

MSC COMPUTER SCIENCE

Course Outcomes

Semester I Paper name: DISCRETE MATHEMATICAL STRUCTURES Code: CSS1C01
Course Outcomes: CO1: Verify the validity of an argument using propositional and predicate logic. CO2: Understand allocations of set theory by applying operations on set. CO3: Apply operations of relations and functions in discrete structures. CO4: Understand applications of Lattices and Boolean algebra in computer science domain. CO5: Identify Group, Ring and Field in Group Theory CO6: Understand applications of Graph Theory and Tree CO7: Apply the concepts of graph theory and trees to formulate problem solving
Semester I Paper name: ADVANCED DATA STRUCTURES Code: CSS1C02
Course Outcomes: CO1: Summarize different categories of data structures. CO2: Design algorithms to perform operations with linear and non – linear data structures. CO3: Describe how arrays, linked lists, stacks, queues, trees and graphs are represented in memory and used by algorithms. CO4: Describe common applications for arrays, linked lists, stack, queue, tree and graphs. CO5: Demonstrate different methods for traversing trees. CO6: Design and implement an appropriate hashing function for an application. CO7: Discuss the computational efficiency of the principal algorithms for sorting, searching and hashing. CO8: Describes various types of trees and heap structures.
Semester I Paper name: THEORY OF COMPUTATION Code: CSS1C03
Course Outcomes: CO1: Describe broad overview of the theoretical foundations of computer science. CO2: Understand regular languages and finite automata. CO3: Apply the concept of context free languages in problem solving. CO4: Solve various problems of applying normal form techniques, push down automata and Turing Machines. CO5: Propose solutions for the problems based on computability and decidability.

Semester I
Paper name: THE ART OF PROGRAMMING METHODOLOGY
Code: CSS1C04

Course Outcomes:

- CO1: Improve ability to develop effective algorithms.
- CO2: Understand the fundamental principles of problem-solving using computers.
- CO3: Demonstrate the applications of the programming constructs including decision making, looping, arrays and strings.
- CO4: Conceptualize modular programming basics using functions, structures and Unions
- CO5: Understand features like pointers and macros and to become familiar with programming with files
- CO6: Design, develop, implement, test and document well-structured and reliable computer programs using the C programming language.

Semester I
Paper name: COMPUTER ORGANIZATION & ARCHITECTURE
Code: CSS1C05

Course Outcomes:

- CO1: Identify, understand and apply different number systems and codes.
- CO2: Understand the digital representation of data in a computer system.
- CO3: Understand the general concepts in digital logic design and their use in sequential and combinational circuit design.
- CO4: Describe fundamental organization of a computer system.
- CO5: Explain addressing modes, instruction formats and program control statements.
- CO6: Understand computer arithmetic formulae and solve problems.
- CO7: Distinguish the organization of various parts of a system memory hierarchy.
- CO8: Identify and compare different methods for computer I/O

Semester I
Paper name: PRACTICAL I
Code: CSS1L01

Course Outcomes:

- CO1: Develop programming skills using the fundamentals and basics of C language.
- CO2: Develop programs using the basic elements like control statements, arrays and strings.
- CO3: Design and implement the effective usage of arrays, structures, functions and pointers.
- CO4: Implement files handling and command line arguments.
- CO5: Demonstrate the concepts of stack, queue and linked list and apply various operations on them.
- CO6: Demonstrate the concept of tree traversal and its operations.
- CO7: Design program based on the concepts of sorting and searching techniques.

Semester I
Paper name: INTRODUCTION TO RESEARCH (ABILITY ENHANCEMENT AUDIT COURSE)
Code: CSS1A01

Course Outcomes:

- CO1: Understand research terminology.
- CO2: Apply the ethical principles of research.
- CO3: Identify the components of a literature review process.
- CO4: Critically analyze published research works.
- CO5: Innovate and apply research methods in the discipline of computing.

Semester II
Paper name: DESIGN AND ANALYSIS OF ALGORITHMS
Code: CSS2C06

Course Outcomes:

- CO1: Design algorithms in context of space and time complexity and apply asymptotic notation.
- CO2: Analyze the problem and develop the algorithms related to these problems.
- CO3: Classify the problems and apply the appropriate design strategy to develop algorithms.
- CO4: Analyze the problem and develop the algorithms related to these problems.
- CO5: Demonstrate the use of parallel algorithms.

Semester II
Paper name: OPERATING SYSTEM CONCEPTS COURSE
Code: CSS2C07

Course Outcomes:

- CO1: Understand the basic components of a computer operating system.
- CO2: Compare and interpret the applications of Process and threads.
- CO3: Describe the policies for scheduling, deadlocks, synchronization, system calls, and file systems.
- CO4: Illustrate the functioning of process management, memory management and file management Modules present in an OS.
- CO5: Differentiate various types of scheduling algorithms.
- CO6: Understand the concepts of Three-Tier Client/Server Architecture, Middleware and the characteristics of mobile operating systems.

Semester II
Paper name: COMPUTER NETWORKS
Code: CSS2C08

Course Outcomes:

- CO1: Understand the basics concepts of computer network organization and implementation.
- CO2: Describe theoretical understanding of layered network models - OSI and TCP/IP Models.
- CO3: Illustrate the functionalities of different network layers.
- CO4: Analyze the network application such as data transmission between client and server, file transfer, real-time and multimedia transmission.
- CO5: Explain the security aspects in networks and principles of cryptography.

Semester II**Paper name: COMPUTATIONAL INTELLIGENCE****Code: CSS2C09****Course Outcome:**

- CO1: Apply the basic principles, models, and algorithms of AI to recognize, model, and solve problems in the analysis and design of information systems.
- CO2: Conceptualize various knowledge representation techniques.
- CO3: Analyze the problem-solving methods and algorithms related to searching, reasoning, game playing and machine learning.
- CO4: Understand the functioning of expert systems and its importance.
- CO5: Demonstrate the implementation various AI algorithms to solve real life problems.

Semester II**Paper name: PRINCIPLES OF SOFTWARE ENGINEERING****Code: CSS2C10****Course Outcomes:**

- CO1: Understand the software process and development models.
- CO2: Understand the software design process and structured analysis of systems.
- CO3: Distinguish different types of modelling like DFD and UML.
- CO4: Illustrate the knowledge about the design of user interface.
- CO5: Apply the skill of project management and report preparation.

Semester II**Paper name: PRACTICAL II****Code: CSS2L02****Course Outcomes:**

- CO1: Discuss and formulate the problems based on the basic principles of networks.
- CO2: Implementation of different memory management techniques in OS.
- CO3: Implement various system operations of the operating system and also the various process scheduling algorithms.
- CO4: Understand the TCP/IP configuration for Windows and Linux.
- CO5: Design and implement various network applications such as data transmission between client

and server, file transfer, real-time multimedia transmission.
CO6: Understand different Linux/UNIX shell scripts and execute various shell programs.

Semester II

Paper name: TERM PAPER (PROFESSIONAL COMPETENCY AUDIT COURSE)
Code: CSS2A02

Course Outcomes:

CO1: Apply critical thinking skills analytical ability in problem solving.
CO2: Apply foundational research skills to address research problem.
CO3: Innovate, experiment and analyze research findings.
CO4: Demonstrate capacity to lead and manage change through a collaborative environment.
CO5: Innovate, experiment and analyze research findings and practice the process of scientific publishing.

Semester III

Paper name: ADVANCED DATABASE MANAGEMENT SYSTEM
Code: CSS3C11

Course Outcomes:

CO1: Explain the basics of database management system, concepts of relational data model, entity-relationship model, relational database design, relational algebra and calculus.
CO2: Apply the normalization techniques to improve the database design.
CO3: Describe various database manipulation commands in SQL.
CO4: Understand Transaction Processing & Locking using the concept of Concurrency control.
CO5: Conceptualize advanced features of Object-Oriented Database Management Systems and Distributed databases.

Semester III

Paper name: OBJECT ORIENTED PROGRAMMING CONCEPTS
Code: CSS3C12

Course Outcomes:

CO1: Recall the object-oriented programming concepts and basics of Java.
CO2: Design and implement object-oriented programs including packages and interfaces.
CO3: Explain and handle exceptions and threads.
CO4: Develop interactive programs using applets, AWT and swings.
CO5: Explain the concepts of JDBC, sockets and gives an introduction to Unified Modelling Language (UML).

Semester III

Paper name: PRINCIPLES OF COMPILERS
Code: CSS3C13

Course Outcomes:

- CO1: Understand the major phases of compilation, identify tokens of a typical high -level programming language, define regular expressions for tokens, design and implement a lexical analyzer.
- CO2: Develop the parsers and experiment the knowledge of different parsers design without automated tools.
- CO3: Construct the intermediate code representations and generation.
- CO4: Explain the role of different types of runtime environments and memory organization for implementation of typical programming languages.
- CO5: Apply the optimization techniques to have a better code for code generation.

Semester III
Paper name: PRACTICAL III
Code: CSS3L03

Course Outcomes:

- CO1: Design and development of relational database systems.
- CO2: Understand various advanced queries execution such as relational constraints, joins, set operations, aggregate functions, trigger and views.
- CO3: Apply various software to design and build ER Diagrams, UML, Flowchart for related database systems.
- CO4: Design and implement database applications on their own.
- CO5: Apply JDBC to provide a program level interface for communicating with database using Java programming.
- CO6: Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
- CO7: Understand Java programming concepts and utilize Java Graphical User Interface in program writing.
- CO8: Design and develop Java programs that solve real-world problems.

Semester IV
Paper name: PROJECT WORK
Code: CSS4P01

Course Outcomes:

- CO1: Demonstrate a depth of knowledge of modern technology.
- CO2: Practice to communicate effectively and to present ideas clearly and coherently to specific audiences in both the written and oral forms.
- CO3: Understand the project requirements, reflect on their learning and take appropriate actions to implement it.
- CO4: Estimate, plan, calculate, and adjust project variables.
- CO5: Understand the importance of iteration, evaluation and prototyping in design of a software system.

ELECTIVE COURSES

Semester III

Paper name: COMPUTER GRAPHICS

Code: CSS3E01

Course Outcomes:

- CO1: Understand the basics of computer graphics, different graphics systems and applications of computer graphics.
- CO2: Extract scene with different clipping methods and its transformation to graphics display device.
- CO3: Explore projections and visible surface detection techniques for display.
- CO4: Explore object representations and surface detection methods.
- CO5: Understand techniques and OpenGL programming concepts.

Semester III

Paper name: DATA WAREHOUSING AND DATA MINING

Code: CSS3E02

Course Outcomes:

- CO1: Understand the basic concepts of Data mining and warehousing.
- CO2: Identify the different techniques of data preprocessing.
- CO3: Analyze patterns that can be discovered by classification and clustering.
- CO4: Understand data mining techniques of clustering.
- CO5: Identify complex data types based on spatial and web mining.

Semester IV

Paper name: SYSTEM SECURITY

Code: CSS4E03

Course Outcomes:

- CO1: Familiarize with different types of securities in information systems, security goals and CIA.
- CO2: Illustrate computer system threats and various types of system attacks
- CO3: Identify different issues associated with system attacks and how attacking occurs; and various types of attackers
- CO4: Provide knowledge in operating system security, file protections, security assurance
- CO5: Understand important elements of Database security
- CO6: Define security planning, various types of security policies and risk analysis.

Semester IV

Paper name: DIGITAL IMAGE PROCESSING

Code: CSS4E04

Course Outcomes:

CO1: Understand the fundamental concepts of a digital image processing

CO2: Apply various image enhancement techniques

CO3: Describe various image enhancement techniques

CO4: Implement algorithms for handling intensive image restoration problems.

CO5: Identify and compare various image segmentation and representation techniques

CO6: Understand various image compression procedures.

