

MASTER OF COMPUTER APPLICATIONS (INTEGRATED)

PROGRAMME OUTCOMES (PO)

At the completion of the Under Post graduate programme, the student will be able to accomplish the following outcomes

PO No	Graduate Programme Outcomes
PO 1	<p>Computational Knowledge:</p> <p>Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements</p>
PO 2	<p>Problem Analysis:</p> <p>Identify, formulate, research literature, and solve <i>complex</i> computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.</p>
PO 3	<p>Design /Development of Solutions:</p> <p>Design and evaluate solutions for <i>complex</i> computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.</p>
PO 4	<p>Conduct Investigations of Complex Computing Problems:</p> <p>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.</p>
PO 5	<p>Modern Tool Usage:</p> <p>Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.</p>
PO 6	<p>Professional Ethics:</p> <p>Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.</p>

PO 7	<p>Life-long Learning:</p> <p>Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.</p>
PO 8	<p>Project management and finance:</p> <p>Demonstrate knowledge and understanding of the computing 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.</p>
PO 9	<p>Communication Efficacy:</p> <p>Communicate effectively with the computing community, and with society at large, about <i>complex</i> computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.</p>
PO10	<p>Societal and Environmental Concern:</p> <p>Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.</p>
PO 11	<p>Individual and Team Work:</p> <p>Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.</p>
PO 12	<p>Innovation and Entrepreneurship</p> <p>Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.</p>

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO No	Intended Programme Specific Outcomes
PSO-1	<p>Recent Technology</p> <p>Students will have sound theoretical knowledge and skill for analysing real life problems, design complex computing systems appropriate to its solutions with therecent technology.</p>
PSO-2	<p>Employability Skill</p> <p>After Completing this program students will have ability to pursue their careerprofessionally with ethics as an individual or as a member of a team in software industry, corporate sector, Government organization, academia, research, consultancy firm, entrepreneurship and will possess knowledge and skill for problem solving and decision making.</p>
PSO-3	<p>Management /Leadership skill and Analytical Reasoning</p> <p>After this program students will possess management and leadership skill, analytical reasoning for solving time critical problems with best professional ethical practice, environmental and social concern.</p>

Semester 1

Course	Course Outcomes
English	CO1 Define and identify various methods to develop communication skills.
	CO2 Discuss and describe the strategies to improve listening, speaking, reading, and writing skills.
	CO3 Explain the skills required for creating a formal speech and participating in group discussion.
	CO4 Classify the sounds of English and their symbols.
	CO5 Develop the ability to converse on any topic.
	CO1 Students will be able to understand the number systems and codes

<p>Digital Electronics & Microprocessors</p>	<p>CO2 Students will be able to draw basic circuits using gates AND, OR, NOT, NAND,NOR, XOR etc.</p> <p>CO3 Students will be able to understand the working of basic combinational circuits and sequential circuits</p> <p>CO4 Students will learn the architecture, signals of 8086 processor.</p> <p>CO5 Students will be able to learn the difference between processor and controller, learn about instructions and signals of controller.</p>
<p>Statistics-I</p>	<p>CO1 Students will be able to understand and reproduce the core concepts of Statistics.</p> <p>CO2 Students will be able to understand the concepts related to basic ideas in Statistics.</p> <p>CO3 Students will be able to apply mathematical formulae to find the values in Statistics.</p> <p>CO4 Students will have the ability to create a mathematical model from the real life problems.</p> <p>CO5 Students will be able to evaluate different parameters in Statistics.</p>
<p>Introduction to Computers & PC hardware</p>	<p>CO1 Students will be able to understand and identify computer hardware and peripheral devices</p> <p>CO2 Students will be able to explain the function of the system components, including CPU, motherboard and system unit</p> <p>CO3 Students will be able to diagnose and troubleshoot computer systems hardware and software, and other peripheral equipment</p> <p>CO4 Students will have the ability to identify types and characteristics of various peripherals, including storage and I/O</p> <p>CO5 Students will be able to explain the purpose of preventive maintenance and identify the elements of the troubleshooting process and install an operating system.</p>
<p>Programming Methodology & C Programming</p>	<p>CO1 Students will be able to list the different datatypes, operators, statements, pre-defined functions in C</p> <p>CO2 Students will be able explain the usage of different program elements in C.</p>

	<p>CO3 Students will be able to develop modular programs using the various C programming constructs.</p> <p>CO4 Students will have the ability to write algorithms/ flowcharts / programs to Solve problems of varied nature.</p> <p>CO5 Students will be able compare the different memory allocation mechanisms and elaborate how they help to create efficient solutions to problems.</p>
<p>PC HARDWARE PRACTICALS</p>	<p>CO1 Students will be able to Identify the components of standard desktop personal computers and identify fundamental components and functions of personal computer operating systems.</p> <p>CO2 Students will be able to understand the difference between an operating system and an application program, and what each is used for in a computer.</p> <p>CO3 Students will be able to Install and configure system components and Operating system with device Drivers.</p> <p>CO4 Students will have the ability to assemble the fundamental hardware components that make up a computer's hardware to form a working computer.</p> <p>CO5 Students will be able Maintain and troubleshoot peripheral components. Troubleshoot system components.</p>
<p>C Practicals</p>	<p>CO1 Students will be able to show the representation of data structures such as arrays, structures, unions.</p> <p>CO2 Students will be able to explain the syntax and semantics of different programming constructs in C.</p> <p>CO3 Students will be able to apply modular programming concepts to develop reusable program elements.</p> <p>CO4 Students will have the ability to solve problems of varying natures using different program constructs.</p> <p>CO5 Students will be able analyze problems encountered in everyday life, decide on the functionality required to solve it and create efficient solutions to problems.</p>

Semester 2

Course	Course Outcomes
<p align="center">Fundamentals of Accounting</p>	<p>CO1 Students will be able to know about the need and importance of accounting.</p> <p>CO2 Students will be able to understand the different types of accounting systems.</p> <p>CO3 Students will be able to apply the rules of accounting system to prepare the books of accounts.</p> <p>CO4 Students will be able to construct Final Accounts from the business transaction.</p> <p>CO5 Students will be able to evaluate the business position of the organizations from their financial statements.</p>
<p align="center">Probability And Statistics</p>	<p>CO1 Students will be able to understand and reproduce the core concepts of probability.</p> <p>CO2 Students will be able to understand the concepts related to basic ideas in probability, sampling and testing.</p> <p>CO3 Students will be able to apply mathematical formulae to find the values in probability.</p> <p>CO4 Students will have the ability to create a statistical model from the real-life problems</p> <p>CO5 Students will be able to evaluate the probability of an event.</p>
<p align="center">Computer Organization And Architecture</p>	<p>CO1 Students will be able to define the fundamental concepts of computers organization.</p> <p>CO2 Students will be able to understand the theory and architecture of computer and its fundamental parts including parallel processing and pipelining.</p> <p>CO3 Students will be able to determine the coordination and the role of different components in the computer for a program execution</p> <p>CO4 Students will be able to analyze and compare some of the design issues in terms of speed, technology, cost, performance.</p>

	<p>CO5 Students will be able to evaluate the enhancement in the performance of computer by incorporating new concepts and technological developments</p>
<p>Data Structures- C</p>	<p>CO1 Students will be able to list the different types of data structures in C.</p> <p>CO2 Students will be able to describe and explain the different data structures and their operations.</p> <p>CO3 Students will be able to apply the data structures concepts learned to solve various real- world problems.</p> <p>CO4 Students will have the ability to design algorithms for manipulating various data structures</p> <p>CO5 Students will be able to analyze the different sorting and searching techniques.</p>
<p>Object Oriented Programming with C++</p>	<p>CO1 Students will be able to list and define the basic concepts of object-oriented programming</p> <p>CO2 Students will be able to explain the usage of different program elements in C++.</p> <p>CO3 Students will be able to apply the concepts learned and generate fault tolerant code.</p> <p>CO4 Students will be able to write programs by applying the various oops concepts.</p> <p>CO5 Students will be able to analyze real world problems and create extensible, reusable code.</p>
<p>Data Structures- C Practicals</p>	<p>CO1 Students will be able to represent data in various formats including an array, linked list, trees etc.</p> <p>CO2 Students will be able to describe various data structures along with how to manipulate them.</p> <p>CO3 Students will be able to solve various real-world problems by applying the data structure concepts.</p> <p>CO4 Students will be able to write programs to show the working of various data structures</p>

	<p>CO5 Students will be able to analyze and simulate various sorting and searching techniques</p>
C++ Practicals	<p>CO1 Students will be able to define the basic program elements of C++ programming language.</p> <p>CO2 Students will be able to explain the different concepts of oops incorporated in a program.</p> <p>CO3 Students will be able to apply object-oriented programming concepts to develop reusable program elements.</p> <p>CO4 Students will be able to solve problems of varying natures using different program constructs.</p> <p>CO5 Students will be able to analyze problems encountered in everyday life, decide on the functionality required and create programs to solve it.</p>

Semester 3

Course	Course Outcomes
Mathematical Foundation of Computer Science	<p>CO1 Students will be able to define the important terms used in the various topics included in the course</p> <p>CO2 Students will be able to demonstrate an understanding of relations and functions and be able to determine their properties, compositions and inverses.</p> <p>CO3 Students will be able to apply the operations of Sets, rules of inference graph theory and trees to solve applied problems.</p> <p>CO4 Students will have the ability to create a mathematical model of a real-world problem using the concepts of Sets or Graphs.</p> <p>CO5 Students will have the ability to evaluate a real world problem using the concepts of Sets or Graphs.</p>

<p>Management Information Systems</p>	<p>CO1 Identify technologies and their applications</p> <p>CO2 Systems approach and application of technology</p> <p>CO3 Levels of decision making and choosing and building a design of the appropriate information system.</p> <p>CO4 Various levels of management and their role in decision making process.</p> <p>CO5 Design a structure of an information system based on the problem.</p>
<p>DBMS and NoSql</p>	<p>CO1 Students will be able to define the architecture and functioning of Database Management Systems. They can also describes how aggregates manifest themselves in data models in NoSQL</p> <p>CO2 Students will be able to illustrate the techniques for controlling the consequences of concurrent data access and crash recovery.</p> <p>CO3 Students will be able to apply normalization techniques to develop a good database design.</p> <p>CO4 Students will have the ability to create and maintain a relational database using SQL and its advanced features.</p> <p>CO5 Students will be able to summarize different applications of DBMS.</p>
<p>Principles of Management</p>	<p>CO1 Students will be able to know about the guiding principles and theories of Management</p> <p>CO2 Students will be able to understand the core functions of Management. Students will be able to apply the stages of recruitment in different organization.</p> <p>CO3 Students will be able to customize & suggest appropriate performance appraisal system for the organisation.</p> <p>CO4 Students will be able to evaluate the pros and cons of applying various marketing strategies.</p>
<p>Visual Programming (C#.NET)</p>	<p>CO1 Students will be able to list all the tools and features of visual studio framework.</p>

	<p>CO2 Students will be competent to use the visual studio framework and ms sql database.</p> <p>CO3 Students will be able to justify the usage of different tools to create windows-based applications.</p> <p>CO4 Students will be able to design and develop applications with database connectivity by the use of C#.net language.</p> <p>CO5 Students will be able to test and maintain the applications created in visual studio framework with MS SQL as data base.</p>
<p align="center">DBMS Practical (ORACLE & Mongodb)</p>	<p>CO1 Students will be able to understand the working of DBMS.</p> <p>CO2 Students will be able to Create and alter table structures using ORACLE. Students will be able to Build subqueries to extract rows from processed data.</p> <p>CO3 Students will be able to formulate queries to perform Insert, update and delete, select and rollback operations in a database.</p> <p>CO4 Students will be able to create and manipulate collections in Mongodb and perform various operations.</p>
<p align="center">Visual Programming Practicals</p>	<p>CO1 Students will be familiar with all the tools and features of visual studio framework.</p> <p>CO2 Students will be competent to use the visual studio framework and ms sql database.</p> <p>CO3 Students will be able to justify the usage of different tools to create windows-based applications and also in-depth knowledge about MS SQL Database.</p> <p>CO4 Students will be able to design and develop applications with database connectivity by the use of C#.net language.</p> <p>CO5 Students will be able to test and maintain the applications created in visual studio framework with MS SQL as data base.</p>

Semester 4

Course	Course Outcomes
<p align="center">Technical Communication</p>	<p>CO1 Students will be able to understand the dynamics of communication in the technical world.</p> <p>CO2 Students will be able to apply grammatically accurate sentences.</p> <p>CO3 Students will be able to develop corporate skills needed for employment in the industry.</p> <p>CO4 Students will be able to explain events, processes, and situations students will be able to create a job application along with CV.</p>
<p align="center">JAVA</p>	<p>CO1 Students will be able Define the basic fundamentals of JAVA</p> <p>CO2 Students will be able to Differentiate between C , C++ , JAVA</p> <p>CO3 Students will be able to Apply Oops concepts in JAVA</p> <p>CO4 Students will be able to Create GUI application using JAVA SWING and establish database connection using JDBC</p> <p>CO5 Students will be able to explain the concept of multiple inheritance using interfaces</p>
<p align="center">Client Server Computing</p>	<p>CO1 Students will be able to define the underlying concepts in client server development using common access databases</p> <p>CO2 Students will be able to examine the techniques which are required to develop network application/ internet based application.</p> <p>CO3 Students will be able to differentiate between two-tier and three-tier architectures.</p> <p>CO4 Students will be able to design and Set up a client /server environment using LAN and WAN Scenarios.</p> <p>CO5 Students will be able to analyze the concept of middleware, and communication protocols. Needs</p>

<p>Parallel Processing</p>	<p>CO1 Students will be able to list all terminology commonly used in parallel computing</p> <p>CO2 Students will become familiar with different parallel architectures</p> <p>CO3 Students will be able to justify the use of parallel processing algorithms</p> <p>CO4 Students will be able to design parallel systems</p> <p>CO5 Students will be able to analyze the different parallel processing architectures</p>
<p>Enterprise Resource Planning</p>	<p>CO1 Understand the fundamental concepts of ERP systems.</p> <p>CO2 Understand the Technologies used and Business modules of ERP systems.</p> <p>CO3 To Learn about different implementation phases of ERP Software solutions</p> <p>CO4 To Learn about post implementation process of ERP Software solutions Understand emerging and trends in ERP Systems through various case studies related to ERP Systems.</p>
<p>System Software</p>	<p>CO1 Students will be able to understand Finite state automata, DFA, N DFA, loaders, linkers, macroprocessors.</p> <p>CO2 Students will be able to know structure of assemblers in detail.</p> <p>CO3 Students will be able to apply data structures into design of various types of system software components.</p> <p>CO4 Students will be able to analyze algorithms to fine tune them.</p> <p>CO5 Students will be able to design a editor</p>
<p>E-Commerce</p>	<p>CO1 Students will have knowledge on E-commerce, business models, revenue models, technologies related to e-commerce, EDI, EFTS and other technical terms.</p> <p>CO2 Students will have knowledge on Ecommerce revolution and its impact in business, design methodology of</p>

	<p>website, factors to be considered in design, security and promotional aspects.</p> <p>CO3 How to evaluate various aspects of a e-commerce site. Copyright intellectual property rights etc.</p> <p>CO4 Students will have knowledge on various available technologies and structures available. List the advantages and disadvantages of having business on the web. Traditional vs. modern business models. Security approaches etc.</p> <p>CO5 Students will have knowledge on the various methods to design evaluate and test a e- commerce website.</p> <p>CO6 Students will have knowledge on a list of factors which would help an organization to design and host a efficient and effective website and also evaluate the performance of the website with adequate security measures.</p>
<p>JAVA Practicals</p>	<p>CO1 Students will be able to define the basic fundamentals of JAVA</p> <p>CO2 Students will be able to differentiate between C , C++ , JAVA</p> <p>CO3 Students will be able to apply Oops concepts in JAVA</p> <p>CO4 Students will be able to develop GUI application using JAVA SWING and establish database connection using JDBC</p> <p>CO5 Students will be able to explain the concept of multiple inheritance using Interfaces</p>
<p>RDBMS Practicals</p>	<p>CO1 Design and implement a database schema for a given problem-domain</p> <p>CO2 Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS</p> <p>CO3 Create a normalized database.</p> <p>CO4 Design PL/SQL block Implement ODBC techniques.</p>

Semester 5

Course	Course Outcomes
Operations Research	<p>CO1 Students will be able to understand and reproduce the core concepts of optimization and also queuing theory.</p> <p>CO2 Students will be able to understand the how a real world problem is related to LPP.</p> <p>CO3 Students will be able to apply mathematical formulae to find the optimum values.</p> <p>CO4 Students will have the ability to create a mathematical model from a real life problem.</p> <p>CO5 Students will be able to evaluate optimum values.</p>
Operating Systems	<p>CO1 Students will be able to understand and reproduce the concepts of Operating System.</p> <p>CO2 Students will be able to develop the applications to run in parallel either using process or thread models of different OS</p> <p>CO3 Students will be able to apply various device and resource management techniques for timesharing and distributed systems, Mutual exclusion, Deadlock detection and agreement protocols of Distributed OS.</p> <p>CO4 Students will have the ability to Interpret the mechanisms adopted for file sharing in distributed Applications.</p> <p>CO5 Students will have the ability to conceptualize the components involved in designing a contemporary OS</p>
Web Technology	<p>CO1 Define the web programming concepts.</p> <p>CO2 Students will be able to develop and explain the concepts related to web programming.</p> <p>CO3 Students will be able to apply programming logic by implementing information to develop web applications.</p> <p>CO4 Students have the ability to compare and test different web technologies.</p> <p>CO5 Students will be able to develop and construct applications based on different web technologies.</p>

<p>Object oriented Modeling & Design</p>	<p>CO1 Define basic concepts, terms and principles of object-oriented analysis and design</p> <p>CO2 Explain basic structure, behavior and architecture of modeling.</p> <p>CO3 Illustrate the use of UML for object-oriented modeling.</p> <p>CO4 Model an overall system using UML diagrams.</p> <p>CO5 Evaluate various system development methodologies.</p>
<p>Software Engineering And Project Management</p>	<p>CO1 Students will be able to understand various software development techniques and methodologies</p> <p>CO2 Students will be able to choose appropriate process model depending on the user requirements</p> <p>CO3 Students will be able to Translate a requirement specification to a design using an appropriate software engineering methodology.</p> <p>CO4 Students will be able to formulate appropriate testing strategy for the given software system</p> <p>CO5 Students will be able to develop software projects based on current technology, by managing resources economically and keeping ethical values.</p>
<p>Python Programming Practicals</p>	<p>CO1 Students will be able to identify the commonly used operations involving file systems and regular expressions.</p> <p>CO2 Students will be able to articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python.</p> <p>CO3 Students will be able to apply a solution clearly and accurately in a program using Python.</p> <p>CO4 Students will have the ability to determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets</p> <p>CO5 Students will have the ability to demonstrate web application using python web Framework- Django</p>



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Web Technology Practicals

CO1 Students will be able to define the web programming concepts.

CO2 Students will be able to develop and explain web programming.

CO3 Students will be able to apply programming logic to develop web applications.

CO4 Students have the ability to examine and test different web technologies.

CO5 Students will be able to design and construct applications based on different web technologies.

Semester 6

Course	Course Outcomes
<p align="center">Research Methodology</p>	<p>CO1 Students will be able to understand basic concepts of research and the framework of research</p> <p>CO2 Students will be able to solve the research problem by analyzing the data analyze data.</p> <p>CO3 Students will be able to define how the ethical dimensions of research will conduct.</p> <p>CO4 Students will have the ability to create a problem statement from a real-life problem.</p> <p>CO5 Students will be able to organize and conduct research in an appropriate manner and appreciate the components of scholarly writing.</p>
<p align="center">Data Communications</p>	<p>CO1 Students will be able to understand and explain Data Communications System and its</p> <p>CO2 Students will be able to explain the process of data communication.</p> <p>CO3 Students will be able to familiarize with the basic taxonomy and terminology of the data communication area.</p> <p>CO4 Students will have the ability to select appropriate data communications solutions to business problems and needs.</p> <p>CO5 Students will be able to summarize different application of data communications and multiplexing techniques.</p>
<p align="center">Android Programming</p>	<p>CO1 Students will be able understand functionality and purpose of different android tools</p> <p>CO2 Students will learn to design graphical user interface part.</p> <p>CO3 Students will be able to make decision to solve a problem using package, library and threads.</p> <p>CO4 Students will be able to apply the concepts to create small application in form of apps.</p>

	<p>CO5 Students will be able to design and develop various kinds of apps.</p>
<p>Real Time Operating System</p>	<p>CO1 Students will be able to identify the need to create the special purpose operating system.</p> <p>CO2 Students will be able to describe the fundamental concepts of RTOS Students will be able to apply Scheduling techniques</p> <p>CO3 Students will be able to develop programs for real time services, firmware and RTOS.</p> <p>CO4 Students will be able to evaluate the requirement for task synchronization and coordination handled by operating system</p>
<p>Distributed Processing</p>	<p>CO1 List the basic concepts of distributed processing and their features.</p> <p>CO2 Explain about the main ideas of distributed processing.</p> <p>CO3 Apply the various techniques available in distributed processing.</p> <p>CO4 Differentiate the sub features, explaining its role in distributed processing</p> <p>CO5 Evaluate the various technologies available in distributed processing.</p>
<p>Embedded System Design</p>	<p>CO1 Students will be able to explain the fundamentals of embedded system design</p> <p>CO2 Students will be able to analyze the development and execution environment of embedded systems</p> <p>CO3 Students will be able to compare different design methodologies and tools applied to embedded systems</p> <p>CO4 Students will be able to evaluate the requirements of programming Embedded Systems, related software architectures and tool chain for Embedded Systems.</p> <p>CO5 Students will be able to evaluate the differences between the general computing system and the embedded system, also recognize the classification of embedded systems.</p>

Semester 7

Course	Course Outcomes
Linux OS and Shell Programming	<p>O1 Students will be able to recall the concepts of operating systems, Linux file handling commands,</p> <p>O2 Students will be able to describe management of Linux administration, concepts of users, groups and super user. Commands for carrying out various OS tasks.</p> <p>O3 Students will be able to write shell scripts to help make administration work simple and efficient.</p> <p>O4 Students will be able to Install software, take backup and restore.</p> <p>O5 Students will be able to analyze performance monitoring of Linux installation.</p> <p>O6 Students will be able to install a Linux OS instance and configure it to meet the requirements.</p>
Analysis & Design of Algorithms	<p>O1 Students will be able to define basic concepts in Analysis and Design of algorithm.</p> <p>O2 Students will be able to explain various algorithms and give examples for each category.</p> <p>O3 Students will be able to illustrate NP-Hard and NP-complete problems</p> <p>O4 Students will have the ability to compare the performance of different algorithms algorithm.</p> <p>O5 Students will be able to evaluate the efficiency of algorithms using time and space complexity theory.</p>
Data Mining And Ware housing	<p>O1 Students will be able to understand functionality of the various data mining and data warehousing.</p> <p>O2 Students will learn the strengths and limitations of various data mining and data warehousing models.</p> <p>O3 Students will be able to analyze different techniques of various data clustering .</p>

	<p>O4 Students will be able to compare different approaches of data ware housing and data mining with various technologies.</p> <p>O5 Students will be able to create research interest towards advances in Data Mining.</p>
Cryptography	<p>O1 Students will be able to understand cryptography and blockchain concepts and application</p> <p>O2 Students will be able to know how to apply security principles to system design</p> <p>O3 Students will be able to know Various network security applications, Firewall, IDS, Malicious softwares</p> <p>O4 Students will be in a position to create real time application of the cryptography by consider the symmetric asymmetric method</p>
Computer Networks	<p>O1 Students will be able to understand and describe the layered protocol model</p> <p>O2 Students will be able to describe, analyse and evaluate various related technical, administrative and social aspects of specific computer network protocols from standards documents.</p> <p>O3 Students will be able to design, analyse, and evaluate networks and services for homes, data centres, IoT/IoE, LANs and WANs</p> <p>O4 Students will have the ability to specify and identify deficiencies in existing protocols, and then go onto formulate new and better protocols</p> <p>O5 Students will have a working knowledge of datagram and internet socket programming</p>
PHP Programming Practicals	<p>O1 Students will be able define the basic fundamentals of PHP</p> <p>O2 Students will be able to differentiate between client-side validation and server-side validation</p> <p>O3 Students will be able to apply Oops concepts in PHP</p> <p>O4 Students will be able to create database and establish connection using PHP</p>

	<p>O5 Students will be able to explain sessions and cookies used in PHP</p>
<p>Linux OS and Shell Programming Practicals</p>	<p>CO1 Students will be able to understand Linux commands and shell script structure</p> <p>CO2 Students will be able to describe organization and functioning. Purpose of administration, process management.</p> <p>CO3 Students will be able to develop shell script, take backups, restoration configure a Linux installation.</p> <p>CO4 Students will learn how Linux can be implemented effectively in comparison with other platforms.</p> <p>CO5 Students will learn to create a networked environment using Linux platform.</p>

Semester 8

Course	Course Outcomes
<p>Employability Skills</p>	<p>CO1 Students will be able to understand all aspects communication and its effect on giving and receiving information.</p> <p>CO2 Students will be able to equip students to effectively tackle the interview process, leaving a positive impression with the prospective employer</p> <p>CO3 Students will be able to articulate the importance of self-preparation.</p> <p>CO4 Students will be able to help students enhance their Technical skills on interview basis.</p> <p>CO5 Students will be able to solve Quantitative, Verbal and Logical Reasoning and Comprehension problems in IT recruitment drives and other competitive exams.</p>
<p>Artificial Intelligence</p>	<p>CO1 Students will be able to know about the AI techniques and application area and be aware of knowledge representations.</p> <p>CO2 Students will be able to understand the basic theory of problem-solving paradigms</p>

	<p>CO3 Students will be able to enumerate the Knowledge representation using Rule based Algorithms and Reasoning</p> <p>CO4 Students will be able to create logical instructions using propositional logic.</p> <p>CO5 Students will be able to evaluate the possibility of AI applications like Natural language processing, Expert systems in various problem domains of the real world.</p>
Internet Technology And Applications	<p>CO1 Students will be able to recall the basic concepts and applications of the Internet and World Wide Web.</p> <p>CO2 Students will be able to apply relevant Internet knowledge to enhance their understanding of other networking situations.</p> <p>CO3 Students will be able to use current Internet Technology necessary for daily life application.</p> <p>CO4 Students will be able to understand the concepts like Email architecture DNS server and Multimedia services.</p> <p>CO5 Students will be able to compare various Network Protocols like TCP, UDP,FTP,HTTP.SMTP</p>
Compiler Design	<p>CO1 Students will be able explain different phases and various techniques used for the implementation of a compiler</p> <p>CO2 Students will be able to interpret a scanner, parser, and semantic analyser without the aid of automatic generators</p> <p>CO3 Students will be able to differentiate the lexical, syntactic and semantic analysis into meaningful phases for a compiler to undertake language translation</p> <p>CO4 Students will be able to design the structures and support required for compiling advanced language features.</p> <p>CO5 Students will be able to evaluate various techniques used for the implementation of a compiler</p>
Social Network Analysis	<p>CO1 Understand how to apply node and group level social network measures.</p>

	<p>CO2 Collect network data in different ways while adhering to legal standards and ethics standard.</p> <p>CO3 Mine the behaviour of the users in the social network</p> <p>CO4 Predict the possible next outcome of the social network</p> <p>CO5 Plan and execute network analytical computations.</p>
<p>Knowledge Management and Business Intelligence</p>	<p>CO1 Students will be able to understand about Knowledge management concepts</p> <p>CO2 Students will become familiar with different Business intelligence techniques</p> <p>CO3 Students will be able to justify the use of intelligence Techniques.</p> <p>CO4 Students will be able to design Business Intelligence systems.</p> <p>CO5 Students will be able to analyze the different uses of knowledge management systems.</p>
<p>Foundation of Cloud Computing</p>	<p>CO1 Students will be able to understand and recall the fundamental concepts of cloud computing.</p> <p>CO2 Students will be able to describe the various cloud related concepts and technologies.</p> <p>CO3 Students will be able to explore the vast ecosystem of the cloud and discover the importance of cloud related technologies</p> <p>CO4 Students will have the ability to arrange appropriate tools and applications to suit their requirements.</p> <p>CO5 Students will be able to compare the different cloud technologies, applications, and tools</p>
<p>Computer Graphics</p>	<p>CO1 Students will be able to define the fundamental concepts of computers graphics</p> <p>CO2 Students will be able to understand the use of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them..</p>

	<p>CO3 Students will be able to apply computer graphics concepts in various applications</p> <p>CO4 Students will be able to analyze the fundamentals of computer graphics including animation, underlying technologies, principles, and applications</p> <p>CO5 Students will be able to evaluate and compare the 2D and 3D concepts while applying to various applications</p>
<p>Compiler Design Practicals</p>	<p>CO1 Students will be able to describe and simulate various lexical analyzers and parsers</p> <p>CO2 Students will be able to apply different compiler writing tools to implement the different Phases</p> <p>CO3 Students will be able to analyze the data flow and control flow</p> <p>CO4 Students will be able to construct the intermediate Code representation</p> <p>CO5 Students will be able to learn the implementation of the LEX and YACC tools</p>
<p>Mini Project - Application Development</p>	<p>CO1 Students will be able to understand and solve problems in the field of computing.</p> <p>CO2 Students will be able to investigative, research and improve report writing skills.</p> <p>CO3 Students will be able to to investigate a chosen topic in considerable depth.</p> <p>CO4 Students have the ability to demonstrate the application of their programming and research skills.</p> <p>CO5 Students will be able to apply their knowledge to complex computing problems.</p>

Semester 9

Course	Course Outcomes
<p>Computational Sustainability</p>	<p>CO1 Students will be able to understand the different types of environmental pollution problems and their sustainable solutions.</p> <p>CO2 Students will have a broader perspective in thinking for sustainable practices by utilizing the knowledge and principles gained from this course</p> <p>CO3 Students will be able to work in the area of sustainability for research and education</p> <p>CO4 Students will be able to create a sustainable environment by implementing the sustainable practices they learned.</p> <p>CO5 Students will be able to identify sustainability problems and find solutions</p>
<p>Network Security with IPR</p>	<p>CO1 Students can understand the IP security</p> <p>CO2 Students can know how to secure the email</p> <p>CO3 Students can identify and investigate different Malicious software in networks</p> <p>CO4 Students can create real time application of the web Security and Email</p> <p>CO5 Students will be able to evaluate malware, web security, privacy and e-mail Security.</p>
<p>Data Science</p>	<p>CO1 Students will be able to know about the basic statistical concepts applied for data science.</p> <p>CO2 Students will be able to understand the importance and application of various Probability distribution.</p> <p>CO3 Students will be able to apply the appropriate data mining techniques for knowledge acquisition.</p> <p>CO4 Students will be able to practically implement the machine learning algorithms.</p> <p>CO5 Students will be able to judge the effectiveness of data science techniques in real time application.</p>

<p>IT Infrastructure Management</p>	<p>CO1 Define and identify various terms related to Infrastructure Management.</p> <p>CO2 Learn SLA's, Incident management, concept of building cost-effective infrastructure.</p> <p>CO3 Concept behind ITIL Analyze the technology to build and design infrastructures using ITIL for the same.</p> <p>CO4 Design a infrastructure plan.</p> <p>CO5 Evaluate terms like TCO, security and effectiveness.</p>
<p>Application Development and Maintainance</p>	<p>CO1 Student will be able to define the basics of software delivery ,deployment, testing and development.</p> <p>CO2 Students will be able to differentiate the best practices of software development.</p> <p>CO3 Students will be able to apply pragmatic programming concepts</p> <p>CO4 Students will be able to create applications using all the aspects of pragmatic programming concepts</p> <p>CO5 Students will be able to explain different concepts of continuous delivery and pragmatic projects.</p>
<p>Software Testing</p>	<p>CO1 Students will be able to define various types of testing.</p> <p>CO2 Students will be able to differentiate Whitebox Testing and Blackbox testing.</p> <p>CO3 Students will be able to apply various testing techniques for testing a Software.</p> <p>CO4 Students will be able to Create Test cases for testing a Software.</p> <p>CO5 Students will be able to explain the importance of test automation tools.</p>
<p>Customer Relationship Management</p>	<p>CO1 Understand and describe a customer relationship management application,</p> <p>CO2 Examine the techniques which are required to develop network application/ internet based application.</p>

	<p>CO3 Implement how CRM practices and technologies enhance the achievement of marketing, sales and service.</p> <p>CO4 Critically analyze an organization’s relational strategies with stakeholder groups</p> <p>CO5 Evaluate CRM implementation strategies</p>
<p>Informatics and Cyber Ethics</p>	<p>CO1 Students identify statutory, regulatory, constitutional, and organizational laws that affect the information technology professionally.</p> <p>CO2 Students locate and apply case law and common law to current legal dilemmas in the technology field.</p> <p>CO3 Students apply diverse viewpoints to ethical dilemmas in the information technology field and recommend appropriate actions.</p> <p>CO4 Students distinguish enforceable contracts from non-enforceable contracts.</p> <p>CO5 Students analyze statutory, regulatory, constitutional, and organizational laws that affect the information technology professionally.</p>
<p>Machine Learning</p>	<p>CO1 Students will be able to introduce the basic concepts and techniques of Machine Learning.</p> <p>CO2 Students will be able to to develop skills for using machine learning .</p> <p>CO3 Students will be able to apply algorithms for solving practical problems</p> <p>CO4 Students will be able to to create skills for using standard machine learning libraries.</p> <p>CO5 Students will be able to differentiate concepts of machine learning algorithms.</p>
<p>Data Science Practicals</p>	<p>CO1 Students will be able to understand the methods of data preprocessing.</p>



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	<p>CO2 Students will be able to apply different functions of R programming language for computing statistical values computing statistical compiler writing tools to implement the different Phases.</p> <p>CO3 Students will be able to analyze the data for retrieving knowledge.</p> <p>CO4 Students will be able to implement the machine learning algorithms.</p> <p>CO5 Students will be able to evaluate the validity of hypothesis by various testing methods.</p>
<p>Cloud Computing Practicals</p>	<p>CO1 Students will be able to define the web programming concepts.</p> <p>CO2 Students will be able to develop and explain web programming.</p> <p>CO3 Students will be able to apply programming logic to develop web applications.</p> <p>CO4 Students have the ability to examine and test different web technologies.</p> <p>CO5 Students will be able to design and construct applications based on different web technologies.</p>