**M.TECH Computer Science and Engineering-Regular**

**Batch (2022)**

**M.Tech First Semester**

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| **Program Name:** M.Tech (2Year) | **Program Code**:**CSEM2PUP** |
| **Program Specific Outcomes:**   * To apply knowledge of recent computing technologies, skills and current tools of computer science and engineering. * To design and conduct experiments as well as to analyse and interpret data. * To explore research gaps, analyse and carry out research in specialized emerging areas. * To design software systems, components or process to meet identified needs within economic, environmental and social constraints. * To recognize the need to engage in lifelong learning through continuing education and research. * To work in multidisciplinary and multicultural environment and have social and ethical responsibilities. | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name:** RESEARCH METHODOLOGY | **Course Code**: CSEM1101T |
| **Course Outcomes:**   * To understand the basic Concepts of Research and its methodologies. * Ability to find the research Problem, its design together with data collection and analysis. * To organize and conduct research in appropriate manner using appropriate statistical techniques. * Ability to write research Reports and Thesis. | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name:** DESIGN PRINCIPLES OF OPERATING SYSTEM | **Course Code**: CSEM1102T |
| **Course Outcomes:**   * To understand the concept of a process, operations on processes, process states, concurrent processes, process control block, process context. * To learn about Interprocess Communication (IPC), Message Passing, Direct and Indirect. * To understand Functions of File and Directory structures, blocks and fragments, directory tree, inodes, file descriptors, UNIX file structure. * To Implement Protection and Security, access rights, access matrix. | |

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| **Program Name:** M.Tech (2Year) | **Program Code: CSEM2PUP** |
| **Course Name:**DIGITAL IMAGE PROCESSING | **Course Code**: CSEM1103T |
| **Course Outcomes:**   * To perform the basic image processing operations, * To Implement the image enhancement, edge detection and noise analysis, image compression, morphology and segmentation techniques * To represent images efficiently * To apply these concepts in different digital image processing applications like medical diagnosis, object detection and recognition etc. in different fields | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name:** INTERNET OF THINGS | **Course Code**: CSEM1104T |
| **Course Outcomes:**   * To understand the basic concepts, fundamentals, architecture of IOT * To understand the application areas of IOT.to understand the application areas of IOT * To realize the revolution of Internet in Mobile Devices, Cloud & Sensor Network * To understand building blocks of Internet of Things and characteristics | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name:** Ethical hacking | **Course Code** CSEM1105T |
| **Course Outcomes:**   * To introduce hacking, types and importance of ethical hacking. * To determinevulnerabilities issues and their resolution mechanisms. * Learn recent trends in hacking and core concepts of ethicalhacking paradigm. * Understand and applyingtools in scanning attacks. * Illustrate the fundamental concepts of testing and demonstrate the use of penetration test. * Understand various security issues in the Ethical hacking. | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name:** ADVANCED DATA STRUCTURE AND APPLICATIONS | **Course Code**: CSEM1106T |
| **Course Outcomes:**   * To design, analyze, and implement the basic data structures for different kinds of problems. * To analyze the asymptotic performance of algorithms. * To understand the complexity analysis of fundamental algorithms. * Choose appropriate data structures and algorithms for a specific problem. * Employ Graphs to model engineering problems | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name:** ADVANCED ARTIFICIAL INTELLIGENCE | **Course Code**:CSEM1107T |
| **Course Outcomes:**   * To have a thorough understanding of achievements of artificial intelligence and the theory underlying those achievements. * To assess the applicability, strengths, and weaknesses of the basic as well as advanced knowledge representation techniques. * To have an understanding of various types of problem solving methods of artificial intelligence. * Illustrate the importance of probability in knowledge representation for reasoning under uncertainty * Discuss the architecture for expert system and intelligent agent and implement an intelligent agent/expert system | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name:** RESEARCH METHODOLOGY LAB | **Course Code**:CSEM1150P |
| **Course Outcomes:**   * To understand the basic Concepts of Research and its methodologies. * Ability to find the research Problem, its design together with data collection and analysis. * To organize and conduct research in appropriate manner using appropriate statistical techniques.   Ability to write research Reports and Thesis. | |

**M.Tech Second Semester**

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| **Program Name:** M.Tech (2Year) | **Program Code**:**CSEM2PUP** |
| **Program Specific Outcomes:**   * To apply knowledge of recent computing technologies, skills and current tools of computer science and engineering. * To design and conduct experiments as well as to analyse and interpret data. * To explore research gaps, analyse and carry out research in specialized emerging areas. * To design software systems, components or process to meet identified needs within economic, environmental and social constraints. * To recognize the need to engage in lifelong learning through continuing education and research. * To work in multidisciplinary and multicultural environment and have social and ethical responsibilities. | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name:** SOFTWARE ENGINEERING CONCEPTS AND METHODOLOGIES | **Course Code** CSEM1202T |
| **Course Outcomes:**   * Knowledge of basic SW engineering methods and practices, and their appropriate application. * Understanding of software requirements and the SRS documents. * Understanding of implementation issues such as modularity and coding standards. * Understanding of software testing approaches such as unit testing and integration testing. * To produce efficient, reliable, robust and cost-effective software solutions. * Ability to work as an effective member or leader of software engineering teams. | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name:** CLOUD INFRASTRUCTURE AND SERVICES | **Course Code**: CSEM1203T |
| **Course Outcomes:**   * To introduce cloud computing, types of cloud services and enabling technologies. * To make them understand the role and usage of virtualization technologies. * To introduce cloud security issues and their resolution mechanisms. * To make them understand the features and usage of cloud platform * Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS. * Understand various security issues in the cloud. | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name**: **MINOR PROJECT** | **Course Code**:CSEM1250P |
| **Course Outcomes:**   * To apply theoretical computer science and engineering concepts to real world problems. * To identify the area for research work. * To perform literature survey in the research area and identify research gaps. * To develop research paper and reportwriting skills. | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name:** MACHINE LEARNING | **Course Code** CSEM1201T |
| **Course Outcomes:**   * To understand the basic theory underlying machine learning. * To be able to formulate machine learning problems corresponding to different applications. * To be able to apply machine learning algorithms to solve problems of moderate complexity. * Learn algorithmic topics of machine learning and mathematically deep enough to introduce the required theory. * Develop an appreciation for what is involved in learning from data | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name:** Multimedia Systems | **Course Code**:CSEM1206T |
| **Course Outcomes:**   * To introduce the fundamental principles and basic elements of multimedia system to students. This course will provide an understanding of the current technologies of multimedia systems and issues in effectively representing, processing, and retrieving multimedia contents such as texts, sound and music, graphics, images, videos and animations. * The emphasis will be on learning the representations, perceptions and applications of multimedia. Software skills and hands on work on digital media will also be emphasized. * On completion of the subject, the students will understand the technologies behind multimedia applications and master the skills for developing multimedia projects * Summarize the key concepts in current multimedia technology and usage in different real-life areas. * Create quality multimedia software titles, applications, animation films selecting any area of real-life applications. | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name:** ADVANCED DATABASE SYSTEMS | **Course Code**: CSEM1204T |
| **Course Outcomes:**   * To provide a strong foundation in advanced database concepts. * To covers advanced data modeling concepts like OOD Modeling and ORD Modeling. * To learn query processing and transaction management concepts for object-relational database and distributed database. * Produce data modeling and database development process for object –oriented DBMS. * Examine the issues related to multimedia and mobile database performance | |

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| **Program Name:** M.Tech (2Year) | **Program Code: CSEM2PUP** |
| **Course Name:** BIG DATA ANALYTICS | **Course Code** CSEM1207T |
| **Course Outcomes:**   * UnderstandtheBigDataPlatform ApacheHadoop anditsUsecases * UnderstandMapReduceJobs andInterfacingwithHDFS * ApplyanalyticsonStructured,UnstructuredData.ExposuretoDataAnalyticswithR. * DevelopBigDataSolutionsusingHadoopEcoSystem * ApplyMachineLearningTechniquesusingR | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name**: SOFT COMPUTING | **Course Code** CSEM1205T |
| **Course Outcomes:**   * Introduce students to fuzzy theory from an engineering perspective. * To introduce soft computing concepts and techniques. * To foster their abilities in designing appropriate technique for a given scenario. * To implement soft computing based solutions for real-world problems. * To give students knowledge of non-traditional technologies and fundamentals of fuzzy sets, fuzzy logic, genetic algorithms | |

**M.Tech 2nd year**

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Program Specific Outcomes:**   * To apply knowledge of recent computing technologies, skills and current tools of computer science and engineering. * To design and conduct experiments as well as to analyse and interpret data. * To explore research gaps, analyse and carry out research in specialized emerging areas. * To design software systems, components or process to meet identified needs within economic, environmental and social constraints. * To recognize the need to engage in lifelong learning through continuing education and research. * To work in multidisciplinary and multicultural environment and have social and ethical responsibilities. | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **CourseName:ADVANCED NATURAL LANGUAGE PROCESSING** | **CourseCode**: CSEM2301T |
| **Course Outcomes:**   * Understand approaches to syntax and semantics in NLP. * Understand approaches to discourse, generation, dialogue and summarization * within NLP. * Understand machine learning Techniques used in NLP. | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name: ADVANCED DATA MININGAND ANALYSIS** | **Course Code** CSEM2302T |
| **Course Outcomes:**   * Perform the pre-processing of data and apply mining techniques. * Classify the association rules, classification, and clusters in large data sets. * Solve real world problems in business using data mining. * Use data analysis tools for business and scientific applications. * Can access the data from different files like Excel, Word, SQL, PDF etc. * Describe complex data types with respect to spatial and web mining. | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name: ADVANCED COMPUTER CRIME INVESTIGATIONS AND FORENSICS** | **Course Code**: CSEM2303T |
| **Course Outcomes:**   * Understanding and investigation about the basics of cybercrime, its types and impact on society in sociological and criminological perspectives. * Investigation of various sources of cybercrimes, its reasons and IT act related to cyber crimes * Understanding of digital forensic, various forms of digital forensic and its investigating process * Understanding of different types of image forensic tools and techniques. | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name: PARALLEL AND DISTRIBUTED COMPUTING** | **Course Code** CSEM2304T |
| **Course Outcomes:**   * Design and implement distributed computing systems and distributed algorithms. * Hands-on experiment with mechanisms such as client-server and P2P algorithms, remote procedure calls, and consistency. * Analyze the requirements for programming parallel systems. * Differentiate between the major classes of parallel processing systems. * Analyze the efficiency of a parallel processing system and evaluate the types of application forwhich parallel programming is used | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name: E-COMMERCE** | **Course Code:** CSEM2305T |
| **Course Outcomes:**   * Analyze the impact of E-commerce on business models and strategy. * Describe the major types of E-commerce. * Explain the process that should be followed in building an E-commerce presence. * Identify the key security threats in the E-commerce environment. * Describe the E-cycle of Internet marketing. | |
| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name: Software Project Management** | **Course Code:** CSEM2306T |
| **Course Outcomes:**   * CO1 To Understand the Software Projects, their requirements, management and Control. * CO2 To develop understanding of Process models, metrics and cost analysis. * CO3 To develop ability for the Software Project Planning and resource management. * Co4 To manage Resources and the project as a Whole | |
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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name: COMPILERDESIGN** | **Course Code:** CSEM2307T |
| **Course Outcomes:**   * Able to convert any instruction of a program to convert from source language to target language and should be recognize what happens at each and every phase of a compiler. * Able to understand the different types of parsingtechniques and should be in a position to solve the problem * Able to analyze the program and minimize the code by using optimizing techniques which helps in reducing the number of instructions in a program and also utilization of registers in an effective way | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name**: **MAJOR PROJECT** | **Course Code**:CSEM2350P |
| **Course Outcomes:**   * To formulate a research problem from the research gaps discovered in Minor Project. * To design and develop a domain specific project as a solution to the formulated research problem. * To application of state-of-art techniques and draw comparisons. * To develop research paper and report writing skills.   . | |

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| **Program Name:** M.Tech (2Year) | **Program Code**: **CSEM2PUP** |
| **Course Name**: **DISSERTATION** | **Course Code**:CSEM2401 P |
| **Course Outcomes:**   * + To perform a thorough survey of a particular domain.   + To find a research problem and present a methodology to resolve the problem.   + To obtain adequate experimental results to strengthen the contribution to research.   + To learn about communicating the impact of their research work by different tools   + which includes video, poster and presentation in conferences/journals   . | |