

**CO/PO**

DEPARTMENT	PROGRAMME SPECIFIC OUTCOME
<b>Department Name</b>  <b>B Sc COMPUTER SCIENCE</b>	<b>PSO1 Understand the theoretical and mathematical foundations of Computer Science</b>  <b>PSO2 Understand the concepts of system architecture, hardware, software and network configuration</b>  <b>PSO3 Acquire logical thinking and problem-solving skills to find solutions in the software domain</b>  <b>PSO4 Design, analyse and develop code-based solutions for the algorithms</b>  <b>PSO5 Address the industry demands and assimilate technical, logical and ethical skills needed for the industry</b>  <b>PSO6 Adapt to emerging trends and tackle the challenges in the software field.</b>
	PROGRAMME OUTCOME
	<b>Knowledge Acquisition:</b>  <b>PO1 Demonstrate a profound understanding of knowledge trends and their impact on the chosen discipline of study.</b>  <b>Communication, Collaboration, Inclusiveness, and Leadership:</b>  <b>PO2 Become a team player who drives positive change through effective communication, collaborative acumen, transformative leadership, and a dedication to inclusivity.</b>  <b>Professional Skills:</b>  <b>PO3 Demonstrate professional skills to navigate diverse career paths with confidence and adaptability.</b>  <b>Digital Intelligence</b>  <b>PO4 Demonstrate proficiency in varied digital and Technological tools to understand and interact with the digital world, thus effectively processing complex information.</b>

	<p><b>Scientific Awareness and Critical Thinking:</b></p> <p><b>PO5 Emerge as an innovative problem-solver and impactful mediator, applying scientific understanding and critical thinking to address challenges and advance sustainable solutions.</b></p> <p><b>Human Values, Professional Ethics, and Societal and Environmental Responsibility:</b></p> <p><b>PO6 Become a responsible leader, characterized by an unwavering commitment to human values,ethical conduct, and a fervent dedication to the well-being of society and the environment.</b></p> <p><b>Research, Innovation, and Entrepreneurship:</b></p> <p><b>PO7 Emerge as a researcher and entrepreneurial leader, forging collaborative partnerships with industry, academia, and communities to contribute enduring solutions for local, regional, and global development.</b></p>
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<b>Programme : BSc Computer Science Honours programme</b>		
<b>COURSE CODE &amp; COURSE NAME</b>	<b>CSC1CJ101/CSC1MN100 Course Title Fundamentals of Computers and Computational Thinking</b>	<b>COGNITIVE LEVEL</b>
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
<b>Semester 1</b>		
	CO1 Develop a foundational knowledge of computing systems, encompassing their historical development, evolutionary milestones, and the notable contributions of key figures in the field.	U
	CO2 Acquire familiarity with diverse hardware components constituting a computer system.	U

Programme : BSc Computer Science Honours programme		
COURSE CODE & COURSE NAME	CSC1CJ101/CSC1MN100  Course Title Fundamentals of Computers and Computational Thinking	COGNITIVE LEVEL
	CO3 Gain practical expertise by engaging in hands-	AP
	CO4 Explore the spectrum of software types, and actively participate in the partitioning, installation, and configuration of operating systems to cultivate a comprehensive understanding of software systems.	AP
	CO5 Develop a foundational understanding of computer science as a discipline, examining problems through the lens of computational thinking and cultivating analytical skills to address challenges in the field.	AN
	CO6 Represent complex problems using algorithmic approaches and enhance problem-solving skills by visualizing solutions through the utilization of various software tools.	AP

<b>Programme : BSc Computer Science Honours programme</b>		
COURSE CODE	CSC1CJ101/CSC1MN100	COGNITIVE LEVEL
Course Title	Fundamentals of Computers and Computational Thinking	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
<b>Semester 2</b>		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Remember the program structure of C with its syntax and semantics	U
	CO2 Use the various constructs of a programming language viz. conditional, iteration and recursion.	AP
	CO3 Implement the algorithms in C language.	AP
	CO4 Use simple data structure like array in solving problems.	AP
	C04 Handling pointers and memory management functions in C.	AP
	CO5 Develop efficient programs for solving a problem.	AP

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC3CJ201	COGNITIVE LEVEL
Course Title	Course Title Software Project Management	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 3		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Define and explain the fundamental concepts, principles, and terminologies related to software project management. Differentiate between various software engineering process models. Understand the agile principle and methodologies and appreciate the need for iterative approaches to software Development	U
	CO2 Master various design concepts used during project development life cycle.	P
	CO3 Master various SPM techniques	P
	CO4 Develop project plans, Create project schedules using tools like Gantt charts and network diagrams	C
	C05 Understand the importance of quality in software development by mastering quality assurance processes, methodologies, and testing strategies.	P
	Prepare and deliver effective project presentations.	P

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC3CJ202/CSC3MN200	COGNITIVE LEVEL
Course Title	Data Structures and Algorithm	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
<b>Semester 3</b>		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Differentiate basic data structures (arrays, linked lists, stacks, queues) based on their characteristics, operations, and real-world applications.	U
	CO2 Perform basic operations (e.g., insertion, deletion, search) on fundamental data structures using a chosen programming language.	AP
	CO3 Identify the properties and applications of advanced data structures (trees, graphs).	AP
	CO4 Investigate the properties of various searching and sorting Techniques	U
	C05 Demonstrate critical thinking and problem-solving skills by applying data structures and algorithms to address complex computational challenges..	AP
	CO6 Implement and analyse different data structure algorithms(to solve practical problems.	AP

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC4CJ203	COGNITIVE LEVEL
Course Title	Database Management System	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 4		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 A comprehensive understanding of fundamental concepts in database management systems and its application	U
	CO2 Understand concepts of Relational Data Model and Normalization Techniques	U
	CO3 Apply principles of entity-relationship modeling and normalization techniques to design efficient and well-structured databases that meet specified requirements.	AP
	CO4 Acquire expertise in crafting and executing SQL queries for the retrieval, updating, and manipulation of data, showcasing adept skills in database querying and data manipulation	AP
	C05 Comprehend and apply strategies for managing transactions and implementing mechanisms for controlling concurrency, ensuring the database's consistency and reliability in environments with multiple users.	AP
	CO6 Explore and analyze recent trends in database management systems, with a focus on unstructured databases, NoSQL technologies	AN

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC3CJ204	COGNITIVE LEVEL
Course Title	Course Title Python Programming	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 4		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Understand the basic concepts of Python programming language.	U
	CO2 Apply problem-solving skills using the basic constructs in Python programming	AP
	CO3 Apply modular programming using functions in Python	AP
	CO4 Analyse the various data structures and operations on it using Python	AN
	CO5 Apply various packages available in Python	AP
	CO6 Apply visualization tools in Python	AP



Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC4CJ205	COGNITIVE LEVEL
Course Title	Course Title Computer Networks	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 4		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 To understand the fundamentals of computer networks including concepts like data communication ,network topologies and the reference models.	U
	CO2 Proficiency in Transmission Media and Multiplexing Techniques:	A
	CO3 To familiarise with the common networking protocols and standards	U
	CO4 Describe ,analyse and compare different data link, network and transport layer protocols	A,E
	C05 Design/implement data link and network layer protocols in simulated networking environment	AP
	CO6 To understand the need of various Application layer protocols	U

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC5CJ301	COGNITIVE LEVEL
Course Title	Course Title Data Mining	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
<b>Semester 5</b>		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Understand the fundamental concepts and principles of data mining..	U
	CO2 Demonstrate proficiency in preprocessing techniques such as cleaning, transformation, and reduction of data.:	U
	CO3 Understand popular data mining algorithms and models, such as decision trees, k-means clustering, and association rule algorithms.	U
	CO4 Explore various methods to Evaluate and interpret the results of data mining models using appropriate performance metrics.	U
	C05 Understand the role of data mining in extracting patterns and knowledge from large datasets.	U
	CO6 Apply data mining techniques to real-world problems and datasets, emphasizing practical applications in various domains	AP

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC5CJ302	COGNITIVE LEVEL
Course Title	Course Title Object Oriented Programming (Java)	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 5		
<b>Department Name</b>  <b>B Sc COMPUTER SCIENCE</b>	CO1 To understand the concepts and features of Object Oriented Programming(OOPs)	U
	CO2 To practice programming in Java	AP
	CO3 To learn java's exception handling mechanism, I/O operations and multithreading.	AP
	CO4 To learn java's O operations and multithreading.	AP
	C05 Implement programs using Java Database Connectivity.	AP
	CO6 Students will be capable of developing Graphical User Interface (GUI) applications using Swing, understanding layout management, and implementing basic event handling.	AP

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC5CJ303	COGNITIVE LEVEL
Course Title	Course Title Full Stack Web Development	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 5		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Understand the concepts to create responsive web pages using HTML and CSS	U
	CO2 Familiarization with Client-side Scripting using JavaScript	U
	CO3 Understand Node.JS and equip learners with a comprehensive understanding of NodeJS and its functionalities.	U
	CO4 Understanding and building interactive web pages using React JS.	U
	C05 Familiarization with SQL and NoSQL	AP
	CO6 Explore MongoDB and Develop real-world web applications using various technologies learned in the course	AP

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC6CJ304/ CSC8MN304	COGNITIVE LEVEL
Course Title	Course Title Digital Electronics and Computer Architecture	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 6		
<b>Department Name</b>  <b>B Sc COMPUTER SCIENCE</b>	CO1 Understand Basic Binary arithmetic Techniques	U
	CO2 Implement logic operations using basic gates and Boolean algebra, design and optimise logic expressions using Karnaugh maps and design combinational logic circuits	AP
	CO3 Understand the operation of latches and flip flops and the design of sequential logic circuits	U
	CO4 Learn the basic computer organization by understanding the role of registers, buses, ALU and control unit and the concepts like parallel processing and pipelining	U
	C05 Understand how instructions represented, addressed and executed and how a microprogrammed control unit work	U
	CO6 Understand the concepts of memory and IO organization	U

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC6CJ305/ CSC8MN305	COGNITIVE LEVEL
Course Title	Course Title Principles of Operating System	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 6		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Summarize the History, Objectives and Functions of an operating system	U
	CO2 Understand process management concepts: Process Control Block, States, Scheduling, Operations, Inter process Communication	U
	CO3 Evaluate various processor scheduling strategies, algorithms	E
	CO4 Apply process synchronisation concepts for effective process management	AP
	CO5 Analyse conditions for deadlock occurrence and methods of resolving.	AN
	CO6 Describe various memory management techniques, including paging , segmentation and virtual memory	U
	CO7 Develop Shell Scripts using Linux	C

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC6CJ306/ CSC8MN306	COGNITIVE LEVEL
Course Title	Course Title Introduction to Artificial Intelligence & Machine Learning	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 6		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Differentiate various knowledge representation methods, AI operations, Machine learning approaches and real-world applications.	U
	CO2 Master Problem-Solving Techniques (search algorithms, heuristic approaches, and informed search strategies). Analyse and evaluate its efficiency.	AP
	CO3 Investigate the properties and applications of various machine learning techniques	AP
	CO4 Evaluate Artificial Intelligence Search algorithms and Machine learning approaches' efficiency.	U
	CO5 Implement and analyse Machine learning algorithms to solve practical problems.	AP
	CO6 Apply Concepts in Real-World Projects	AP

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC7CJ401	COGNITIVE LEVEL
Course Title	Course Title Theory of Computation	

Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
<b>Semester 7</b>		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 To learn and understand fundamental concepts in computational theory, including computational models such as finite automata, pushdown automata, and Turing machines.	P
	CO2 To be able to classify formal language into regular, context-free, context sensitive and unrestricted languages.	P
	CO3 To design and analyse Turing machines, their capabilities and limitations	P
	CO4 Construct the abstract machines including finite automata, pushdown automata, and Turing machines from their associated languages and grammar	P
	CO5 Gain insights into decidability and undecidability, and understand the limitations of computation through the study of the problem and other undecidable problems..	P
	CO6 Solve computational problems regarding their computability and complexity and prove the basic results of the theory of computation	P
<b>Programme : BSc Computer Science Honours programme</b>		
COURSE CODE	CSC7CJ402	COGNITIVE LEVEL
Course Title	Course Title System Security	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
<b>Semester 7</b>		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Understand the different types of securities in information and computer systems, security goals and confidentiality, integrity, availability	U



	CO2 Outline computer system threats and various types of system attacks	U
	CO3 Identify different issues associated with system attacks and how attacking occurs and various types of attackers	U
	CO4 Provide knowledge in operating system security, file protections, security assurance	U
	CO5 Understand important elements of Database security	U
	CO6 Define security planning, various types of security policies and risk analysis	U

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC7CJ403	COGNITIVE LEVEL
Course Title	Course Title Advanced Data Structures and algorithms	
	Type of Course Major	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 7		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Understand the concepts of advanced data structures like tree, graphs, heaps.	U
	CO2 Understand familiarity with algorithmic techniques such as brute force, greedy, and divide and conquer.	U
	CO3 Understand Asymptotic analysis (big-O notation, time and space complexity).	U
	CO4 Application of advanced abstract data type (ADT) and data structures in solving real world problems.	AP
	C05 Effectively combine fundamental data structures and algorithmic techniques in building a complete algorithmic solution to a given problem	AP
	CO6 Apply Concepts of data structures in real world problem solving	AP

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC7CJ404	COGNITIVE LEVEL
Course Title	Course Title Blockchain Technology	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 7		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Understand the basics of cryptographic building blocks in blockchain technology.	U
	CO2 Explain the fundamental concepts of blockchain technology.	U
	CO3 Summarize the classification of consensus algorithms	U
	CO4 Explain the concepts of first decentralized cryptocurrency bitcoin.	U
	C05 Describe the use of smart contracts and its use cases	U
	CO6 Develop simple block chain applications	U

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC7CJ405	COGNITIVE LEVEL
Course Title	Course Title Internet of Things	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 7		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Understanding the concepts and architecture of IoT involves grasping the fundamental principles and interconnected structures of its diverse components.	U
	CO2 Understanding the hardware components of IoT involves recognizing sensors, actuators, communication modules, and processing units, crucial for data collection, transmission, and analysis.	U
	CO3 Explain the design principles for connected devices, focusing on IoT system layers and standardization. Communication technologies, data enrichment, and device management at gateways	U
	CO4 Perceive the basic protocols in IoT, that enable efficient communication between devices, facilitating data exchange and interoperability within IoT networks..	AP
	C05 Demonstrating IoT utilizes popular hardware and software platforms showcasing practical implementations of	AP

	interconnected devices.	
	CO6 Implementing IoT in real-time situations by deploying interconnected devices to collect, process, act upon data and visualize them..	AP

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC8CJ406	COGNITIVE LEVEL
Course Title	Course Title Compiler Design	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 8		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 To identify different phases in compilation process and model a lexical analyser.	AP
	CO2 To model language syntax using Context Free Grammar and develop parse tree representation using leftmost and rightmost derivations.	AP
	CO3 To compare different types of parsers and construct parser for a given grammar.	AP
	CO4 To build Syntax Directed Translation for a context free grammar, compare various storage allocation strategies and classify intermediate representations.	AP
	C05 Students will demonstrate the ability to design and implement lexical analyzers to recognize tokens in source programs.	AP
	CO6 Illustrate code optimization and code generation techniques in compilation	AP

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC8CJ407	COGNITIVE LEVEL
Course Title	Course Title Client Server Architecture	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 8		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Understand the basics of client/server systems and the driving force behind the development of client/server systems.	U
	CO2 Outline the architecture and classifications of client/server systems	U
	CO3 Choose the appropriate client/server network services for a typical application	U
	CO4 Describe management services.	U
	C05 Describe issues in network	U
	CO6 Apply various services and support	U

Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC8CJ408	COGNITIVE LEVEL
Course Title	Course Title Parallel Computing	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 8		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Summarize the key parallel computational models	U
	CO2 Appreciate and apply parallel and distributed algorithms in problem Solving	U
	CO3 Appreciate the communication models for parallel algorithm development	U
	CO4 Develop parallel algorithms using message passing paradigm	U
	C05 Formulate parallel algorithms for shared memory architectures	U
	CO6 Understand thread management	U



Programme : BSc Computer Science Honours programme		
COURSE CODE	CSC8CJ489	COGNITIVE LEVEL
Course Title	Course Title Research Methodology	
Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - actual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)		
Semester 8		
<b>Department Name</b> <b>B Sc COMPUTER SCIENCE</b>	CO1 Understand the psychology of research which includes different perspectives and necessity of research.	U
	CO2 Apply the research knowledge to formulate a suitable problem statement by adopting different research methods and models	U
	CO3 Understand different methods of Collection, Validation and Testing of Data	U
	CO4 To understand the data processing and analysis techniques	U
	C05 Analyze the research outcome by using suitable statistical tool.	U
	CO6 To write or present a scientific report and research proposal	U