

Department of Computer Science and Engineering

Course Outcomes – ODD Semester 2020-2021

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| 1) | 3 | Theory | MA8351 - Discrete Mathematics |
| 2) | 3 | Theory | CS8351 - Digital Principles and System Design |
| 3) | 3 | Theory | CS8391 - Data Structures |
| 4) | 3 | Theory | CS8392 - Object Oriented Programming |
| 5) | 3 | Theory | EC 8395 - Communication Engineering |
| 6) | 3 | Practical | CS8381 - Data Structures Laboratory |
| 7) | 3 | Practical | CS8383 - Object Oriented Programming Laboratory |
| 8) | 3 | Practical | CS8382 - Digital Systems Laboratory |
| 9) | 3 | Practical | HS8381 - Interpersonal Skills/Listening &Speaking |
| 10) | 5 | Theory | MA8551 - Algebra and Number Theory |
| 11) | 5 | Theory | CS8591 - Computer Networks |
| 12) | 5 | Theory | EC8691 - Microprocessors and Microcontrollers |
| 13) | 5 | Theory | CS8501 - Theory of Computation |
| 14) | 5 | Theory | CS8592 - Object Oriented Analysis and Design |
| 15) | 5 | Theory | OAN551 – Sensors and Transducers |
| 16) | 5 | Practical | EC8681 - Microprocessors and Microcontrollers Laboratory |
| 17) | 5 | Practical | CS8582 - Object Oriented Analysis and Design Laboratory |
| 18) | 5 | Practical | CS8581 - Networks Laboratory |
| 19) | 7 | Theory | MG8591 - Principles of Management |
| 20) | 7 | Theory | CS8792 - Cryptography and Network Security |
| 21) | 7 | Theory | CS8791 - Cloud Computing |
| 22) | 7 | Theory | OCH752-Energy Technology |
| 23) | 7 | Theory | GE 8077 - Total Quality Management |
| 24) | 7 | Theory | CS8079 - Human Computer Interaction |
| 25) | 7 | Practical | CS8711 - Cloud Computing Laboratory |
| 26) | 7 | Practical | IT8761 - Security Laboratory |

ODD Semester 2019-2020

3rd Semester – B.E. CSE

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Find the pcnf & pdnf, rules of inference theory and proof methods. |
| CO2 | Understanding the mathematical Induction, pigeonhole principle, Permutations and combinations, Generating functions, Inclusion and exclusion principle and Applying its applications. |
| CO3 | Apply the concepts and techniques of Graphs and graph models |
| CO4 | Be exposed to concepts and properties of algebraic structures such as groups, rings and fields. |
| CO5 | Understanding lattices and Boolean algebra |
| CO6 | Develop knowledge in Logic, Graphs and algebraic system in engineering. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Simplify Boolean functions using KMap |
| CO2 | Design and Analyze Combinational Circuits. |
| CO3 | Design and Analyze Synchronous Sequential Circuits. |
| CO4 | Design and Analyze Asynchronous Sequential Circuits. |
| CO5 | Implement designs using Programmable Logic Devices. |
| CO6 | Write HDL code for combinational and Sequential Circuits. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Implement abstract data types using arrays and linked list. |
| CO2 | Apply the different linear data structures like stack and queue to various computing problems. |
| CO3 | Implement different types of trees and apply them to problem solutions. |
| CO4 | Discuss graph structure and understand various operations on graphs and their applicability. |
| CO5 | Analyze the various sorting and searching algorithms. |
| CO6 | Understand the hashing technique and hash functions. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Develop Java programs using OOP principles |
| CO2 | Develop Java programs using the concepts of inheritance and interfaces |
| CO3 | Build Java applications using exceptions and I/O streams |
| CO4 | Develop Java applications with threads and generics classes |
| CO5 | Develop interactive Java programs using swings |
| CO6 | Develop an application based upon the concepts of Java. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Describe the concepts of analog modulation systems |
| CO2 | Illustrate pulse communication techniques. |
| CO3 | Summarize the concepts of digital modulation systems |
| CO4 | Implement the source coding and Error control techniques. |
| CO5 | Explain the basic principles in the generation spread spectrum signals |
| CO6 | Explain the methods for multiple access in communication systems. |

Laboratory

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Write functions to implement linear and non-linear data structure operations |
| CO2 | Suggest appropriate linear / non-linear data structure operations for solving a given problem |
| CO3 | Appropriately use the linear / non-linear data structure operations for a given problem |
| CO4 | Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Develop and implement Java programs for simple applications that make use of classes |
| CO2 | Develop and implement Java programs with arraylist |
| CO3 | Develop and implement Java programs for simple applications that make use of classes |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Implement simplified combinational circuits using basic logic gates |
| CO2 | Implement combinational circuits using MSI devices |
| CO3 | Implement sequential circuits like registers and counters |
| CO4 | Simulate combinational and sequential circuits using HDL |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Listen and respond appropriately. |
| CO2 | Participate in group discussions |
| CO3 | Make effective presentations |
| CO4 | Participate confidently and appropriately in conversations both formal and informal |

5th Semester B.E. CSE

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Introduce the basic notions of groups which will be used to solve group theory related problems. |
| CO2 | Introduce the basic notions of rings, fields which will then be used to solve related problems. |
| CO3 | Introduce and apply the concepts of rings, finite fields and polynomials. |
| CO4 | Understand the basic concepts in number theory. |
| CO5 | Examine the key questions in the Theory of Numbers. |
| CO6 | Give an integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Understand the basic layers and its functions in computer networks |
| CO2 | Evaluate the performance of a network |
| CO3 | Understand the basics of how data flows from one node to another |
| CO4 | Analyze and design routing algorithm and protocols for various functions in the network |
| CO5 | Analyze functionalities and protocols at the Transport Layer |
| CO6 | Understand the working of various application layer protocols |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Describe the architecture of 8086, addressing modes and machine language instruction formats. |
| CO2 | Differentiate minimum and maximum modes of 8086 and concepts of I/O Programming |
| CO3 | Describe 8255 modes of operation, interfacing A to D, D to A converters |
| CO4 | Apply the programming techniques in designing simple assembly language programs for solving simple problems by using instruction sets of microcontroller |
| CO5 | Describe the architecture of 8051 microcontroller and its addressing modes |
| CO6 | Design a microcontroller based system |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Students should be able to design an automata for any given pattern |
| CO2 | Students should be able to specify regular expression for any string pattern |
| CO3 | Students should be able to write context free grammar for any language |
| CO4 | Students should be able to apply turing machine to propose computation solution |
| CO5 | Students should be able to interpret whether a problem is decidable or not |
| CO6 | Students should be able to interpret NP class problems |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Explain OOAD concepts and various UML diagrams. |
| CO2 | Illustrate about domain models and conceptual classes |
| CO3 | Explain Dynamic and implementation UML diagram. |
| CO4 | Select an appropriate design pattern |
| CO5 | Develop Code from Design, Compare and contrast various testing techniques |
| CO6 | Demonstrate various designing Techniques |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Write ALP Programmes for fixed and Floating Point and Arithmetic operations. |
| CO2 | Interface different I/Os with processor. |
| CO3 | Generate waveforms using Microprocessors. |
| CO4 | Execute Programs in 8051. |
| CO5 | Explain the difference between simulator and Emulator. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Outline the basic idea about fundamentals of GIS. |
| CO2 | Understand the types of spatial data models. |
| CO3 | Discuss about the data input and topology. |
| CO4 | Understand the data management functions and data output. |
| CO6 | Outline the application of GIS. |
| CO6 | Apply the GIS tools to develop real time applications. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Perform OO analysis and design for a given problem specification. |
| CO2 | Identify and map basic software requirements in UML mapping. |
| CO3 | Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns. |
| CO4 | Test the compliance of the software with the SRS. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Implement various protocols using TCP and UDP. |
| CO2 | Compare the performance of different transport layer protocols. |
| CO3 | Use simulation tools to analyze the performance of various network protocols. |
| CO4 | Analyze various routing algorithms. |
| CO5 | Implement error correction codes. |

7th Semester B.E. CSE

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Describe the historical evolution of management theories for business organizations |
| CO2 | Demonstrate the use of planning tools for strategic management. |
| CO3 | Identify the most appropriate organizational structure. |
| CO4 | Discuss HR strategies for planning, recruiting and training employees. |
| CO5 | Explain the theories of motivation and leadership to manage a group. |
| CO6 | Summarize the controlling methods and tools to increase productivity of the Organization. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Understand the fundamentals of networks security, security architecture, threats and vulnerabilities |
| CO2 | Apply the different cryptographic operations of symmetric cryptographic algorithms |
| CO3 | Apply the different cryptographic operations of public key cryptography |
| CO4 | Apply the various Authentication schemes to simulate different applications. |
| CO5 | Understand various Security practices |
| CO6 | Understand System security standards |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Describe the principles of Parallel and Distributed Computing and evolution of cloud computing from existing technologies |
| CO2 | Implement different types of Virtualization technologies and Service Oriented Architecture systems |
| CO3 | Elucidate the concepts of NIST Cloud Computing architecture and its design challenges |
| CO4 | Analyse the issues in Resource provisioning and Security governance in clouds |
| CO5 | Choose among various cloud technologies for implementing applications |
| CO6 | Install and use current cloud technologies |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Understand fundamental supply chain management concepts. |
| CO2 | Understand the design factors and various design options of distribution networks in industries |
| CO3 | Understand the framework of supply chain networks and functions |
| CO4 | Understand the foundational role of logistics as it relates to transportation and warehousing. |
| CO5 | Understand the various sourcing decisions in supply chain |
| CO6 | Understand the supply chain management in IT industries |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Understand the quality philosophies and customer focused managerial system |
| CO2 | Summarize the quality management principles |
| CO3 | Apply six sigma concept in manufacturing and service sector |
| CO4 | Determine the tools and techniques for quality improvement. |
| CO5 | Analyze standards and auditing system on implementation of TQM. |
| CO6 | Analyze standards for the operation of EMS. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Examine the effective dialog for HCI |
| CO2 | Inspect interactive design process in human computer interaction |
| CO3 | Apply six sigma concept in manufacturing and service sector |
| CO4 | Determine the tools and techniques for quality improvement. |
| CO5 | Analyze standards and auditing system on implementation of TQM. |
| CO6 | Analyze standards for the operation of EMS. |

Laboratory

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Configure various virtualization tools such as Virtual Box, VMware workstation |
| CO2 | Design and deploy a web application in a PaaS environment |
| CO3 | Learn how to simulate a cloud environment to implement new schedulers |
| CO4 | Install and use a generic cloud environment that can be used as a private cloud. |
| CO5 | Manipulate large data sets in a parallel environment |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Develop code for classical Encryption Techniques to solve the problems |
| CO2 | Build cryptosystems by applying symmetric and public key encryption algorithms |
| CO3 | Construct code for authentication algorithms |
| CO4 | Develop a signature scheme using Digital signature standard |
| CO5 | Demonstrate the network security system using open source tools |

Course Outcomes – EVEN Semester 2020-2021

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| 1) | 4 | Theory | MA8402 - Probability and Queueing Theory |
| 2) | 4 | Theory | CS8491 - Computer Architecture |
| 3) | 4 | Theory | CS8492 - Database Management Systems |
| 4) | 4 | Theory | CS8451 - Design and Analysis of Algorithms |
| 5) | 4 | Theory | CS8493 - Operating Systems |
| 6) | 4 | Theory | CS8494 - Software Engineering |
| 7) | 4 | Practical | CS8481 - Database Management Systems Laboratory |
| 8) | 4 | Practical | CS8461 - Operating Systems Laboratory |
| 9) | 4 | Practical | HS8461 - Advanced Reading and Writing |
| 10) | 6 | Theory | CS8651 - Internet Programming |
| 11) | 6 | Theory | CS8691 - Artificial Intelligence |
| 12) | 6 | Theory | CS8601 - Mobile Computing |
| 13) | 6 | Theory | CS8602 - Compiler Design |
| 14) | 6 | Theory | CS8603 - Distributed Systems |
| 15) | 6 | Theory | IT8076 - Software Testing |
| 16) | 6 | Practical | CS8661 - Internet Programming Laboratory |
| 17) | 6 | Practical | CS8662 - Mobile Application Development Laboratory |
| 18) | 6 | Practical | CS8611 - Mini Project |
| 19) | 6 | Practical | HS8581 Professional Communication |

EVEN Semester 2020-2021

4th Semester – B.E. CSE

| COs | Course Outcome : The students, after the completion of the course, are expected to |
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| CO1 | Find the distribution and measures of Discrete and continuous random variables |
| CO2 | Evaluating the measures of two dimensional Discrete and continuous random variables |
| CO3 | Apply the concept of random processes to characterize a random signal. |
| CO4 | Examine Queueing Models and find the characteristics of Queueing system |
| CO5 | Analyzing series Queues and Queueing networks |
| CO6 | Understanding Correlation and Linear regression of two dimensional Discrete and continuous random variables |

| COs | Course Outcome : The students, after the completion of the course, are expected to |
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| CO1 | Identify the basic organization of computer system and performance of a computer system. |
| CO2 | Utilize the basic instruction set, operations and addressing modes of MIPS architecture. |
| CO3 | Examine the procedure involved in designing ALU |
| CO4 | Compare and Contrast the non-pipelined and pipelined data path implementation of MIPS |
| CO5 | Inspect Parallel Processing challenges, Hardware Multithreading and Multicore architectures |
| CO6 | Examine the performance of Memory and I/O systems. |

| COs | Course Outcome : The students, after the completion of the course, are expected to |
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| CO1 | Discuss the fundamental concepts of relational database and SQL |
| CO2 | Use ER model for Relational model mapping to perform database design effectively |
| CO3 | Summarize the properties of transactions and concurrency control mechanisms |
| CO4 | Outline the various storage and optimization techniques |
| CO5 | Compare and contrast various indexing strategies in different database systems |
| CO6 | Explain the different advanced databases |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Explain the Analysis of Algorithm Efficiency and Compare the Mathematical analysis for Recursive and Non-recursive algorithms. |
| CO2 | Identify the efficiency of Brute Force And Divide-And-Conquer technique algorithms. |
| CO3 | Identify the efficiency of Dynamic Programming And Greedy Technique algorithms. |
| CO4 | Solve the problems using Iterative Improvement technique. |
| CO5 | Solve the problems using Backtracking and Branch and Bound Technique. |
| CO6 | Outline the limitations of Algorithm power. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Explain the overall view of the computer system and operating system. |
| CO2 | Apply various CPU scheduling algorithms, synchronization primitives and deadlock handling methods |
| CO3 | Compare and contrast various memory management schemes and file system functionalities |
| CO4 | Analyze the performance of the various page replacement algorithms and interpret the file system implementation, sharing and protection mechanisms. |
| CO5 | Analyze the performance of the various disk scheduling algorithms |
| CO6 | Demonstrate administrative tasks on Linux servers and to be familiar with the basics of Mobile OS like iOS and Android |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Identify the key activities in managing a software project and recognize different process model |
| CO2 | Explain the concepts of Requirements Engineering and Analysis Modeling. |
| CO3 | Outline the systematic procedures for software design and deployment. |
| CO4 | Compare various testing and maintenance methods |
| CO5 | Interpret the project schedule, estimate project cost and effort required. |
| CO6 | Outline various risk management activities and identifying risks through RMMM Plan. |

Laboratory

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Use typical data definitions and manipulation commands. |
| CO2 | Design applications to test Nested and Join Queries. |
| CO3 | Implement simple applications that use Views. |
| CO4 | Implement applications that require a Front-end Tool. |
| CO5 | Critically analyze the use of Tables, Views, Functions and Procedures. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Compare the performance of various CPU Scheduling Algorithms. |
| CO2 | Implement Deadlock avoidance and Detection Algorithms. |
| CO3 | Implement Semaphores. |
| CO4 | Create processes and implement IPC. |
| CO5 | Analyze the performance of the various Page Replacement Algorithms. |
| CO6 | Implement File Organization and File Allocation Strategies. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Write different types of essays. |
| CO2 | Write winning job applications. |
| CO3 | Read and evaluate texts critically. |
| CO4 | Display critical thinking in various professional contexts |

6th Semester – B.E. CSE

| COs | Course Outcome : The students, after the completion of the course, are expected to |
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| CO1 | Create a basic website using HTML and Cascading Style Sheets |
| CO2 | Design and implement dynamic web page with validation using JavaScript objects and by applying different event handling mechanisms |
| CO3 | Access JSON data files and use the content within JavaScript |
| CO4 | Design and implement server side programs using Servlets, JDBC and JSP |
| CO5 | Design and implement simple web page in PHP, and to present data in XML format |
| CO6 | Design a simple web page using AJAX |

| COs | Course Outcome : The students, after the completion of the course, are expected to |
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| CO1 | Use appropriate search algorithms for any AI problem. |
| CO2 | Represent a problem using first order and predicate logic. |
| CO3 | Provide the apt agent strategy to solve a given problem. |
| CO4 | Design software agents to solve a problem. |
| CO5 | Design applications for NLP that use Artificial Intelligence. |

| COs | Course Outcome : The students, after the completion of the course, are expected to |
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| CO1 | Understand the basic concepts of mobile computing |
| CO2 | Explain the basics of mobile telecommunication systems |
| CO3 | Illustrate the generations of telecommunication systems in wireless networks |
| CO4 | Demonstrate the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network |
| CO5 | Explain the functionality of Transport and Application layers |
| CO6 | Develop a mobile application using android/blackberry/ios/Windows SDK |

| COs | Course Outcome : The students, after the completion of the course, are expected to |
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| CO1 | Design various phases of compiler, a lexical analyzer and use LEX tool. |
| CO2 | Design a syntax analyzer and use YACC tool. |
| CO3 | Discuss intermediate code generation. |
| CO4 | Discuss the various storage allocation strategies and implement a code generator. |
| CO5 | Apply the various optimization techniques. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Elucidate the foundations and issues of distributed systems. |
| CO2 | Understand the various synchronization issues and global state for distributed systems. |
| CO3 | Comprehend the Mutual Exclusion and Deadlock detection algorithms in distributed systems. |
| CO4 | Show the use of agreement protocols and fault tolerance mechanisms in distributed systems |
| CO5 | Relate the features of peer-to-peer and distributed shared memory systems |
| CO6 | Interpret the real-time distributed system applications |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Design test cases suitable for a software development for different domains |
| CO2 | Identify suitable tests to be carried out |
| CO3 | Prepare test planning based on the document |
| CO4 | Document test plans and test cases designed |
| CO5 | Use automatic testing tools |
| CO6 | Develop and validate a test plan |

Laboratory

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Construct Web pages using HTML/XML and style sheets. |
| CO2 | Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms. |
| CO3 | Develop dynamic web pages using server side scripting. |
| CO4 | Use PHP programming to develop web applications. |
| CO5 | Construct web applications using AJAX and web services |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Develop mobile applications using GUI and Layouts. |
| CO2 | Develop mobile applications using Event Listener. |
| CO3 | Develop mobile applications using Databases. |
| CO4 | Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multithreading and GPS. |
| CO5 | Analyze and discover own mobile app for simple needs. |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | On Completion of the mini project students will be in a position to take up challenging real world problems and find solution using appropriate methodology |

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| COs | Course Outcome : The students, after the completion of the course, are expected to |
| CO1 | Make effective presentations |
| CO2 | Participate confidently in Group Discussions. |
| CO3 | Attend job interviews and be successful in them |
| CO4 | Develop adequate Soft Skills required for the workplace |