Course Outcomes (B-Tech)

COURSE OUTCOMES (COs)

Semester	Course Code	SUBJECT	Subject	Course Outcome
S1	**C101**	**Mathematics-1**	C101.1	Know first-order differential equation, linear differential equation and Bernoulli's equation to find solution for electrical circuits.
			C101.2	Comprehend linear differential equation of higher order, homogeneous equation with constant co-efficient, Euler - Cauchy equation and solutions by variations of parameter to model electric circuits.
			C101.3	Compute series solutions of differential equations , power series method, Lagenders polynomials and Bessel's function to solve complex engineering problems.
			C101.4	Differentiate first-order differential equation, linear differential equation and Bernoulli's equation to find solution for electrical circuits.
			C101.5	Understand linear equation and vector space.
			C101.6	Explain the asymptote and curvature problems.
	C102	**Chemistry**	C102.1	A basic idea about chemical reactions, its feasibility, rate, Effect of catalyst on reaction rate.
			C102.2	Understand the fundamental concepts on fuels as a branch of Industrial Chemistry.
			C102.3	Demonstrate the bulk properties and processes using phase Rule for different Component System.
			C102.4	Analyse an introductory idea about Corrosion and it's Sources.
			C102.5	Formulate the application of Nanomaterial in the Medical and research field
			C102.6	Review ideas about New materials and it's related areas.
	C103	**Basic Electrical Engineering**	C103.1	Know about Direct current, voltage, power, sources and analysis of electrical networks
			C103.2	Understand electromagnetism and electronics measuring instruments.
			C103.3	Apply AC fundamentals and DC transients in electrical circuits.
			C103.4	Compare rotating electrical machines and stationery electrical machine as transformer.
			C103.5	Describe about power supply systems
			C103.6	Relates the industrial applications of Electrical energy
	C104	**Basic Mechanical Engineering**	C104.1	Use thermodynamics basics & terminolgy correctly.
			C104.2	Demonstrate the principles of thermal engineering in power producing fields
			C104.3	Explain the working of various power transmission devices .
			C104.4	Understand the basic components of robots, differentiate types of robots and robot grippers.
			C104.5	Working of various instruments used for measuring temperature and pressure.

			C104.6	Working of various instruments used for measuring for flow, speed, stress, strain.
	C105	**Communicative English**	C105.1	Outlines various elements and concepts related to communicative English.
			C105.2	Distinguishes between EIE and RP in English Language.
			C105.3	Prepares for effective workplace communication.
			C105.4	Illustrates the significance of professional writing.
			C105.5	Appraises the students of the nuances of soft skills.
			C105.6	Explains the importance of Emotional Intelligence
	C106	**Chemistry Lab**	C106.1	Define Titration through standardization of KMnO4
			C106.2	Illustrate the procedure of determination of Flash point, Fire point, Viscosity of lubricating oil.
			C106.3	Estimate the amount of Fe2+, Ca2+, Total Hardness, Percentage of available Chlorine in a given sample.
			C106.4	Evaluate Hardness of water by Titration Method
			C106.5	Formulate Dissolved Oxygen level in a sample of water.
			C106.6	Validate the amount of individual alkali present in a mixture and
	C107	**Basic Electrical Engineering Lab**	C107.1	How to measure the electrical consumption of various devices as well as for DC compound machines.
			C107.2	Distinguish operate and control the speed of DC shunt motor, Three phase induction motor.
			C107.3	Show the characteristics and use of Incandescent lamps and fuses.
			C107.4	Analyze the open circuit characteristics of DC shunt generators
			C107.5	Evaluate current, voltage and power in AC electric circuits
			C107.6	Study of House wiring.
	C108	**Basic Mechanical Engineering Lab**	C108.1	Understand main parts & working of Steam power plant,IC Engine & refrigerator
			C108.2	Identify the different parts of the automobile
			C108.3	Determine velocity ratio of belt drive.
			C108.4	Analyse of Gears and Gear trains
			C108.5	Verify Bernoulli's Theorem & its application .
			C108.6	Calibration of Bourdon Tube Pressure gauge
	C109	**Engineering Graphics & Design Lab**	C109.1	Gather knowledge about the tools and tackels used for drawing.
			C109.2	Explain how to draw projection of points and lines.
			C109.3	Show projection of planes and solids.
			C109.4	Construct the cut section and development of points.
			C109.5	Describe isometric view and can able to draw in AUTO CAD.
			C109.6	Prepare the model using CAD software.
	C110	**English Language Lab**	C110.1	understand the importance of clarity,precision,conciseness and coherence in one's use of language both oral and written.
			C110.2	communicate fluently and accurately with four skills:- Speaking,Listening,Writing & Reading.
			C110.3	confident in verbal and nonverbal communication by means of practice
			C110.4	create a lively and familiar communicative learning environment in the workplace.
			C110.5	use the dictionary skills to find the correct pronunciation of words and perform various phonemic transcriptions.

			C110.6	Apply the acquired competencies to practices (LSRW)
S2	**C111**	**Mathematics-II**	C111.1	Know Laplace Transform to get the solution to differential equation, convolution and Integral equation.
			C111.2	Interpret the concepts of Fourier series, Fourier transform, Fourier Integral
			C111.3	Solve beta function and error function to get solutions of complex real life problem.
			C111.4	Compare the scalar and vector problems.
			C111.5	Evaluate line integral and double integration problems
			C111.6	Know the techniques of combinethe problems using Gauss divergence and Stoke's theorem
	C112	**Engineering Mechanics**	C112.1	Understand the fundamentals of Mechanics & compute the equilibrium of rigid bodies.
			C112.2	Learn the concept of parallel forces, moment, Couple & effect of friction on equilibrium.
			C112.3	Locate the Centroid & determine the area/mass moment of inertia of different shapes.
			C112.4	Understand the concept of virtual work and determine the forces in members of trusses
			C112.5	Learn kinematics, kinetics of particle and rigid body, related principles
			C112.6	Solves the numerical on the projectile, D-Alembert's principle and analyze impact of elastic bodies on collision.
	C113	**Physics**	C113.1	Define the concepts of quantum mechanics.
			C113.2	Understand the basic features of different oscillatory systems, waves and related properties and properties of different types of solids.
			C113.3	Apply vector calculus in electromagnetic waves.
			C113.4	Analyse the application of quantum mechanics to various physical problems.
			C113.5	Compare interference and diffraction.
			C113.6	Justify the applications of LASER and Optical fibre in various fields.
	C114	**Basics Electronics Engineering**	C114.1	A basic knowledge of Semiconductor.
			C114.2	Understand the use of diodes as power supply rectifiers.
			C114.3	Apply the basic operation of OP-AMP circuit.
			C114.4	Analyse functional details and operation of transistors as switching circuits.
			C114.5	Illustrate the main elements of a communication system, and the principles related to its operation.
			C114.6	Summarize the principle and working of different logic gates and the related instruments.
	C115	**Basics Civil Engineering**	C115.1	Know about the Composition and resolution of forces and equilibrium of concurrent coplanar force
			C115.2	Distinguish the centroids of composite plane figure and curves,
			C115.3	Apply the Principles of Dynamics
			C115.4	Differentiate Momentum and impulse
			C115.5	Explain Brick as a construction material and its importance, qualities of a good brick
			C115.6	Categorize planning and design aspects of transportation engineering, different modes of transport
	C116		C116.1	Know about the different parts of computer and binary representation of numbers along with their operations

		Programming & Problem Solving Using "C"	C116.2	Understand the structured programming processes and operating systems.
			C116.3	Use and handle the C language fundamentals
			C116.4	Differentiate between different programmes like monolithic and modular etc
			C116.5	Apply the different C functions
			C116.6	Summarize about the pointers and file handling
	C117	**Physics Lab**	C117.1	Define acceleration due to gravity, different moduli of elasticity & surface tension.
			C117.2	Explain the phenomena like interference and diffraction in Newton's rings and for a plane diffraction grating.
			C117.3	Estimate the value of acceleration due to gravity and moduli of elasticity of different materials.
			C117.4	Differentiate the characteristic curve of PN diode and Bipolar junction transistor & charge and discharge time of a condenser connected in RC circuit.
			C117.5	Propose different frequencies for resonance for the vibrations in a stretched string using tuning forks.
			C117.6	Justify a project work on topics having different branches of physics.
	C118	**Basic Electronics Engineering Lab**	C118.1	Know all active and passive components such as diode, transistors of an electronic circuits
			C118.2	Understand the main elements of a communication system, and the principles related to its operation
			C118.3	Handle all measuring instruments such as CRO, multi meter and use them for any practical necessities.
			C118.4	Record and analyze the output of different developed circuits
			C118.5	Design different circuits using OPAMP, Diode and Transistors.
			C118.6	Study and realization pf logic gates.
	C119	**Basic Civil Engineering Lab**	C119.1	Know Polygon Law of Coplanar Forces
			C119.2	Understand Support Reactions of a beam
			C119.3	Handle Experiment on trusses to calculate the force in the member of a simple truss
			C119.4	Record Friction experiment on inclined plane for determining coefficient of friction
			C119.5	Design Moment of inertia of fly wheel
			C119.6	Determine Compressive strength of concrete
	C120	**Workshop**	C120.1	Know about various tools and tackles used in workshop.
			C120.2	Understand the procedure to prepare fitting job.
			C120.3	Conduct different machining operations on lathe machine
			C120.4	Analyse the types of joints prepared in welding.
			C120.5	Describe shaper, milling and drilling machine.
			C120.6	Differentiate types of welding and machining process.
	C121	**Programming & Problem Solving Using "C" LAB**	C121.1	Write C codes on standard computing devices using conditional, branching and iterative constructs.
			C121.2	To understand modularization concept and write efficient and manageable code using functions
			C121.3	To model real life multi dimensional problems by using multi dimensional structures of C.
			C121.4	To manage various memory fragmentation problems by using dynamic memory concepts.
			C121.5	To implement I/O concepts and file handling concepts for managing the data and storing it in non-volatile mediums.

			C121.6	Implementation of Bubble, Insertion and Selection.
S3	**C201**	**Mathematic-III**	C201.1	Understand the concepts of Analytic functions, Complex integrations and Cauchy-Riemann equations.
			C201.2	Evaluate real integrals and learn residue integration method.
			C201.3	Explain the errors of numerical results and different types of interpolations.
			C201.4	Implement different Numerical Integration methods and find solution to ordinary differential equations.
			C201.5	Analyse Random variables and different Probability Distributions.
			C201.6	Apply Correlation analysis, Regression Analysis and Statistical hypothesis.
	C202	**Object oriented Programming using java**	C202.1	Describe the important concepts of object oriented programming like object and class, Encapsulation, inheritance and polymorphism.
			C202.2	Write the skeleton of Java program.
			C202.3	Write the simple Java programs using the variables, operators, control structures, functions and I/O objects cin and cout.
			C202.4	Write the simple object oriented programs in Java using objects and classes.
			C202.5	Use features of Java like type conversion, inheritance, polymorphism, I/O streams and files to develop programs for real life problems.
			C202.6	Use advance features like temples and exception to make programs supporting reusability and sophistication.
	C203	**Engineering Economics**	C203.1	Define the basic concept of micro and macro economics,engineering economics and their application in engineering economy.
			C203.2	Evaluate numerically the effects of changes in demand and supply on price determination of products and services.
			C203.3	Analyze the macroeconomic environment and financial systems of the country and its impact on buisness ,society and enterprise.
			C203.4	Develop the ability to account for time value of money using engineering economy factors and formulas.
			C203.5	Discuss banking structures and various financial systems.
			C203.6	Calculate the depreciation using different methods like Straight line method, Declining balance method.
	C204	**Digital Logic Design**	C204.1	Define the combinational and sequential circuit operation.
			C204.2	Explain a counter having a specified count sequence using state diagrams and state table
			C204.3	Apply the HDL for all digital circuits.
			C204.4	Analyse the layout of various digital circuit.
			C204.5	Design digital circuits, use standard laboratory instrumentation to verify the operation of the circuits, and use PC-based electronic circuit simulation software.
			C204.6	Validate combinational logic circuits using programmable logic devices.
	C205	**Data Structure**	C205.1	Identify and implement asymptotic notations of an algorithm to analyse the consumption of resources (time/space).
			C205.2	Discuss the concept of linear data structure and their sequential representation in programming.

			C205.3	Demonstrate linear data structure and their linked representation in terms of programming.
			C205.4	Analyse various searching and sorting techniques such as linear search, binary search, bubble sort, insertion sort, quick sort and heap sort using C programming.
			C205.5	Evaluate and compare tree traversal techniques.
			C205.6	Design a real life application through linear data structure using dynamic memory allocation.
	C206	**Digital Logic Design Lab**	C206.1	State the truth table of basic gates, universal gates and exclusive gates.
			C206.2	Explain the various Boolean Expression using universal gates.
			C206.3	Demonstrate various sequential circuit operations like latch and flip-flop.
			C206.4	Analyse VHDL code for various combinational and sequential circuit.
			C206.5	Design and test various combinational Circuits using Gates.
			C206.6	Justify various Registers using flipflop.
	C207	**Data Structure Lab**	C207.1	Identify and implement asymptotic notations of an algorithm to analyze the consumption of resources (time/space).
			C207.2	Discuss the concept of linear data structure and their sequential represenatation in programming.
			C207.3	Demonstrate linear data structure and their linked represntation in terms of progarmming.
			C207.4	Analyze various searching and sorting techniques such as linear search, binary search,bubble sort,insertion sort,quick sort and heap sort using C programming.
			C207.5	Evaluate and compare tree traversal techniques.
			C207.6	Design a real life appliaction through linear data structure using dynamic memory allocation
	C208	**OOPS Using Java Lab**	C208.1	Define object oriented features, such as abstraction, inheritance, polymorphism for writing an effective program.
			C208.2	Explain different looping constructs for efficient programming.
			C208.3	Perform class and object concepts for the construction of programming.
			C208.4	Illustrate inheritance concepts for reusability of the code.
			C208.5	Implement exception handling to write robust programs.
			C208.6	Design web based applications using applets.
	C209	**Evaluation of Internship-I**	C209.1	To Understand the backend of a company website including posts, media and calendar
			C209.2	Learn how to execute common administrative tasks as they pertain to maintaining the cybersecurity of an organization
			C209.3	How to participate in and organize a major event and understand what alternatives are available
			C209.4	How to Pick a recurrent problem and develop a sustainable solution (i.e., pest management, waste removal, etc.)
			C209.5	strong understanding of marketing and public relations strategies to help positively promote the host company to the public and to clients
			C209.6	Design a real life application through linear data structure using dynamic memory allocation.
S4	**C210**	**Discrete Mathematics**	C210.1	Outline Sets and their algebra,duality,power sets and partitions,Principle of Strong Mathematical Induction and Product sets.

			C210.2	Explain Solving problems using Recurrence Relations,Pigeon-HolePrinciple and Invertible Functions.
			C210.3	Solve various numeric and generating functions.
			C210.4	Analyse solution of recurrence relations by the method of generatin gfunctions,divide and conquer algorithms
			C210.5	Evaluate problems using groups, Rings and Boolean Algebra (Lattice,Principle of duality etc.)
			C210.6	Design graphs and trees to formulate solutions for real life problems..
	C211	**Design and Analysis of Algorithms**	C211.1	Define the various algorithm analysis methods and the asymptotic time complexities of various statements with its correctness
			C211.2	Explain important algorithmic design paradigms (divide-and-conquer, greedy method, dynamic-programming and Backtracking) and apply when an algorithmic design situation calls for it.
			C211.3	Demonstrate the major graph algorithms and Employ graphs to model engineering problems, when appropriate.
			C211.4	Apply different data structures for problem solving and pick an appropriate data structure for a design situation.
			C211.5	Compare the classes P, NP, and NP Complete and be able to prove that a certain problem is NP-Complete.
			C211.6	Familiarizing students with specific algorithms for a number of important computational problems design and development.
	C212	**Organisational Behaviour**	C212.1	Outline the development of the field of organizational behaviour and explain the micro and macro approaches.
			C212.2	Explain different models used to explain individual behaviour related to motivation and rewards.
			C212.3	Demonstrate skills required for working in groups (team building).
			C212.4	Analyze the various leadership styles and the role of leaders in a decision making process.
			C212.5	Compare organizational cultures and describe its dimensions and to examine various organizational designs.
			C212.6	Compose the implementation of organizational change.
	C213	**Computer Organization and Architecture**	C213.1	Recall the basic structure and operational concepts of computer.
			C213.2	Summarize the execution of machine instructions and design of the arithmetic and logic unit.
			C213.3	Solve arithmetic and logical operation using different techniques.
			C213.4	Classify different types of memory such as main memory, cache memory, secondary memory and virtual memory.
			C213.5	Compare different types of microprocessors and Assembly Language Programming.
			C213.6	Design a logical diagram for a specified RAM
	C214	**Data Communication**	C214.1	Define modern network architectures from a design and performance perspective.
			C214.2	Describe the basics and challenges of network communication.
			C214.3	Implement network programming using TCP/IP.
			C214.4	Analyze the operation of the protocols that are used inside the Internet.

			C214.5	Evaluate various types of transmission media with real time applications
			C214.6	Investigation on Application layer and Presentation layer paradigms and protocols.
	C215	**Analog Electronic Circuits**	C215.1	Define semiconductor device and different operating condition and their performance parameter.
			C215.2	To understand of small signal amplifier design using linear transistor models.
			C215.3	Illustrate working principle of different electronic circuit and their application in real life.
			C215.4	Analyze the performance parameter of the system.
			C215.5	Employ mathematical and graphical analysis considering different practical issues modeling of semiconductor device.
			C215.6	Recognize different signal processing circuit and the use in industrial, real life, modern control system application.
	C216	**Problem Solving and Python Programming Laboratory**	C216.1	Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
			C216.2	Express proficiency in the handling of strings and functions.
			C216.3	Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.
			C216.4	Identify the commonly used operations involving file systems and regular expressions.
			C216.5	Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python.
			C216.6	To develop the ability to write database applications in Python
	C217	**Design and Analysis of Algorithms Lab**	C217.1	Analyse and compare running times of algorithms using asymptotic analysis.
			C217.2	To demonstrate understanding of algorithmic design paradigms such as divide-and-conquer, dynamic-programming, greedy, backtracking etc
			C217.3	Apply the algorithms design techniques to solve greedy problem .
			C217.4	Ability to analyze and implement shortest path problem.
			C217.5	Demonstrate the efficiency of algorithms using polynomial problem.
			C217.6	Implement minimum spanning tree and analyze time complexity
	C218	**Computer Organization and Architecture Lab**	C218.1	Identifying the various components of PC.
			C218.2	Discuss about the different troubleshooting of a dot matrix printer using LX 1050+ Printer Trainer Module
			C218.3	Demonstrate the functions of SMPS using SMPS Trainer Kit
			C218.4	Illustrate different troubleshooting of CPU using CPU Trainer Module.
			C218.5	Compare the assembly language program of 8085 and 8086 architecture.
			C218.6	Design of digital circuits (H/A, F/A, Decoder & Encoder) in VHDL using Active VHDL.
S5	**C301**	**Formal Languages and**	C301.1	Define the knowledge of basic kinds of finite automata and their capabilities. (Knowledge)

		Automata Theory	C301.2	Illustrate mathematical proofs for computation and algorithms.
			C301.3	Describe regular and Context-free Language with model.
			C301.4	Analyze key notions, such as algorithm, computability, P,NP,NPC,decidability, and complexity through problem solving.
			C301.5	Evaluate the relevance of the Church-Turing thesis.
			C301.6	Design finite automata, push down automata, Turing machines, formal languages & grammars.
	C302	**Database Management Systems**	C302.1	Outline the basic concepts of data base systems and identify different data base architecture schemas, data models.
			C302.2	Interpret the components of E R model and describe the storage architecture.
			C302.3	Demonstrate relational algebra, relational calculus and apply them in database design.
			C302.4	Analyse and illustrate the different normal forms and classify their utility in data base design.
			C302.5	Determine the properties of transaction processing, concurrency control and time stamp methods.
			C302.6	Design and create relational database from different case studies and formulate the uses of distributed database, parallel database, data ware housing, data mining & Bigdata.
	C303	**Operating Systems**	C303.1	Define Operating system, process, critical section, semaphore, monitor, thread,deadlock, virtual memory, file, protection and security.
			C303.2	Explain Operating system functions and services, process control block and process cycle, Describe characteristics for deadlock handling strategies, paging, segmentation,different file systems.
			C303.3	Solve problems on CPU scheduling, dead lock avoidance, paging and disk scheduling.
			C303.4	Analyse different operating system structures and different CPU scheduling algorithms, file structures.
			C303.5	Compare paging and segmentation, page replacement algorithms, disk scheduling mechanisms.
			C303.6	Prepare a list of functionality requirement specification of an operating system for a real world scenario.
	C304	**Advance Computer Architecture**	C304.1	Define microprocessor, microcontroller, pipelining and interconnection network.
			C304.2	Describe the various stages of pipelining and different interconnection network mechanisms.
			C304.3	Demonstrate the performance enhancements by using concepts of pipelines, dynamic scheduling, branch prediction, caches, and vector processors.
			C304.4	Analyse modern architectures such as Super Scalar, VLIW (very large instruction word), multi-core and multi-CPU systems.
			C204.5	Evaluate the effectiveness of different mapping techniques for cache and page replacement algorithms or reducing page faults.
			C204.6	Design a hypothetical message passing system using any suitable interconnection structure.
	C305	**Computer Graphics**	C305.1	Define different line drawing and circle drawing algorithms.
			C305.2	Discuss basic transformations between coordinate systems.

			C305.3	Determine various computer graphics tools and techniques.
			C305.4	Categorize between different projection systems.
			C305.5	Evaluate various algorithms of 2D and 3D transformations on different types of objects.
			C305.6	Create interactive computer graphics using different annotations.
	C306	**Formal Languages and Automata Theory Lab**	C306.1	Understand the abstract model of finite automaton.
			C306.2	Implement the conversions of finite automaton.
			C306.3	Design the abstract model of Push Down Automaton
			C306.4	Evaluate the parsing algorithm for some specific context free grammars.
			C306.5	Analyze abstract model of Turing Machine and the power to recognize the language.
			C306.6	Explain the application of machine models.
	C307	**Database Management Systems Lab**	C307.1	Define data model and Schemas in RDBMS.
			C307.2	Describe SQL, DDL, DML and DCL SQL statements to perform different operations.
			C307.3	Apply DDL, DML statements on a Problem domain
			C307.4	Classify different DML statements like Aggregate function, Joins, Nested Queries
			C307.5	Determine the uses of procedures, cursors, sub programs etc in PL/SQL.
			C307.6	Design and Create a complete Database and develop different DML statements for execution.
	C308	**Operating Systems Lab**	C308.1	Remember and use of various Linux commands and UNIX system calls.
			C308.2	Interpret the commands using different parameters.
			C308.3	Demonstrate the submission of small problems using shell programming and implement various OS algorithms.
			C308.4	Analyse the shared memory and message queue communication among processes.
			C308.5	Evaluate their performance of different page replacement algorithms with respect to page fault through simulation.
			C308.6	Build one program to check whether there will be deadlock or not for any given real-world problem.
	C309	**Evaluation of Summer Internship-II**	C309.1	To Understand the backend of a company website including posts, media and calendar
			C309.2	Learn how to execute common administrative tasks as they pertain to maintaining the cybersecurity of an organization
			C309.3	How to participate in and organize a major event and understand what alternatives are available
			C309.4	How to Pick a recurrent problem and develop a sustainable solution (i.e., pest management, waste removal, etc.)
			C3.9.5	strong understanding of marketing and public relations strategies to help positively promote the host company to the public and to clients
			C309.6	Design a real life application through linear data structure using dynamic memory allocation.
S6	**C310**	**Software Engineering**	C310.1	Identify the requirement of software engineering in designing, development, testing and deployment of a real-life software project.
			C310.2	Understand software life cycle model for systematic development of a project.

			C310.3	Ability to develop, maintain, efficient, reliable and cost-effective software solutions.
			C310.4	Illustrate to identify the minimum requirements for the development of application.
			C310.5	Select different software testing approaches such as unit testing and integration testing.
			C310.6	Design a prototype of a software application using SDLC concept.
	C311	**Compiler Design**	C311.1	Define various phases of compiler, code optimization techniques and machine code generation.
			C311.2	Classify top down & bottom-up parsing.
			C311.3	Demonstrate DAG for intermediate code generation.
			C311.4	Analyze the knowledge of parser by parsing LL parser and LR parser.
			C311.5	Implementing code optimization by removing redundant and unreachable codes.
			C311.6	Analyze & Design Run time environments and Syntax directed translations.
	C312	**Optimization in Engineering**	C312.1	Apply basic concepts of mathematics to formulate an optimization problem.
			C312.2	Analyze and appreciate variety of performance measures for various optimization problems.
			C312.3	To understand importance of optimization in different sectors.
			C312.4	To understand the theory of optimization methods and algorithms developed for solving various types of optimization problems.
			C312.5	To develop and promote research interest in applying optimization techniques in problems of Engineering and Technology.
			C312.6	To apply the mathematical results and numerical techniques of optimization theory to concrete Engineering problems.
	C313	**Cloud Computing**	C313.1	Ability to develop the fundamentals of cloud computing
			C313.2	Ability to understand architecture of cloud.
			C313.3	Ability to comprehend, design, and develop cloud system using some state-of-the-art platform.
			C313.4	Explain how QoS technologies are used to provide "data pipes" between data centers.
			C313.5	Explain major security and privacy problems in the cloud and how they are addressed with the security mechanisms.
			C313.6	Describe the architecture of the modern data center and the mechanisms of service orchestration.
	C314	**Numerical Methods**	C314.1	Knowledge of error and it's used in different Numerical method and explore the knowledge for solving any type of one variable equation by Numerical technique.
			C314.2	Knowledge of matrix and linear algebraic equations and technique for solving it by Numerical method.
			C314.3	Students can know about Interpolation and derive it from a tabular data.
			C314.4	Students can solve any type of definite integral with a suitable error.
			C314.5	Knowledge of differential equations and technique of getting solution of IVP by numerical method.

			C314.6	Students can differentiate IVP & BVP and method for solving a BVP problem by Numerical method.
	C315	**Software Engineering Lab**	C315.1	Outline the SRS for different functional and non-functional requirements.
			C315.2	Understand the software engineering methodologies involved in the phases for software development
			C315.3	Solve the DFD of various models.
			C315.4	Ability to develop product start-up and implementing software process models in software engineering methods
			C315.5	Select the various testing tools for software mechanisms.
			C315.6	Build project management tool like MS Project or Gantt Project.
	C316	**Compiler Design Lab**	C316.1	Understand the working of lex and Yacc compiler for debugging of programs.
			C316.2	Understand and define the role of lexical analyzer, use of regular expression and transition diagrams.
			C316.3	Understand and use Context free grammar, and parse tree construction.
			C316.4	Learn & use the new tools and technologies used for designing a compiler.
			C316.5	Develop program for solving parser problems.
			C316.6	Learn how to write programs that execute faster
	C317	**Future Ready Contributor Develop Model Lab**	C317.1	Improve the employability of students by giving them the right work ethic and thinking that employers are looking for.
			C317.2	Improve their ability to engage better in the workplace and to be able to handle the challenges that come up there.
			C317.3	Widen their choices of career and success, so that they are able to open up more opportunities for themselves and take up unconventional career pathways.
			C317.4	Build their confidence with which they can go into any job and contribute meaningfully.
			C317.5	Enable them recognize how they as technical professionals, can participate and make a positive contribution to their communities and to their state.
			C317.6	Build their career-worthiness and help them develop into future-ready contributors with ability to navigate a career in a volatile, changing world.
	C318	**Seminar-I**	C318.1	Select topics on modern technology; prepare slides for PowerPoint presentations.
			C318.2	Able to gain deep knowledge of modern technology by referring the journals and magazines
			C318.3	Present before a huge audience or any topic without fear and with voice clarity, good gate-up, and proper body language
			C318.4	Write a detailed report on any topic related to modern technology in the prescribed format.
			C318.5	Able to attend or deliver any national or international seminar.
S7	**C401**	**Entrepreneurship Development**	C401.1	Identify qualities of entrepreneurs.
			C401.2	To Introduce various qualities required for entrepreneurship
			C401.3	To Write project proposal
			C401.4	Use various entrepreneurship models
			C401.5	Understand various schemes supporting entrepreneurship
			C401.6	Able to Think creative and innovative

	C402	**Internet of Things**	C402.1	Identify the IoT networking components with respect to OSI layer.
			C402.2	Summarize schematic for IoT solutions
			C402.3	Demonstrate and develop IoT based smart environment.
			C402.4	Illustrate the IoT protocols and software.
			C402.4	Justify cloud computing for developing IOT based application.
			C402.6	Develop a real time system prototype by using aurdino or nodeMCU.
	C403	**Software Project Management**	C403.1	Define roles and responsibilities by software project management process group.
			C403.2	Describe the purpose and benefits of project management.
			C403.3	Illustrate reports and oral presentations.
			C403.4	Analyze a project and implement a solution by working in groups.
			C403.5	Evaluate quality management and process improvement in the context of software development projects.
			C403.6	Design and formulate risk management techniques of IS projects.
	C404	**Renewable Power Generation Systems**	C404.1	An ability to apply knowledge of mathematics, science, engineering and economics.
			C404.2	To understand to design a system, component, or process to meet desired needs within realistic.
			C404.3	Illustrate an ability to identify, formulate, and solve engineering problems.
			C404.4	To implement to use the techniques, and modern engineering tools necessary for engineering practice.
			C404.5	To learn how to Calculate the major parameters of sun movement, solar radiation, and tracking systems.
			C404.6	Understand concepts of geothermal and marine power systems and their implementation.
	C405	**Green Technology**	C405.1	Enlist different concepts of green technologies in a project
			C405.2	Understand the principles of Energy efficient technologies
			C405.3	Estimate the carbon credits of various activities
			C405.4	Identify the importance of life cycle assessment
			C405.5	Recognize the benefits of green fuels with respect to sustainable development.
			C405.6	To impart knowledge on the methods of reducing CO2 levels in atmosphere.
	C406	**Disaster Management**	C406.1	To introduce concept of disaster and risk
			C406.2	To understand disaster management mechanism.
			C406.3	To have knowledge of capacity building concept and legislative support.
			C406.4	To understand the copying strategies with disaster.
			C406.5	To use the safety plan, safety norms and survival kits during disaster.
			C406.6	Students will be able to understand the strategies for disaster management planning.
	C407	**Minor Project**	C407.1	Identify & undertake projects that are feasible, cost-effective, eco-friendly, and safe.
			C407.2	Measure the project's relation to the literature and how much the project applies to society.
			C407.3	Plan properly to finish the project within the scheduled time.

			C407.4	Conduct all relevant testing after the project is completed and then review the test results for future research.
			C407.5	Execute any project with proper methodology and in a team spirit.
			C407.6	Write the thesis/project report as per standard norm.
	C408	**Seminar-II**	C408.1	Present the latest technologies and recent advancements in the technical field, along with sufficient data and information among his or her peers.
			C408.2	Identify grey areas of his/her interpersonal skills by critical evaluation of presentation techniques and further
			C408.3	Communicate effectively verbally and/or non-verbally for knowledge enhancement and better interpersonal skills.
			C408.4	Use the internet, books, resource persons, and the library effectively to retrieve the required information.
			C408.5	Cite the references of the originating sources of concepts, data, and information.
	C409	**Comprehensive Viva**	C409.1	Demonstrate the understanding of engineering knowledge learnt in four year graduation course.
			C409.2	Defend any type of interviews, viva-voce, and aptitude tests both at the academic and the industry sector.
			C409.3	Perform well in group discussions and enhance the communications skills and interaction
			C409.4	Apply knowledge in developing their career in particular fields.
			C409.5	Apply the principles and phenomena, and their applications in solving engineering problems
S8	**C410**	**Major Project / Internship**	C410.1	Define a problem and review the literature to identify the gaps, objectives, & scope of the work in the project team in advanced areas of mechanical engineering.
			C410.2	Analyze the problems of Computer Science and engineering to formulate the objectives of the project.
			C410.3	Design a system, component, or process to meet the desired needs within certain realistic constraints such as economic, environmental, social, safety, manufacturability, and sustainability.
			C410.4	Demonstrate the techniques, skills, and modern engineering tools necessary for engineering practice.
			C410.5	Apply knowledge to solve engineering problems in multidisciplinary functional teams to communicate effectively and ethically.
			C410.6	Prepare a professional report as per recommended format and defend the work.

Course Outcomes

COUSE OUTCOMES (Cos)