

COURSE OUTCOMES
Four-year Undergraduate Programme
Subject: Computer Science

Sem	Paper Code and Name	Course outcome
I	COM0101004: Introduction to C-Programming	At the end of the course, students will be able to: (a) Understand the basics of C programming like data types and operators (b) Understand and write program in C to implement conditions, loops, functions (c) Work on arrays, strings and basic file operations
I	Computer Fundamentals and Application Software (SEC)	At the end of the course, students will be able to: a) Understand the basics of Computer System b) Understand the basic of Software c) Work with Word Processing Software d) Work with a Spreadsheet Software e) Work with a Presentation Software
II	COM0200104: COMPUTER ORGANIZATION	At the end of the course, students will be able to: a) Describe the basic functional block of a computer. b) Discuss different ways to represent data in memory and arithmetic operations performed on the data. c) Explain the basic instruction set architectures of computer. d) Analyze the hierarchy of memory organization and Input-Output systems used in computer. e) Understand the basic architecture of 8085 microprocessor.
II	SEC0206203 HTML Programming	At the end of the course, students will be able to: a) Explain the structure and purpose of an HTML document. b) Develop a basic webpage using HTML elements and attributes. c) Inspect and debug HTML code for structural correctness. d) Design a multi-page website using HTML with proper elements.
III	COM0300104: Object Oriented Programming using C++	At the end of the course, students will be able to: a) Define OOP and describe basic data types, different operators, control structures, b) Function prototyping and call by reference method used in C++. c) Discuss about the concept of class, object, memory allocation for objects, d) concepts of constructors and destructors used in C++. e) Explain the concept of function overloading and operator overloading. f) Illustrate the concept of inheritance, polymorphism and exception handling g) mechanism. h) Design C++ program to illustrate different concepts like class, object, constructor, inheritance, virtual functions used in OOP.
III	COM0300204: Data Structure	At the end of the course, students will be able to: a) Distinguish between linear and non linear data

		<p>structures.</p> <p>b) Explain different operations performed on array, link list, stack, queue and</p> <p>c) binary tree.</p> <p>d) Discuss different operations performed on binary tree, representation of binary</p> <p>e) tree using array and link list...</p> <p>f) Explain about different sorting and searching algorithms applied on data.</p> <p>g) Analyze the time complexity and space complexity of algorithm.</p> <p>h) Design C++ program to show the operations performed on different data structure.</p>
IV	COM0400204: Database Management System	<p>At the end of the course, students will be able to:</p> <p>a) Describe database management system architectures, its types, advantages and</p> <p>b) disadvantages.</p> <p>c) Apply Entity Relationship modeling to real world problems and mapping ER to</p> <p>d) relational model.</p> <p>e) Interpret functional dependencies and categorize a table to specific normalization.</p> <p>f) Analyze various concurrency problems that may happen in database design process.</p> <p>g) Construct complex SQL queries to fetch, delete, update, and create data in DBMS software.</p>
IV	COM0400304: Mathematical Foundation of Computer Science	<p>At the end of the course, students will be able to:</p> <p>a) Define and describe sets, relations, functions, its properties and operations.</p> <p>b) Associate with the principles of counting, inclusion, induction and its applications.</p> <p>c) Analyze the growth of functions and discuss asymptotic notations.</p> <p>d) Distinguish and create different graphs, discuss its properties and applications.</p> <p>e) Solve problems that are revolving around mathematical logic e.g. connectives,</p> <p>f) truth, tables, tautologies and contradictions.</p>
IV	COM0400404: Operating System	<p>At the end of the course, students will be able to:</p> <p>a) Identify different operating systems and its types, functions, applications.</p> <p>b) Explain process, threads and solve process scheduling problems.</p> <p>c) Compare solutions of process synchronizations methods.</p> <p>d) Discuss process deadlock handling techniques.</p> <p>e) Solve memory management issues and discuss memory management solutions.</p>
IV	COM0400604: Python Programming	<p>At the end of the course, students will be able to:</p> <p>a) Identify different keywords, operators and input/output formatting in Python.</p> <p>b) Explain control statements and functions in Python</p> <p>c) Apply object-oriented programming principles in Python.</p> <p>d) Analyze the use cases of Python libraries and their significance in various applications.</p>

		e) Assess the robustness of Python code by applying exception handling and understanding the implications of database operations.
V	COM0500104: Computer Networks	At the end of the course, students will be able to: a) Define internet and describe different network topologies and types of networks. b) Discuss about different transmission mediums, encoding methods, c) transmissions modes and switching techniques. d) Explain the concept of framing, error control, stop and wait protocols sliding e) window protocols, protocols of MAC sub layer. f) Illustrate the concept of IP address, three way handshaking and DNS. g) Compare different routing algorithms used by network layer.
V	COM0500204: Software Engineering	At the end of the course, students will be able to: a) Identify different software development processes and their challenges. b) Explain software requires specification and translate it into an implementable design, following a structured and organized process. c) Apply different software estimation metrics such as cost, effort size, staffing etc. d) Design effective use of UML, along with design strategies such as defining software e) architecture, separation of concerns and design patterns. f) Develop a system using OOP concepts
V	COM0500304: Web Technologies	At the end of the course, students will be able to: a) Define and describe the working principle of the internet and World Wide Web. b) Analyze a web page and identify its elements and attributes. c) Apply HTML and CSS in designing a website and web application. d) Implement server-side functionality using PHP and JavaScript to create interactive e) web applications. f) Develop a web project and identify its elements and attributes and build customized web sites and web applications.
V	COM0500404: Internship	Attendees of the course, students will be able to: a) Explain industry workflows, best practices, and professional ethics in a b) computing environment. c) Implement programming, debugging, or data analysis techniques in realworld projects. d) Evaluate system performance, identify inefficiencies, and suggest e) improvements. f) Develop a project or technical report showcasing applied skills and problem-solving abilities.
VI	COM0600104: Automata Theory and Languages	At the end of the course, students will be able to a) Define the concept of finite automata and language accepted by it.

		<ul style="list-style-type: none"> b) Discuss regular grammar and the properties of regular languages. c) Explain the concept of PDA and language accepted by it. d) Analyze the simplification of context free language and Normal forms of context free language. e) Formulate the concept of pumping lemma for regular language and context free language
VI	COM0600204: Cloud Computing	<p>At the end of the course, students will be able to</p> <ul style="list-style-type: none"> a) Describe client server architecture. b) Illustrate the cloud computing architecture. c) Explain about different Service Level Agreements (SLAs). d) Illustrate data management techniques and security methods used in cloud computing. e) Formulate different case studies on open source and commercial clouds
VI	COM0600504: Computer Graphics	<p>At the end of the course, students will be able to:</p> <ul style="list-style-type: none"> a) Describe basic knowledge of core concepts of computer graphics input/output b) systems. c) Explain different techniques for designing computer graphics software. d) Design and construct complex geometric models using advanced modeling techniques. e) Utilize visible surface detection algorithms to render realistic scenes. f) Apply basic illumination models to simulate lighting effects and enhance the visual realism of rendered scenes.
VI	COM0600704: PROJECT AND PRESENTATION	<p>Attendees of the course, students will be able to:</p> <ul style="list-style-type: none"> a) Students will be able to recall and recognize fundamental concepts, principles, and terminology relevant to the course. b) Students will demonstrate a comprehensive understanding of theoretical frameworks, methodologies, and models discussed in the course. c) Students will be able to apply acquired knowledge and skills to solve practical problems, analyze case studies, and develop solutions in real-world scenarios relevant to the course content. d) Students will demonstrate the ability to synthesize diverse sources of information, integrate multiple perspectives, and propose innovative solutions or designs. e) Write their findings and analysis in the form of a dissertation.