Computer Science & Engineering

POs, PSOs, Cos

Program Outcomes

1. **PO-1: Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **PO-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. **PO-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. **PO-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. **PO-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. **PO-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. **PO-7: Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of need for sustainable development.
8. **PO-8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **PO-9: Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **PO-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. **PO-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. **PO-12: Life-long learning:** Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Program Specific Outcomes

1. **PSO-1: Problem-Solving Skills:** An ability to investigate and solve a problem by analysis, interpretation of data, design and implementation through appropriate techniques, tools and skills.
2. **PSO-2: Professional Skills:** An ability to apply algorithmic principles, computing skills and computer science theory in the modelling and design of computer-based systems.

3. **PSO-3: Entrepreneurial Ability:** An ability to apply design, development principles and management skills in the construction of software product of varying complexity to become an entrepreneur.

Course Outcomes

Course Name/Code: DATA STRUCTURES AND APPLICATIONS/18CS32	Semester of Study III

C2 32.1	Use different types of data structures, operations and algorithms
C2 32.2	Apply searching and sorting operations on files
C2 32.3	Use stack, Queue, Lists, Trees and Graphs in problem solving
C2 32.4	Implement all data structures in a high-level language for problem solving.

Course Name/Code: ANALOG AND DIGITAL ELECTRONICS/18CS33	Semester of Study III

C2 33.1	Design and analyze application analog circuits using photodevices, timer IC, powersupply and regulator IC and opamp.
C2 33.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
C2 33.3	Simplify digital circuits using Karnaugh Map , POS and Quine-McClusky Methods
C2 33.4	Explain Gates and flipflops and make us in designing different data processing circuits, registers and counters and compare the types
C2 33.5	Develop simple HDL programs

Course Name/Code: COMPUTER ORGANIZATION/18CS34	Semester of Study III

C2 34.1	Explain the basic organization of a computer system.
C2 34.2	Demonstrate functioning of different sub systems, such as processor, Input/output, and memory.
C2 34.3	Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems.
C2 34.4	Design and analyse simple arithmetic and logical units.

Course Name/Code: SOFTWARE ENGINEERING/18CS35	Semester of Study III

C2 35.1	Design a software system, component, or process to meet desired needs within realistic constraints.
C2 35.2	Assess professional and ethical responsibility
C2 35.3	Function on multi-disciplinary teams

C2 35.4	Use the techniques, skills, and modern engineering tools necessary for engineering practice

C2 35.5	Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems

Course Name/Code: DISCRETE MATHEMATICAL STRUCTURES/18CS36	Semester of Study III

C2 36.1	Use propositional and predicate logic in knowledge representation and truth verification.
C2 36.2	Demonstrate the application of discrete structures in different fields of computer science.
C2 36.3	Solve problems using recurrence relations and generating functions..
C2 36.4	Application of different mathematical proofs techniques in proving theorems in the courses
C2 36.5	Compare graphs, trees and their applications.

Course Name/Code: DESIGN AND ANALYSIS OF ALGORITHMS/ 18CS42	Semester of Study IV

C2 42.1	Describe computational solution to well known problems like searching, sorting etc.
C2 42.2	Estimate the computational complexity of different algorithms.
C2 42.3	Devise an algorithm using appropriate design strategies for problem solving

Course Name/Code: OPERATING SYSTEMS/ 18CS43	Semester of Study IV

C2 43.1	Demonstrate need for OS and different types of OS
C2 43.2	Apply suitable techniques for management of different resources
C2 43.3	Use processor, memory, storage and file system commands •
C2 43.4	Realize the different concepts of OS in platform of usage through case studies

Course Name/Code: MICROCONTROLLER AND EMBEDDED SYSTEMS/18CS44	Semester of Study IV

C2 44.1	Describe the architectural features and instructions of ARM microcontroller
C2 44.2	Apply the knowledge gained for Programming ARM for different applications.
C2 44.3	Interface external devices and I/O with ARM microcontroller.
C2 44.4	Interpret the basic hardware components and their selection method based on the characteristics and attributes of an embedded system
C2 44.5	Develop the hardware /software co-design and firmware design approaches.
C2 44.6	Demonstrate the need of real time operating system for embedded system applications

Course Name/Code: OBJECT ORIENTED CONCEPTS/18CS45	Semester of Study IV

C2 45.1	Explain the object-oriented concepts and JAVA
C2 45.2	Develop computer programs to solve real world problems in Java.

C2 44.4	Develop simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles using Applets and swings.

Course Name/Code: DATA COMMUNICATION/18CS46	Semester of Study IV

C2 46.1	Explain the various components of data communication

C2 46.2	Explain the fundamentals of digital communication and switching.
C2 46.3	Compare and contrast data link layer protocols
C2 46.4	Summarize IEEE 802.xx standards

Course Name/Code: MANAGEMENT AND ENTREPRENEURSHIP FOR IT INDUSTRY/18CS52	Semester of Study V

C3 52.1	Explain principles of application layer protocols
C3 52.2	Recognize transport layer services and infer UDP and TCP protocols
C3 52.3	Classify routers, IP and Routing Algorithms in network layer
C3 52.4	Understand the Wireless and Mobile Networks covering IEEE 802.11 Standard
C3 52.5	Describe Multimedia Networking and Network Management

Course Name/Code: DATABASE MANAGEMENT SYSTEM/18CS53	Semester of Study V

C3 52.1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
C3 52.2	Use Structured Query Language (SQL) for database manipulation
C3 52.3	Design and build simple database systems
C3 52.4	Develop application to interact with databases.

Course Name/Code: AUTOMATA THEORY AND COMPUTABILITY/18CS54	Semester of Study V

C3 54.1	Learn how to translate between different models of Computation (e.g., Deterministic and Non-deterministic and Software models).
C3 54.2	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation
C3 54.3	Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers..
C3 54.4	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness
C3 54.5	Classify a problem with respect to different models of Computation.

Course Name/Code: RAPID APPLICATION DEVELOPMENT USING PYTHON/ 18CS55	Semester of Study V

C3 55.1	Demonstrate proficiency in creating functions and handling of lists and dictionaries.
C3 55.2	Discover commonly used operations involving strings and regular expressions..
C3 55.3	Interpret the concepts of Object-Oriented Programming as used in Python
C3 55.4	Determine the need for scraping websites and working with CSV, JSON and other file formats.
C3 55.5	Make use of modules for manipulating the images, keeping track of time and for sending emails using Python.

Course Name/Code: UNIX PROGRAMMING/ 18CS56	Semester of Study V

C3 55.1	Explain Unix Architecture, File system and use of Basic Commands
C3 55.2	Illustrate Shell Programming and to write Shell
C3 55.3	Categorize, compare and make use of Unix System
C3 55.4	Build an application/service over a Unix system.

Course Name/Code: FILE STRUCTURES/ 18IS61	Semester of Study VI

C3 61.1	Choose appropriate file structure for storage representation.
C3 61.2	Identify a suitable sorting technique to arrange the data.
C3 61.3	Select suitable indexing and hashing techniques for better performance to a given problem.

Course Name/Code: SOFTWARE TESTING /18IS62	Semester of Study VI

C3 62.1	Derive test cases for any given problem
C3 62.2	Compare the different testing techniques
C3 62.3	Classify the problem into suitable testing model
C3 62.4	Apply the appropriate technique for the design of flow graph
C3 62.5	Create appropriate document for the software artefact.

Course Name/Code: CLOUD COMPUTING AND ITS APPLICATIONS/18CS63	Semester of Study VI

C3 63.1	Explain cloud computing, virtualization and classify services of cloud computing .
C3 63.2	Illustrate architecture and programming in cloud
C3 63.3	Describe the platforms for development of cloud applications and List the application of cloud.

Course Name/Code: DATA MINING AND DATA WAREHOUSING/18CS641	Semester of Study VI

C3 641.1	Identify data mining problems and implement the data
C3 641.2	Write association rules for a given data pattern
C3 641.3	Choose between classification and clustering solution.

Course Name/Code: OBJECT ORIENTED MODELING AND DESIGN/ 18CS642	Semester of Study VI

C3 642.1	Describe the concepts of object-oriented and basic class modelling.
C3 642.2	Draw class diagrams, sequence diagrams and interaction diagrams to solve problems.
C3 642.3	Choose and apply a befitting design pattern for the given problem.

Course Name/Code: CRYPTOGRAPHY, NETWORK SECURITY AND CYBERLAW/18CS643	Semester of Study VI

C3 643.1	Discuss cryptography and its need to various applications
C3 643.2	Design and develop simple cryptography algorithms
C3 643.3	Understand cyber security and need cyber Law

Course Name/Code: MOBILE APPLICATION DEVELOPMENT/ 18CS651	Semester of Study VI

C3 651.1	Create, test and debug Android application by setting up Android development environment
C3 651.2	Implement adaptive, responsive user interfaces that work across a wide range of devices
C3 651.3	Infer long running tasks and background work in Android applications

C3 651.4	Demonstrate methods in storing, sharing and retrieving data in Android applications
C3 651.5	Analyze performance of android applications and understand the role of permissions and security

C3 651.6	Describe the steps involved in publishing Android application to share with the world

Course Name/Code: INTRODUCTION TO DATA SRUCTURES AND ALGORITHMS/18CS652	Semester of Study VI

C3 652.1	Identify different data structures in C programming language
C3 652.2	Appraise the use of data structures in problem solving
C3 652.3	Implement data structures using C programming language

Course Name/Code: PYTHON APPLICATION PROGRAMMING/18CS653	Semester of Study VI

C3 653.1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions
C3 653.2	Demonstrate proficiency in handling Strings and File Systems.
C3 653.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions
C3 653.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C3 653.4	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

Course Name/Code: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING/18CS71	Semester of Study VII

C4 71.1	Appaise the theory of Artificial intelligence and Machine Learning
C4 71.2	Illustrate the working of AI and ML Algorithms.
C4 71.3	Demonstrate the applications of AI and ML.

Course Name/Code: BIG DATA AND ANALYTICS/18CS72	Semester of Study VII

C4 72.1	Master the concepts of HDFS and MapReduce
C4 72.2	Investigate Hadoop related tools for Big Data Analytics and perform basic Hadoop
C4 72.3	Recognize the role of Business Intelligence
C4 72.4	Infer the importance of core data mining techniques for data analytics
C4 72.5	Compare and contrast different Text Mining Techniques

Course Name/Code: INTERNET OF THINGS/18CS731	Semester of Study VII

C4 731.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models..
C4 731.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network
C4 731.3	Appraise the role of IoT protocols for efficient network communication
C4 731.4	Elaborate the need for Data Analytics and Security in IoT
C4 731.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.

Course Name/Code: ADVANCED JAVA AND J2EE/ 18CS732	Semester of Study VII

C4 732.1	Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient
C4 732.2	Build client-server applications and TCP/IP socket programs
C4 732.3	Illustrate database access and details for managing information using the JDBC API

C4 732.4	Describe how servlets fit into Java -based web application architecture
C4 732.5	Develop reusable software components using Java Beans

Course Name/Code: INFORMATION MANAGEMENT SYSTEM/ 18IS733	Semester of Study VII

C4 733.1	Describe the role of information technology and information systems in business
C4 733.2	Record the current issues of information technology and relate those issues to the firm
C4 733.3	Interpret how to use information technology to solve business problems

Course Name/Code: DIGITAL IMAGE PROCESSING/ 18CS741	Semester of Study VII

C4 741.1	Explain fundamentals of image processing
C4 741.2	Compare transformation algorithms
C4 741.2	Contrast enhancement t, segmentation and compression techniques

Course Name/Code: NETWORK MANAGEMENT/ 18CS742	Semester of Study VII

C4 742.1	Analyze the issues and challenges pertaining to management of emerging network technologies such as wired/wireless networks and high-speed internets.
C4 742.2	Apply network management standards to manage practical networks
C4 742.3	Formulate possible approaches for managing OSI network model.
C4 742.4	Use on SNMP for managing the network
C4 742.5	Identify the various components of network and formulate the scheme for the managing them

Course Name/Code: WEB TECHNOLOGY AND ITS APPLICATIONS/ 18CS743	Semester of Study VII

C4 743.1	Adapt HTML and CSS syntax and semantics to build web pages.
C4 743.2	Construct and visually format tables and forms using HTML and CSS
C4 743.3	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.
C4 743.4	Appraise the principles of object oriented development using PHP
C4 743.5	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.

Course Name/Code: - INTRODUCTION TO BIG DATA ANALYTICS/ 18CS751	Semester of Study VII

C4 751.1	Explain the importance of data and data analysis
C4 751.2	Interpret the probabilistic models for data
C4 751.3	Define hypothesis,uncertainty principle
C4 751.4	Evaluate regression analysis

Course Name/Code: - PROGRAMMING IN JAVA/ 18CS752	Semester of Study VII

C4 752.1	Explain the object t-oriented concepts and JAVA.
C4 752.2	Develop computer programs to solve real world problems in Java. Develop simple GUI interfaces for a computer program to interact with users

Course Name/Code: - INTRODUCTION TO OPERATING SYSTEM/18CS753	Semester of Study VII

C4 753.1	Explain the fundamentals of operating system
C4 753.2	Comprehend process management, memory management and storage management.
C4 753.3	Familiar with various types of operating systems

Course Name/Code: - MOBILE COMPUTING/18CS821	Semester of Study VIII

C4 821.1	Explain state of art techniques in wireless communication.
C4 821.2	Discover CDMA, GSM. Mobile IP, WImax
C4 821.3	Demonstrate program for CLDC, MIDP let model and security concerns

Course Name/Code: ADVANCED COMPUTER ARCHITECTURES/18CS822	Semester of Study VIII

C4 822.1	Explain the concepts of parallel computing and hardware technologies
C4 822.2	Compare and contrast the parallel architectures
C4 822.3	Illustrate parallel programming concepts

Course Name/Code: NOSQL DATABASE/18CS823	Semester of Study VIII

C4 823.1	Define, compare and use the four types of NoSQL Databases (Document-oriented, KeyValue Pairs, Column-oriented and Graph)
C4 823.2	Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Columnn-oriented NoSQL databases
C4 823.3	Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.