIONS
CO1	be familiar with ground, air and satellite based sensor platforms.?
CO2	interpret the aerial photographs and satellite imageries?
CO3	create and input spatial data for GIS application?
CO4	apply RS and GIS concepts in water resources engineering?
CO5	applications of various satellite data
COURSE OUTCOMES	FINITE ELEMENT METHODS
CO1	Solve simple boundary value problems using Numerical technique of Finite element method
CO2	Develop finite element formulation of one and two dimensional problems and solve them
CO3	Assemble Stiffness matrices, Apply boundary conditions and solve for the displacements
CO4	Compute Stresses and Strains and interpret the result
COURSE OUTCOMES	GROUND IMPROVEMENT TECHNIQUES
CO1	By the end of the course, the student should be able to possess the knowledge of various methods of ground improvement and their suitability to different field situations.
CO2	The student should be in a position to design a reinforced earth embankment and check its stability.
CO3	The student should know the various functions of Geosynthetics and their applications in Civil Engineering practice.
CO4	The student should be able to understand the concepts and applications of grouting.
COURSE OUTCOMES	AIR POLLUTION AND CONTROL
CO1	Decide the ambient air quality based on the analysis of air pollutants?
CO2	Design particulate and gaseous control measures for an industry?
CO3	Judge the plume behaviour in a prevailing environmental condition?
CO4	Estimate carbon credits for various day to day activities?
COURSE OUTCOMES	ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT
CO1	Prepare EMP, EIS, and EIA report
CO2	Identify the risks and impacts of a project
CO3	Selection of an appropriate EIA methodology
CO4	Evaluation the EIA report
CO5	Estimate the cost benefit ratio of a project
CO6	Know the role of stakeholder and public hearing in the preparation of EIA
COURSE OUTCOMES	IPR & PATENTS
CO1	IPR Laws and patents pave the way for innovative ideas which are instrumental for inventions to seek Patents.

CO2	Student get an insight on Copyrights, Patents and Software patents which are instrumental for further advancements
COURSE OUTCOMES	GIS & CAD LAB
CO1	work comfortably on GIS software
CO2	digitize and create thematic map and extract important features
CO3	develop digital elevation model
CO4	use structural analysis software to analyze and design 2D and 3D frames
CO5	design and analyze retaining wall and simple towers using CADD software.
COURSE OUTCOMES	IRRIGATION DESIGN AND DRAWING
CO1	At the end of the course the student will be able to To design various irrigation structures
	IV Year - II Semester
COURSE OUTCOMES	ESTIMATION SPECIFICATION & CONTRACTS
CO1	The student should be able to determine the quantities of different components of buildings.
CO2	The student should be in a position to find the cost of various building components.
CO3	The student should be capable of finalizing the value of structures
COURSE OUTCOMES	CONSTRUCTION TECHNOLOGY AND MANAGEMENT
CO1	appreciate the importance of construction planning
CO2	understand the functioning of various earth moving equipment
CO3	know the methods of production of aggregate products and concreting and usage of machinery required for the works.
CO4	apply the gained knowledge to project management and construction techniques
COURSE OUTCOMES	PRESTRESSED CONCRETE
CO1	Understand the different methods of prestressing
CO2	Estimate effective prestress including the short and long term losses
CO3	Analyze and design prestressed concrete beams under flexure and shear
CO4	Understand the relevant IS Codal provisions for prestressed concrete
COURSE OUTCOMES	SOLID AND HAZARDOUS WASTE MANAGEMENT
CO1	Design the collection systems of solid waste of a town
CO2	Design treatment of municipal solid waste and landfill
CO3	Know the criteria for selection of landfill
CO4	Characterise the solid waste and design a composting facility
CO5	Know the Method of treatment and disposal of Hazardous wastes.
COURSE OUTCOMES	PROJECT WORK
CO1	Apply all levels of Engineering knowledge in solving the Engineering problems.
CO2	Work together with team spirit.
CO3	Use Civil Engineering software at least one.
CO4	Document the projects