Program Outcomes

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

2. Problem analysis: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

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

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

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

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

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

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

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

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

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

Course Outcomes

2015 Pattern

F.E Computer Engineering

106: Course Name: C110003 **- Fundamentals Programming Languages-I**

On the completion of the course, learner will be able to

C106.1	Explain the working of different components of computer system.
C106.2	Apply knowledge of C programming to solve different problems.
C106.3	Make Use of control structure & pointers for solving the problem.
C106.4	Develop program with array, function and string.

113: Course Name: C110010 **- Fundamentals Programming Languages-II**

On the completion of the course, learner will be able to

C113.1	Make Use of various user defined data types in C Language.
C113.2	Explain concepts of object oriented programming to solve problems.
C113.3	Develop web pages using HTML.
C113.4	Utilize Android & Embedded C Programming concepts to develop an application.

S.E Computer Engineering

201: Course Name: 210241-**Discrete Mathematic**

On the completion of the course, learner will be able to

C201.1	Explain and apply Set theory, Logic, Relation and Function to solve problems.
C201.2	Calculate number of possible outcomes of elementary combinatorial processes.
C201.3	Analyze mathematical data structures, Tree and Graph to solve problems.
C201.4	Explain and solve problems on algebraic structure and coding theory using mathematical methods.

202: Course Name: 210242- **Digital Electronics and Logic Design**

On the completion of the course, learner will be able to

C202.1	Relate and Compare the functionality of Combinational and Sequential Circuits.
C202.2	Define the concept of ASM charts and Analyze the digital circuits using VHDL
C202.3	Apply and compare the functionalities, applicability of Logic Families and Programmable logic devices.
C202.4	Illustrate concepts of Microcontroller 8051 and Programming Model.

203: Course Name: 210243- **Data Structures and Algorithms**

On the completion of the course, learner will be able to

C203.1	Relate and Solve time complexities of various algorithms and recurrence relations.
C203.2	Solve problems using sequential, linked list and GLL Concepts of data structure.
C203.3	Develop algorithms using the concepts of data structure such as stack and queue.
C203.4	Compare and Make use of different searching and sorting technique based on space and time complexity of the algorithm.

204: Course Name: 210244 - **Computer Organization and Architecture**

On the completion of the course, learner will be able to

C204.1	Illustrate computer architecture design and solve problems of arithmetic operations.
C204.2	Explain computer memory system and I/O systems.
C204.3	Explain instruction set architecture of a processor.
C204.4	Differentiate and illustrate design alternatives in the processor organization.

205: Course Name: 210245 - **Object Oriented Programming**

On the completion of the course, learner will be able to

C205.1	Define concepts of OOP.
C205.2	Write programming applications using inheritance, polymorphism and virtual function.
C205.3	Explain templates, Standard Template Library and exception handling in C++ programming.
C205.4	Explain concepts of file handling in Object Oriented Programming.

206: Course Name: 210246 - **Digital Electronics Lab**

On the completion of the course, learner will be able to

C206.1	Simplify and Implement Boolean expressions for designing digital circuits using KMaps
C206.2	Design and implement Sequential and Combinational digital circuits as per the specifications.
C206.3	Design simple digital circuits using VHDL
C206.4	Compare the functionalities, properties and applicability of Logic Families

207: Course Name: 210248- **Data Structures Lab**

On the completion of the course, learner will be able to

C207.1	Experiment with various set operations and matrix operations using Array.
C207.2	Construct real world problems using singly and doubly linear data structure.
C207.3	Test for "Expression is well parenthesized or not" and Expression conversion using Stack concepts.
C207.4	Simplify applications based on the concept of Simple and circular queue.
C207.5	Compare Searching and Sorting techniques based on time complexity.

208: Course Name: 210248 - **Object Oriented Programming Lab**

On the completion of the course, learner will be able to

C208.1	Analyze and develop solutions for real time problems using features of OOP in C++.
C208.2	Develop programs using templates, exception handling and file handling concepts of OOPs.
C208.3	Utilize STL to develop C++ program for linked and sequential organization
C208.4	Design and develop mini project using features of OOP.

209: Course Name: 210249 - **Soft Skills**

On the completion of the course, learner will be able to

C209.1	Establish effective communication among Peers.
C209.2	Prepare effective reports, technical documents and presentations.
C209.3	Cope with stress, possess human values, morals and ethics.
C209.4	Express inter personal skills and soft skills.

210: Course Name: 210250 - **Audit Course 1**

On the completion of the course, learner will be able to

C210.1	Describe the basics of German language.
C210.2	Express the knowledge in German language.
C210.3	Developed interest to pursue professional German language course.

211: Course Name: 207003 - **Engineering Maths - III**

On the completion of the course, learner will be able to

C211.1	Solve higher order linear Differential equations and model L-C-R electrical circuits.
C211.2	Evaluate Fourier Transform, Inverse Fourier Transform, Z-transform, and Inverse Z transform
C211.3	Analyze given data using measures of central tendency, dispersion, moments,skewness, kurtosis, correlation-regression.
C211.4	Apply techniques of Probability, Probability Distributions and Chi-Square Testto analyze given data
C211.5	Apply vector differential operators to deal with Directional Derivatives, Vector Identities, Scalar Potential, Solenoidal, Irrotational and Conservative Fields, Greens, Gauss divergence, Stokes theorem to evaluate Line integral, Surface integral, volume integrals and solve problems in Electromagnetic fields.
C211.6	Check analytic functions using Cauchy Riemann Theorem, evaluate bilinear transformation and apply Cauchy's integral theorem, residue theorem to evaluate line integrals in the complex plane.

212: Course Name: 210251 - **Computer Graphics**

On the completion of the course, learner will be able to

C212.1	Define Graphics primitives and Explain polygon clipping algorithms
C212.2	Illustrate 2D and 3D Transformations and Projections in the domain of Computer Graphics.
C212.3	Explain Illumination models and shading algorithm.
C212.4	Apply the logic to implement animation and gaming programs.

213: Course Name: 210252 - **Advanced Data Structures**

On the completion of the course, learner will be able to

C213.1	Experiment with appropriate advanced data structure like tree and graph.
C213.2	Implement solutions for real world problems using hash tables and search trees
C213.3	Explain different indexing techniques and multiway trees.
C213.4	Organize data using different file organizations.

214: Course Name-210253- **Microprocessor**

On the completion of the course, learner will be able to

C214.1	Illustrate basic model, system architecture and memory management of 80386DX microprocessor.
C214.2	Explain concepts of multitasking, protection, Exception and Interrupt handling of 80386DX.
C214.3	Find errors and Debug programs written in assembly language.
C214.4	Explain signals and bus cycles of 80386 and Illustrate the architecture of 80387 coprocessor.

215: Course Name-210254- **Principles of Programming Languages**

On the completion of the course, learner will be able to

C215.1	Explain Significance of syntax and semantics for programming languages to write efficient and effective programs.
C215.2	Explain various data types, programming structure and different programming paradigms
C215.3	Describe and Apply OOP features in JAVA programming.
C215.4	Discuss exception handling and basics of Applet in JAVA.

216: Course Name-210255- **Computer Graphics Lab**

On the completion of the course, learner will be able to

C216.1	Explain and Implement line drawing and circle drawing algorithms in computer graphics.
C216.2	Develop polygon filling and clipping algorithms.
C216.3	Explain and Implement Curve Generation algorithms using concept of fractals.
C216.4	Apply 2D and 3D transformations for objects.

217: Course Name-210256- **Advanced Data Structures Lab**

On the completion of the course, learner will be able to

C217.1	Apply the concepts of tree and graph to solve real world problems.
C217.2	Implement hash tables and search trees.
C217.3	Design and implement different STLs to solve the problems of various domains.
C217.4	Write programs using Java Concepts.

218: Course Name-210257- **Microprocessor Lab**

On the completion of the course, learner will be able to

C218.1	Write and execute assembly language programs (ALP) to perform data transfer Operations.
C218.2	Experiment with processor and coprocessor by writing ALPs to perform arithmetic Operations.
C218.3	Develop ALPs to perform logical operations.
C218.4	Experiment with control instructions to write ALPs to control operations of the Processor.

219: Course Name-210258- **Audit Course 2**

On the completion of the course, learner will be able to

C219.1	Compare the importance of gym and yoga
C219.2	Explain the significance of stress management
C219.3	Explain the power of concentration, focus and awareness
C219.4	Identify the influence of ayurveda in healthcare

T.E COMPUTER ENGINEERING

301: Course Name: 310241 – **Theory of Computation**

On the completion of the course, learner will be able to

C301.1	Interpret basic concepts of formal language theory and finite automata.
C301.2	Analyze and construct the finite automata for regular expression.
C301.3	Utilize Context Free Grammar to define language.
C301.4	Construct Turing machines for different languages.
C301.5	Build a Push Down Automata for a given Context Free Language.
C301.6	Analyze the algorithmic problems into P and NP.

302: Course Name: 310242 – **Database Management Systems (DBMS)**

On the completion of the course, learner will be able to

C302.1	Illustrate the basic concepts of DBMS and Construct E-R Model.
C302.2	Develop queries using Structure Query Language SQL and PL/ SQL for creation and manipulation of Database.
C302.3	Analyze and apply the concepts of normalization in relational database System.
C302.4	Demonstrate Database Transactions and Transaction Management.
C302.5	Explain different database architecture.

303: Course Name: 310243 – **Software Engineering & Project Management**

On the completion of the course, learner will be able to

C303.1	Choose the process model, analyze the software requirements.
C303.2	Design a software system and Explain the architecture, user interface, components for a software system.
C303.3	Determine risks and estimate the project cost and schedule for Software being developed.
C303.4	Explain a testing strategy for software system and write test cases.
C303.5	Choose the process model, analyze the software requirements.

304: Course Name: 310244 – **Information Systems & Engineering Economics**

On the completion of the course, learner will be able to

C304.1	Explain various forms of information systems & its applications in an organization.
C304.2	Explain the role of the major types of information systems in a business environment and their relationship to each other.
C304.3	Solve problems on time value of money.
C304.4	Apply the appropriate engineering economics and **analyze** the software enterprises from similar domains.
C304.5	Explain the effects of depreciation, income taxes, inflation and price change in engineering economics.

305: Course Name: 310245 – **Computer Networks (CN)**

On the completion of the course, learner will be able to

C305.1	Explain the fundamental concepts of wired and wireless Networks.
C305.2	Solve the design issues related to sub layers of Data Link Layer.
C305.3	Identify different routing protocols at Network Layer.
C305.4	Analyze data flow through transport and application layers of TCP/IP model.
C305.5	Explain the fundamental concepts of wired and wireless Networks.

306: Course Name: 310246– **Skills Development Lab**

On the completion of the course, learner will be able to

C306.1	Make use of data structures and collection framework to develop a system.
C306.2	Apply socket programming, JDBC, multithreading concept to develop a system.
C306.3	Develop a real-time application in team and demonstrate it.
C306.4	Solve problems of critical thinking, logical ability and vocabulary skills
C306.5	Make use of data structures and collection framework to develop a system.

307: Course Name: 310247– **DBMS Lab**

On the completion of the course, learner will be able to

C307.1	Design and implement database using SQL queries.
C307.2	Solve real world problems using PL/SQL for creation and manipulation of Database.
C307.3	Compile queries for NOSQL databases.
C307.4	Build a database application using basic and advanced database concepts.

308: Course Name: 310248– **CN Lab**

On the completion of the course, learner will be able to

C308.1	Assess the network for data transfer, error control and flow control.
C308.2	Construct routing algorithm with the help of modern tools.
C308.3	Analyze socket programming at transport layer.
C308.4	Elaborate the services provided by application layer across the network.

309: Course Name: 310249– **Audit Course 3**

On the completion of the course, learner will be able to

C309.1	Explain the elements of Information security and models of N/W security.
C309.2	Classify different authentication methods, protocols and services.
C309.3	List different standards for electronic mail security and web security.
C309.4	Explain intrusion detection system, firewall and hacking.

310: Course Name: 310250-**Design & Analysis of Algorithms**

On the completion of the course, learner will be able to

C310.1	Explain the fundamentals of algorithm using design methods.
C310.2	Apply the appropriate algorithmic strategy to solve problems.
C310.3	Analyze the time and space complexity of various algorithms and problems.
C310.4	Explain the concepts of Multithreaded and Distributed Algorithms.

311: Course Name: 310251-**Systems Programming & Operating System (SP&OS)**

On the completion of the course, learner will be able to

C311.1	Relate and Explain the functioning of system software.
C311.2	Analyze Language Translators.
C311.3	Explain and Analyze process structure, its management and process sub system.
C311.4	Explain memory management and I/O management.

312: Course Name: 310252-**Embedded Systems & Internet of Things**

On the completion of the course, learner will be able to

C312.1	Explain basics of embedded system and internet of things.
C312.2	Describe various IoT platform specifications & Explain basic building blocks of IoT devices.
C312.3	List and Explain IoT Protocols and Security for real time applications.
C312.4	Explain IoT physical servers and web services.

313: Course Name: 310253-**Software Modeling and Design**

On the completion of the course, learner will be able to

C313.1	Compare Software Methodologies and Model a software system using unified Modeling Language.
C313.2	Illustrate the architecture of the software to be developed.
C313.3	Identify design patterns in software systems and discover the best suited pattern for a particular System.
C313.4	Identify test cases for various applications and Evaluate the quality of software system.

314: Course Name: 310254-**Web Technology**

On the completion of the course, learner will be able to

C314.1	Explain web development process and Develop web applications using front end tools
C314.2	Explain client side, server side technologies and Develop web applications using it.
C314.3	Compare client side frameworks with server side frameworks and Develop web applications using it.
C314.4	Develop web applications using web services and Content Management System.

315: Course Name: 310255-**Seminar & Technical Communication**

On the completion of the course, learner will be able to

C315.1	Identify & Choose the appropriate domain (area).
C315.2	Summarize the literature survey on problems and deduce the problem statement.
C315.3	Compile the documents for an identified problem.
C315.4	Express the idea, concepts and solution of the selected problem ethically as an individual.

316: Course Name: 310256-**Web Technology Lab**

On the completion of the course, learner will be able to

C316.1	Apply the concepts of web server installation, configuration and Design & Develop a web application using Front End Tools.
C316.2	Design & Develop a web application using suitable client side and server side web technologies.
C316.3	Develop a web application using Client and Server Side Frameworks.
C316.4	Design & Develop a web application using Web Services or Content Management System.

317: Course Name: 310257-**SP & OS Lab**

On the completion of the course, learner will be able to

C317.1	Design and Develop pass – I and pass – II of two pass assembler and macroprocessor.
C317.2	Construct lexical analyzer and parsers using Lex and YACC tools.
C317.3	Write a program to create Dynamic Link Libraries.
C317.4	Compare and Develop various scheduling schemes.

318: Course Name: 310258-**ES & IoT Lab**

On the completion of the course, learner will be able to

C318.1	Compare the different ARM based micro controllers and demonstrate the connectivity with peripherals.
C318.2	Develop real time application using Raspberry-Pi, Peripherals and sensors
C318.3	Develop web applications using Zigbee module and cloud on Raspberry- Pi/Beagle board.
C318.4	Develop an IoT based Real time application in a team.

319: Course Name: 310259-**Audit Course 4**

On the completion of the course, learner will be able to

C319.1	Create blogs to manage content distribution.
C319.2	Utilize Social Listening tools to create timely, relevant content.
C319.3	Understand Social Media policies that combine business objectives with appropriate use of social media channels and content.
C319.4	Create content calendar for social media platforms.

BE COMPUTER ENGINEERING

401: Course Name: 410241-**High Performance Computing**

On the completion of the course, learner will be able to

C401.1	Explain the basics of parallel computing.
C401.2	Develop an efficient parallel algorithm to solve a problem.
C401.3	Analyze and measure performance of parallel programs.
C401.4	Explain the logic to parallelize the sorting and graph algorithms.

402: Course Name: 410241-**Artificial Intelligence and Robotics**

On the completion of the course, learner will be able to

C402.1	Choose a search strategy and apply it to solve uninformed/ informed/ heuristic search.
C402.2	Analyze and solve problems related to planning and constraint satisfaction.
C402.3	Represent and solve problems related to certain knowledge and reasoning.
C402.4	Explain significance of natural language processing, information retrieval and types of learning.
C402.5	Explain concepts of robot components and real world robot applications.

403: Course Name: 410243-**Data Analytics**

On the completion of the course, learner will be able to

C403.1	Explain the basic concept of Data Analytics.
C403.2	Apply an appropriate algorithmic strategy to solve problems of data.
C403.3	Analyze and Compare various algorithmic strategy related to data.
C403.4	Explain the basics of Tools used for unstructured data.

404: Course Name: 410244-**Data Mining and Warehousing**

On the completion of the course, learner will be able to

C404D.1	Explain data Mining concepts and Apply pre-processing techniques.
C404D.2	Explain data warehouse concept and architecture and make use of various OLAP operations.
C404D.3	Identify and Choose data similarity and dissimilarity techniques.
C404D.4	Apply Association rule mining techniques and Analyze patterns.
C404D.5	Apply classification algorithms and Analyse it's performance.

405: Course Name: 410245-**Software Testing and Quality Assurance**

On the completion of the course, learner will be able to

C405B.1	Explain basic concepts in software testing and quality assurance.
C405B.2	Prepare project test plan and write test cases for testing.
C405B.3	Make use of recent automation tool for software testing.
C405B.4	Explain quality management and identify the software quality tools to be used for a system.

406 Course Name: 410246-**Laboratory Practice I**

On the completion of the course, learner will be able to

C406.1	Develop and analyze various parallel programs.
C406.2	Implement AI algorithmic strategies for solving various problems.
C406.3	Analyze various datasets using data analytics techniques and tool.
C406.4	Design and develop the applications based on the concepts of parallel algorithm, robotics and data analysis.

407: Course Name: 410247-**Laboratory Practice II**

On the completion of the course, learner will be able to

C407.1	Apply data mining techniques for given data set using data mining Tools.
C407.2	Analyze classification algorithms using data mining Tool.
C407.3	Develop an application and Apply black box, white box testing.
C407.4	Apply automation tool on web based application and generate test reports.

408: Course Name: 410248-**Project Work Stage I**

On the completion of the course, learner will be able to

C408.1	Choose the members of the team and select the domain for project work.
C408.2	Summarize the literature survey on techniques / algorithms for the domain and decide the problem statement of the project.
C408.3	Analyze the problem statement and compile the SRS, plan and design solution to the problem and estimate the project cost.
C408.4	Inculcate confidence, ethics and present themselves in a professional manner as a team.

409: Course Name: 410249-**Audit Course 5**

On the completion of the course, learner will be able to

C409.1	Apply professional and technical skills.
C409.2	Make use of modern technologies.
C409.3	Extend self-directed learning for advanced courses.

410: Course Name: 410250-**Machine Learning**

On the completion of the course, learner will be able to

C410.1	Apply preprocessing methods to prepare training data set for machine learning.
C410.2	Explain and apply regression techniques.
C410.3	Explain and apply supervised machine learning.
C410.4	Explain clustering techniques and deep network.

411: Course Name: 410251-**Information and Cyber Security**

On the completion of the course, learner will be able to

C411.1	Inspect Network security architecture.
C411.2	Analyze and compare symmetric key & asymmetric key.
C411.3	Evaluate various cryptography measures to ensure privacy & confidentiality.
C411.4	Classify the Indian cyber laws.

412B: Course Name: 410251-**Compilers**

On the completion of the course, learner will be able to

C412B.1	Apply the knowledge of LEX and YACC to Develop LEX and parser.
C412B.2	Construct different types of grammar and Apply it for intermediate code generation.
C412B.3	Compare and Contrast different storage management schemes.
C412B.4	Explain Code generation and Identify sources for code optimization.

413C: Course Name: 410253-**Cloud Computing**

On the completion of the course, learner will be able to

C413C.1	Explain the basic concept of Cloud Computing & Compare different types of parser
C413C.2	Make use of Virtualization technique
C413C.3	Select appropriate AWS Services & Explain role of IOT in Cloud Computing
C413C.4	Explain future cloud computing techniques & Dockers Workflow.

413D: Course Name: 410257-**Business Intelligence**

On the completion of the course, learner will be able to

C413D.1	Apply basics of Business Intelligence and Knowledge Delivery techniques to analyze the data.
C413D.2	Explain concepts, techniques and applications of Decision Support System.
C413D.3	Explain & Apply various data Pre-processing techniques.
C413D.4	Apply various Data Mining Techniques and explain business intelligence applications in various sectors.

C414: Course Name: 410254-**Laboratory Practice III**

On the completion of the course, learner will be able to

C414.1	Analyze the data set and apply different supervised Learning techniques.
C414.2	Analyze the data set and apply different unsupervised Learning techniques.
C414.3	Apply standard encryption techniques to provide Security.
C414.4	Apply an algorithm for authentication and Confidentiality.

C415: Course Name: 410255-**Laboratory Practice IV**

On the completion of the course, learner will be able to

C415.1	Construct Lexical analyzer and Parsers using LEX and YACC tools.
C415.2	Make use of various code optimization and generation algorithms to build the compiler.
C415.3	Apply BIA techniques to analyze the data. /Install, configure and develop a Cloud.
C415.4	Analyze the data set using Business Intelligence tools. /Implement virtualization in cloud computing.

C416: Course Name: 410256-**Project Work Stage II**

On the completion of the course, learner will be able to

C416.1	Make use of various modern technologies / tools required to develop the project.
C416.2	Evaluate quality and performance of the project, and ensure environmental context and sustainability.
C416.3	Compile the project report and demonstrate the working of the project.
C416.4	Inculcate confidence, ethics and present themselves in a professional manner as a team.

C417: Course Name: 410257-**Audit Course 6**

On the completion of the course, learner will be able to

C417.1	Apply professional and technical skills.
C417.2	Make use of modern technologies.
C417.3	Extend self-directed learning for advanced courses.