

DEPARTMENT OF COMPUTER APPLICATIONS**CO 2009 REGULATION****I YEAR I SEM**

Subject Code	/ Subject Name	Course Outcome
MC9211	Computer Organization	<ol style="list-style-type: none">1. Able to design digital circuits by simplifying the Boolean functions2. Able to Understand the organization and working principle of computer hardware components3. Able to understand mapping between virtual and physical memory.4. Acquire knowledge about multiprocessor organization and parallel processing.5. Able to trace the execution sequence of an instruction through the processor
MC9212	Problem Solving And Programming	<ol style="list-style-type: none">1. Able to design a computational solution for a given problem.2. Able to transform a problem solution into programs involving programming constructs3. Able to break a problem into logical modules that can be solved (programmed).4. To write programs using structures, strings, arrays, pointers and files for solving complex5. Able to introduce modularity using functions and pointers which permit ad hoc run-time•computational problem. Polymorphism
MC9213	DATABASE MANAGEMENT SYSTEMS	<ol style="list-style-type: none">1. Understand the basic concepts of the database and data models.2. design a database using ER diagrams and map ER into Relations and normalize the relations3. Acquire the knowledge of query evaluation to monitor the performance of the DBMS.4. Develop a simple database applications using normalization.5. Acquire the knowledge about different special purpose databases and to critique how they differ from traditional database systems.
MC9214	DATA STRUCTURES	<ol style="list-style-type: none">1. Able to write efficient algorithm for a given problem and able to analyze its time complexity.2. Able to develop any new application with the help of data structures and algorithms.3. Able to apply the algorithm design techniques to any of the real world problem.4. Able to design their own data structure according to the application need.

		5. Able to select and apply the data structure to suit any given problem.
MC9215	Accounting and Financial Management	<ol style="list-style-type: none"> 1. Students will understand the basic aspects of accounting procedures 2. Helps the student can gain the knowledge about the outcomes of the company accounts 3. They can have complete analysis of financial statement 4. They can have the knowledge about the standard costing system 5. Students will be able have a detailed analysis about the accounting software's
MC9217	Programming and Data Structures Lab	<ol style="list-style-type: none"> 1. Be able to design and analyze the time and space efficiency of the data structure 2. Be capable to identify the appropriate data structure for given problem 3. Have practical knowledge on the applications of data structures 4. To familiarize the students with language environment. 5. To implement various concepts related to language.
MC9218	DBMS Lab	<ol style="list-style-type: none"> 1. Understand, analyze and apply common SQL statements including DDL, DML and DCL statements to perform different operations. 2. Design different views of tables for different users and to apply embedded and nested queries. 3. Design and implement a database for a given problem according to well known design principles that balance data retrieval performance with data consistency. 4. Design and implement a database schema for a given problem-domain 5. To learn and understand various Database Architectures and Applications
SEMESTER II		
MA9221	Mathematical Foundations of Computer Science	<ol style="list-style-type: none"> 1. Acquire the basic knowledge of matrix, set theory, functions and relations concepts needed for designing and solving problems. 2. Able to design and solve Boolean functions for defined problems. 3. Acquire the knowledge of logical operations and predicate calculus needed for computing skill. 4. Apply the acquired knowledge of formal languages to the engineering areas like Compiler Design. 5. Apply the acquired knowledge of finite automata theory and design discrete problems to solve by computers.
MC9222	Object Oriented Programming	<ol style="list-style-type: none"> 1. Able to understand and design the solution to a problem using object-oriented programming concepts

	<ol style="list-style-type: none"> 2. Able to demonstrate the use of virtual functions to implement polymorphism. 3. Able to use proper class protection mechanism to provide security. 4. Understand and implement the features of C++ including templates, exceptions and file handling for providing programmed solutions to complex problems 5. Able to reuse the code with extensible Class types, User-defined operators and function overloading
MC9223 Design and Analysis of Algorithms	<ol style="list-style-type: none"> 1.To analyze algorithms and to determine algorithm correctness and time efficiency class 2. Understand different algorithm design techniques (brute-force, divide and conquer, greedy, etc.) and their implementation 3.To analyze a problem and identify the computing requirements appropriate for its Solution 4. To Design, implement and test an efficient algorithmic solution for a given computational problem 5.To use most common algorithms, design techniques and data structures to solve given problem
MC9224 SYSTEM SOFTWARE	
MC9225 Operating Systems	<ol style="list-style-type: none"> 1. To learn the fundamentals of Operating Systems. 2. To learn the mechanisms of OS to handle processes and threads and their communication 3. To learn the mechanisms involved in memory management in contemporary OS 4. To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols 5. To know the components and management aspects of concurrency management
MC9227 Object Oriented Programming Lab	<ol style="list-style-type: none"> 1. To apply the concepts of data encapsulation, inheritance, and polymorphism to large-scale software 2. To be able to discuss different data structures to represent real world problems 3. To acquire the concepts of Graphical User Interfaces 4. To design and develop programs with Graphical User Interfaces capabilities 5. To be able to design various ways of algorithms to solve the problems. 6. To explain the principles of the object oriented programming paradigm specifically including

	abstraction, encapsulation, inheritance and polymorphism
MC9228 System Software Lab	
MC9229 Algorithms Lab	<ol style="list-style-type: none"> 1. define basic static and dynamic data structures and relevant standard algorithms for them: stack, queue, dynamically linked lists, trees, graphs, heap, priority queue, hash tables, sorting algorithms, min-max algorithm, 2. demonstrate advantages and disadvantages of specific algorithms and data structures, 3. select basic data structures and algorithms for autonomous realization of simple programs or program parts 4. determine and demonstrate bugs in program, recognise needed basic operations with data structures 5. formulate new solutions for programming problems or improve existing code using learned algorithms and data structures,
SEMESTER III	
MC9231 Computer Networks	<ol style="list-style-type: none"> 1. Able to trace the flow of information from one node to another node in the network. 2. Able to identify the components required to build different types of networks. 3. Able to understand the functionalities needed for data communication into layers. 4. Able to choose the required functionality at each layer for given application. 5. Able to understand the working principles of various application protocols
MC9232 Microprocessors and its Applications	<ol style="list-style-type: none"> 1. Able to design and control real time control systems. 2. Able to understand the functionality of 8085 microprocessor. 3. Able incorporate enhanced features in the embedded systems through software. 4. Able to rectify minor problems by troubleshooting 5. Acquire the knowledge of real time operating system and implement real time functions
MC9233 Software Engineering	<ol style="list-style-type: none"> 1. Get an insight into the processes of software development 2. Able to understand the problem domain for developing SRS and various models of software engineering 3. Able to Model software projects into high level design using DFD,UML diagrams

	<p>4. Able to Measure the product and process performance using various metrics</p> <p>5. Able to Evaluate the system with various testing techniques and strategies.</p>
MC9234 Computer Graphics	<ol style="list-style-type: none"> 1. To provide comprehensive introduction about computer graphics system, design algorithms and two dimensional transformations. 2. To make the students familiar with techniques of clipping, three dimensional graphics and three dimensional transformations. 3. The computer graphics course prepares students for activities involving in design, development and testing of modeling, rendering, shading and animation. 4. Have a basic understanding of the core concepts of computer graphics. 5. Understand a typical graphics pipeline. Have made pictures with their computer.
MC9235 Web Programming	<ol style="list-style-type: none"> 1. Able to understand the internet standards and recent web technologies like Conferencing, newsgroup etc. 2. Able to implement, compile, test and run Java program, 3. Able to make use of hierarchy of Java classes to provide a solution to a given set of requirements found in the Java API 4. Able to understand the components and patterns that constitute a suitable architecture for a web application using java servlets 5. Able to demonstrate systematic knowledge of backend and front end by developing an appropriate application
MC9237 Graphics Lab	<ol style="list-style-type: none"> 1. Research and determine skills needed to obtain career objective then develop work to enter that field. 2. Develop design drawings that demonstrate computer graphics and design skills. 3. Prepare technical drawings that demonstrate expertise in desired career objective 4. Create electronic files of graphic presentations for art and computer graphics and design courses. 5. Create portfolio to showcase projects and market skills.
MC9238 Microprocessor Lab	<ol style="list-style-type: none"> 1. Understand and apply the fundamentals of assembly level programming of microprocessors and microcontroller. 2. Work with standard microprocessor real time interfaces including GPIO, serial ports, digital-to-analog converters and analog-to-digital converters; 3. Troubleshoot interactions between software and hardware;

	<ol style="list-style-type: none"> 4. Analyze abstract problems and apply a combination of hardware and software to address the problem; 5. Use standard test and measurement equipment to evaluate digital interfaces.
MC9239 Web Programming Lab	<ol style="list-style-type: none"> 1. Design Web pages using HTML/DHTML and style sheets Course Outcome 2. Design and Implement database applications. Course Outcome 3. Create dynamic web pages using server side scripting Course Outcome 4. Write Client Server applications 5. Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.
SEMESTER IV	
MC9241 Network Programming	<ol style="list-style-type: none"> 1. To write socket API based programs TOTAL: 45 PERIODS 2. To design and implement client-server applications using TCP and UDP sockets 3. To analyze network programs.
MC9242 Resource Management Techniques	<ol style="list-style-type: none"> 1. Understand and apply linear, integer programming to solve operational problem with constraints. 2. Apply transportation and assignment models to find optimal solution in warehousing and Travelling, 3. To prepare project scheduling using PERT and CPM 4. Identify and analyze appropriate queuing model to reduce the waiting time in queue. 5. Able to use optimization concepts in real world problems
MC9243 Visual Programming	<ol style="list-style-type: none"> 1. Demonstrate fundamental skills in utilizing the tools of a visual environment in terms of the set of available command menus and toolbars 2. Explain and use of delegates and events for producing event-driven application 3. Implement SDI and MDI applications while using forms, dialogs, and other types of GUI components 4. Produce and use specialized new GUI components • Explain message passing mechanism between components and threads using messaging 5. Apply visual programming to software development by designing projects with menus and submenus.
MC9244 Object Oriented Analysis and Design	<ol style="list-style-type: none"> 1. Understand the basic concepts to identify state & behavior of real world objects 2. Able to learn the various object oriented methodologies and choose the appropriate one for solving the problem with the help of various case studies

	<ol style="list-style-type: none"> 3. Understand the concept of analysis, design & testing to develop a document for the project. 4. Able to implement analysis, design & testing phases in developing a software project. 5. Able to understand the testing strategies and know about automated testing tools.
MC9246 Visual Programming Lab	<ol style="list-style-type: none"> 1. Students will be able to learn visual programming basics and its components. 2. Students should gain both a conceptual understanding of specification and GUI design issues and their implementation, and hands-on experience implementing an IDE; 3. Students should be comfortable using the Java application programming interface to learn about and then to successfully and appropriately use an already-written Java class; 4. Students should have obtained experience designing, implementing, testing, and debugging graphical user interfaces that respond to user events using Java. 5. Students will be able to learn java database programming.
MC9247 Network Programming Lab	<ol style="list-style-type: none"> 1. Use network programming concepts to develop and implement distributed applications. 2. Develop and implement next generation protocols required for emerging applications. 3. Model and evaluate performance of networking systems. 4. Hands on experience with Inter Process communication System Calls. 5. Hands on experience with TCP/UDP photocells.
MC9248 CASE TOOLS LAB	<ol style="list-style-type: none"> 1. Design and implement projects using OO concepts. 2. Use the UML analysis and design diagrams 3. Apply appropriate design patterns. 4. Create code from design 5. Compare and contrast various testing techniques
SEMESTER V	
MC9251 Middleware Technologies	<ol style="list-style-type: none"> 1. To study the set of services that a middleware system constitutes of. 2. To understand how middleware facilitates the development of distributed applications in heterogeneous environments. 3. To study how it helps to incorporate application portability, distributed application component interoperability and integration. 4. To learn the object oriented middleware basics through the example of the following CORBA objects.

	5. To understand the basics of Web services that is the most oft-used middleware technique
MC9252 Software Project Management	<ol style="list-style-type: none"> 1. Understand the activities during the project scheduling of any software application. 2. Learn the risk management activities and the resource allocation for the projects. 3. Can apply the software estimation and recent quality standards for evaluation of the software projects 4. Acquire knowledge and skills needed for the construction of highly reliable software project 5. Able to create reliable, replicable cost estimation that links to the requirements of project planning and managing
MC9254 Middleware Technology Lab	<ol style="list-style-type: none"> 1. Describe the benefits and architecture of Client Server Technology. 2. Understand the concepts of CORBA, RMI and .NetTechnologies. 3. Apply the components of C# .Net technology to given applications 4. Classify the architecture of CORBA and mapping the CORBA with existing Programming languages like Java. 5. Implement integration of component based architectures with Enterprise applications
MC9255 SOFTWARE DEVELOPMENT LAB	

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MA7151 Mathematical Foundations For Computer Applications	6. Acquire the basic knowledge of matrix, set theory, functions and relations concepts needed for designing and solving problems. 7. Able to design and solve Boolean functions for defined problems. 8. Acquire the knowledge of logical operations and predicate calculus needed for computing skill. 9. Apply the acquired knowledge of formal languages to the engineering areas like Compiler Design. 10. Apply the acquired knowledge of finite automata theory and design discrete problems to solve by computers.
MC7101 Computer Organization	6. Able to design digital circuits by simplifying the Boolean functions 7. Able to Understand the organization and working principle of computer hardware components 8. Able to understand mapping between virtual and physical memory. 9. Acquire knowledge about multiprocessor organization and parallel processing. 10. Able to trace the execution sequence of an instruction through the processor
MC7102 Problem Solving And Programming	6. Able to design a computational solution for a given problem. 7. Able to transform a problem solution into programs involving programming constructs 8. Able to break a problem into logical modules that can be solved (programmed). 9. To write programs using structures, strings, arrays, pointers and files for solving complex 10. Able to introduce modularity using functions and pointers which permit ad hoc run-time•computational problem. polymorphism
MC7103 DATABASE MANAGEMENT SYSTEMS	6. Understand the basic concepts of the database and data models. 7. design a database using ER diagrams and map ER into Relations and normalize the relations 8. Acquire the knowledge of query evaluation to monitor the performance of the DBMS. 9. Develop a simple database applications using normalization. 10. Acquire the knowledge about different special purpose databases and to critique how they differ from traditional database systems.
MC7104 DATA STRUCTURES AND	6. Able to write efficient algorithm for a given problem and able to analyze its time complexity.

ALGORITHMS	<ol style="list-style-type: none"> 7. Able to develop any new application with the help of data structures and algorithms. 8. Able to apply the algorithm design techniques to any of the real world problem. 9. Able to design their own data structure according to the application need. 10. Able to select and apply the data structure to suit any given problem.
I YEAR II SEM	
MC7201 OBJECT ORIENTED PROGRAMMING	<ol style="list-style-type: none"> 6. Able to understand and design the solution to a problem using object-oriented programming concepts 7. Able to demonstrate the use of virtual functions to implement polymorphism. 8. Able to use proper class protection mechanism to provide security. 9. Understand and implement the features of C++ including templates, exceptions and file handling for providing programmed solutions to complex problems 10. Able to reuse the code with extensible Class types, User-defined operators and function overloading
MC7202 WEB PROGRAMMING ESSENTIALS	<ol style="list-style-type: none"> 1. Acquire knowledge about functionalities of world wide web 2. Explore markup languages features and create interactive web pages using them 3. Learn and design Client side validation using scripting languages. 4. Acquire knowledge about Open source JavaScript libraries. 5. Able to design front end web page and connect to the back end databases.
MC7203 SYSTEM SOFTWARE	<ol style="list-style-type: none"> 1. Able to trace the path of a source code to object code and the to executable file 2. To design the front end of the compiler-scanner, parser 3. Understand and identify the relationship between system software architecture and machine. 4. Analyze the functions of assembler, compiler, linker, and loaders. 5. Know the design and implementation of loaders and linkers
MC7204 OPERATING SYSTEMS	<ol style="list-style-type: none"> 1. Able to understand the operating system components and its services 2. Implement the algorithms in process management and solving the issues of IPC. 3. Able to demonstrate the mapping between the physical memory and virtual memory 4. Able to understand file handling concepts in OS

		perspective. 5. Able to understand the operating system components and services with the recent OS
MC7205	COMPUTER GRAPHICS AND MULTIMEDIA	1. Gain proficiency in 3D computer graphics API programming. 2. Enhance the perspective of modern computer system with modeling, analysis and interpretation of 2D and 3D visual information. 3. Able to understand different realizations of multimedia tools. 4. Able to develop interactive animations using multimedia tools. 5. Gain the knowledge of different media streams in multimedia transmission.
II YEAR III SEM		
MC7301	COMPUTER NETWORKS	6. Able to trace the flow of information from one node to another node in the network. 7. Able to identify the components required to build different types of networks. 8. Able to understand the functionalities needed for data communication into layers. 9. Able to choose the required functionality at each layer for given application. 10. Able to understand the working principles of various application protocols 11. Acquire knowledge about security issues and services available
MC7302	EMBEDDED SYSTEMS	6. Able to design and control real time control systems. 7. Able to understand the functionality of 8085 microprocessor. 8. Able incorporate enhanced features in the embedded systems through software. 9. Able to rectify minor problems by troubleshooting 10. Acquire the knowledge of real time operating system and implement real time functions
MC7303	SOFTWARE ENGINEERING	1. Get an insight into the processes of software development 2. Able to understand the problem domain for developing SRS and various models of software engineering 3. Able to Model software projects into high level design using DFD,UML diagrams 4. Able to Measure the product and process performance using various metrics 5. Able to Evaluate the system with various testing techniques and strategies.
MC7304	PROFESSIONAL	1. Helps to examine situations and to internalize the need

ETHICS	<p>for applying ethical principles, values to tackle with various situations.</p> <ol style="list-style-type: none"> 2. Develop a responsible attitude towards the use of computer as well as the technology. 3. Able to envision the societal impact on the products/projects they develop in their career. 4. Understanding the code of ethics and standards of computer professionals. 5. Analyze the professional responsibility and empowering access to information in the work place.
MC 7305 INTERNET PROGRAMMING	<ol style="list-style-type: none"> 6. Able to understand the internet standards and recent web technologies like Conferencing, newsgroup etc. 7. Able to implement, compile, test and run Java program, 8. Able to make use of hierarchy of Java classes to provide a solution to a given set of requirements found in the Java API 9. Able to understand the components and patterns that constitute a suitable architecture for a web application using java servlets 10. Able to demonstrate systematic knowledge of backend and front end by developing an appropriate application.
II YEAR IV SEM	
MC7401 RESOURCE MANAGEMENT TECHNIQUES	<ol style="list-style-type: none"> 6. Understand and apply linear, integer programming to solve operational problem with constraints. 7. Apply transportation and assignment models to find optimal solution in warehousing and Travelling, 8. To prepare project scheduling using PERT and CPM 9. Identify and analyze appropriate queuing model to reduce the waiting time in queue. 10. Able to use optimization concepts in real world problems.
MC7402 OBJECT ORIENTED ANALYSIS AND DESIGN	<ol style="list-style-type: none"> 1. Understand the basic concepts to identify state & behavior of real world objects 2. Able to learn the various object oriented methodologies and choose the appropriate one for solving the problem with the help of various case studies 3. Understand the concept of analysis, design & testing to develop a document for the project. 4. Able to implement analysis, design & testing phases in developing a software project. 5. Able to understand the testing strategies and know about automated testing tools
MC7403 DATA WAREHOUSING AND DATA MINING	<p>Store voluminous data for online processing</p> <ol style="list-style-type: none"> 1. Preprocess the data for mining applications 2. Apply the association rules for mining the data 3. Design and deploy appropriate classification techniques

		<ol style="list-style-type: none"> 4. Cluster the high dimensional data for better organization of the data 5. Discover the knowledge imbibed in the high dimensional system 6. Evolve Multidimensional Intelligent model from typical system 7. Evaluate various mining techniques on complex data objects.
MC7404	NETWORK PROGRAMMING	<ol style="list-style-type: none"> 1. To write socket API based programs TOTAL: 45 PERIODS 2. To design and implement client-server applications using TCP and UDP sockets 3. To analyze network programs. 4. analyze the requirements of a networked programming environment and identify the issues to be solved; 5.
MC7005	SECURITY IN COMPUTING	<p>Apply cryptographic algorithms for encrypting and decryption for secure data transmission</p> <p>Understand the importance of Digital signature for secure e-documents exchange</p> <p>Understand the program threats and apply good programming practice</p> <p>Get the knowledge about the security services available for internet and web applications</p> <p>Understand data vulnerability and sql injection</p> <ol style="list-style-type: none"> 1. Gain the knowledge of security models and published standards
MC7411	SOFTWARE DEVELOPMENT-CASE TOOLS LABORATORY	<p>Design and implement projects using OO concepts.</p> <p>Use the UML analysis and design diagrams</p> <p>Apply appropriate design patterns.</p> <p>Create code from design</p> <ol style="list-style-type: none"> 5. Compare and contrast various testing techniques
MC7412	Network Programming Laboratory	<ol style="list-style-type: none"> 1. Use network programming concepts to develop and implement distributed applications. 2. Develop and implement next generation protocols required for emerging applications. 3. Model and evaluate performance of networking systems. 4. Hands on experience with Inter Process communication System Calls. 5. Hands on experience with TCP/UDP photocells.
MC7413		
III YEAR V SEM		
MC7501	WEB APPLICATION DEVELOPMENT	<ol style="list-style-type: none"> 1. Knows how to design and implement Internet systems for enhancing education and engineering design,

		<ol style="list-style-type: none"> 2. Able to understand functionality of Internet system 3. Able to design a system according to customer needs using the available Internet technologies. 4. Able to Design and develop interactive, client-side, server-side executable web applications. 5. Explore the features of various platforms and frameworks used in web applications development.
MC7502	SERVICE ORIENTED ARCHITECTURE	<ol style="list-style-type: none"> 1. Known about the basic principles of service oriented architecture , its components and techniques 2. Understand the architecture of web services 3. Able to design and develop web services using protocol 4. Understand technology underlying the service design 5. Acquire the fundamental knowledge of cloud computing.
MC7503	MOBILE COMPUTING	<ol style="list-style-type: none"> 1. Gain the knowledge about various types of Wireless data Networks and Wireless Voice Networks. 2. Understand the architectures, the challenges and the Solutions of Wireless Communication those are in use. 3. Realize the role of Wireless Protocols in shaping the future Internet. 4. Know about different types of Wireless Communication Networks and their functionalities. 5. Able to develop simple Mobile Application Using Android
MC7007	HEALTH CARE MANAGEMENT	<ol style="list-style-type: none"> 1. Develop an understanding of basic research skills applicable to the design, evaluation and implementation of appropriate Healthcare Information Systems (HIS) ; 2. Define and analyze the impact, strengths and weaknesses of various HIS in any healthcare settings 3. Write reports on the roles of HIS and their impact on facilitating superior healthcare delivery 4. Design a suitable HIS architecture 5. Use research methods and analysis together to plan the successful implementation of an appropriate HIS solution
MC7015	SOFTWARE PROJECT MANAGEMENT	<ol style="list-style-type: none"> 5. Understand the activities during the project scheduling of any software application. 6. Learn the risk management activities and the resource allocation for the projects. 7. Can apply the software estimation and recent quality standards for evaluation of the software projects 8. Acquire knowledge and skills needed for the construction of highly reliable software project 9. Able to create reliable, replicable cost estimation that links to the requirements of project planning and managing

MC7511 ADVANCED INTERENET PROGRAMMING LAB	<ol style="list-style-type: none"> 1. Apply object oriented programming, exception handling and multithreading concepts in problem solving. 2. Design and implement Applets, Parameterized Applets incorporating multithreading and event handling mechanisms. 3. Use swings aspects in graphical interactive application development and JDBC for database transactions, Handling HTTP requests and responses. 4. Develop applications using RMI and JSP 5. Apply object oriented programming, exception handling and multithreading concepts in problem solving.
MC7512 XML and Web Service Lab	<ol style="list-style-type: none"> 1. Create well-formed and valid XML documents 2. Create an XML schema using DTD and XSD 3. Given an DTD or XSD, create a valid XML document. 4. An ability to use current techniques, skills, and tools necessary for computing practice. 5. An ability to use and apply current technical concepts and practices in the core information technologies.
MC7513 Mini Project	<ul style="list-style-type: none"> • To understand the programming language concepts and basics of Software Development Life Cycle model for the implementation of the project. • To plan, analyze, design and implement a software project using SDLC model. • Learn to work as a team and to focus on getting a working project done within a stipulated period of time.