| M.Tech I YEAR —I Sem | | | | | | | | |
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| **Code** | **Course** | **Course Outcomes** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
| GR18D5001 | Mathematical Foundation For Computer Science Applications | 1. Demonstrate the basic notions of distribution functions, discrete and continuous probability. | M | | M | H | H | M |
| | | 2. Formulate the methods of statistical inference and the role that sampling distributions play in those methods. | H | H | | H | H | H |
| | | 3. Perform correct and meaningful statistical analysis of simple to moderate complexity. | M | H | | H | M | |
| | | 4. Solve mathematical as well as graphical problems in systematic and logical manner and also familiarity in calculating number of possible outcomes of elementary combinatorial processes such as permutations and combinations. | H | H | H | H | H | H |
| | | 5. Apply discrete structures in computer science for various engineering applications. | M | H | H | H | | H |
| GR18D5002 | 1.Advanced Data Structures | 1.Demonstrate the implementation of the symbol table using hashing techniques. | H | | H | | H | H |
| | | 2. Develop and analyze algorithms for red-black trees, B-trees and Splay trees. | | H | | H | M | |
| | | 3. Develop algorithms for text processing applications. | M | H | | H | M | H |

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| | | 4. Identify suitable data structures and develop algorithms for computational geometry problems. | M | H | M | H | H | M |
| | | 5.Compare and contrast various computational geometry methods for efficiently solving new evolving problems. | | H | H | | H | H |
| GR18D5003 | Advanced Data Mining | 1. Summarize the basic data mining tasks and various types of pattern mining. | M | | H | | H | H |
| | | 2. Apply classification techniques for data mining. | | H | | H | M | |
| | | 3.Evaluate the performance of different advanced clusteringalgorithms. | M | M | | M | | M |
| | | 4. Analyse recent trends in data mining such as web mining, text mining andspatial mining. | H | H | M | H | H | M |
| | | 5. Construct temporal association rules and sequence mining algorithms | H | H | H | | H | H |
| GR18D5004 | Information Security | 1.Analyze information security governance, and related issues. | H | M | H | | H | H |
| | | 2.Illustrate various cryptography algorithms. | M | | H | | H | M |
| | | 3.Apply authentication mechanisms and Hash functions to provide secure data exchange. | M | | H | M | H | M |
| | | 4.Access networksecurity design using available secure solutions (such as PGP,S/MIME andIPSec). | M | M | M | M | H | M |

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| | | 5.Infer advanced security issues and technologies | H | H | M | M | H | H |
| GR18D5005 | Advanced Python Programming | 1. Demonstrate understanding of modern version controltools. | M | M | | | M | M |
| | | 2. Demonstrate understanding of the role of testing in scientific computing, andwriteunittestsin Python. | M | M | H | M | H | H |
| | | 3. Use command linetools to write and edit code. | M | | | | | M |
| | | 4. Implement publication-ready graphics from a dataset. | H | H | | M | H | H |
| | | 5. Summarize sorting techniques | M | M | | | | |
| GR18D5006 | Computer System Design | 1. Demonstrate IA-32 Pentium processor architecture and Computer I/O operations | H | | M | M | H | M |
| | | 2. Compare hardwired control and micro programmed control in the processingunit. | H | H | | | H | H |
| | | 3. Illustrate the management of different type of memories in the computersystem | | | | | M | |
| GR18D5007 | Object Oriented Modelling | 1. Able to know the fundamental principles of OO programming and key principles in OO analysis, design, and development. | M | M | | M | M | H |
| | | 2. Able to Design Behavioral and ArchiterutalModeling | | | | M | | |

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| | | UML Diagrams for Real time Applications. | | | | | | |
| | | 3. Demonstrate the Unified Process Phases and uses of the Use cases in architecture | M | | | | M | H |
| | | 4. Understand the iterative and incremental and generic iteration work flows in unified process. | M | M | | M | M | H |
| | | 5. Develop software applications using inception,elaboration, constructionand transition phases | H | H | H | M | M | H |
| GR18D5008 | Distributed Computing | 1.Compare and differentiate between different forms of computing techniques and computing paradigms. | M | H | M | | M | H |
| | | 2.Demonstrate the remote method invocation and its comparison with CORBA | M | M | | M | M | M |
| | | 3.Define and study the Distributed Document Based systems and distributed multimedia systems. | M | M | | | | M |
| | | 4.Interpret the characteristics of distributed multimedia systems. | M | M | | | M | M |
| | | 5.Express the outline of Grid computing concept and cluster computing concept | M | M | M | M | H | M |
| GR18D5012 | Research Methodology | 1. Understand research problem formulation. | H | | M | M | M | H |

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| | And IPR | 2. Analyze research related information and follow research ethics | M | H | | M | H | |
| | | 3. Understand that today's world is controlled by Computer, Information Technology, but tomorrow's world will be ruled by ideas, concepts, and creativity. | | | M | | M | |
| | | 4. Understand that when IPR would take such an important place in the growth of individuals &nations, it is needless to emphasize the need for information about Intellectual Property Rights to be promoted among students in general&engineering. | H | M | H | M | H | M |
| | | 5. Understand the nature of Intellectual Property and IPR in International scenarios. | M | H | H | H | | M |
| GR18D5013 | Advanced Data Structures Lab | 1. Choose appropriate data structure asapplied to specified problem definition. | H | M | H | | M | H |
| | | 2. Handle operations like searching, insertion, deletion, traversing mechanism etc. on various datastructures. | H | H | | | M | |
| | | 3. Use linear and non-linear data structures like stacks, queues, linkedlists etc. | H | | H | M | H | H |

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| | | 4. Implement various searching and sorting algorithms | H | M | | M | | M |
| | | 5. Apply the various data structures in real time applications | H | M | H | | M | |
| GR18D5009 | Advanced Data Mining Lab | 1. Adapt to new data mining tools. | M | H | M | H | | |
| | | 2. Explore recent trends in data mining such as web mining, spatial-temporalmining | M | M | H | M | M | M |
| | | 3. To understand the basic principles, concepts and applications of data warehouse and data mining. | H | H | M | H | | |
| | | 4. Ability to create training data set using data mining tools. | M | H | M | M | H | H |
| | | 5. Explores knowledge on Clustering and Classificationanalysis. | H | | M | | H | H |
| GR18D5010 | Information Security Lab | 1. Use the concepts of different ciphers for encryption and decryption. | H | M | M | | H | H |
| | | 2. Implement symmetric encryption algorithms. | M | | | | H | M |
| | | 3. Examineasymmetric encryption algorithms. | M | | | | H | M |
| | | 4. Interpret hash algorithms and their functionalities. | M | | | | H | M |
| | | 5. Solve the problems on digital signatures and digital certificates. | H | M | M | | H | H |
| GR18D5011 | Advanced Python Programming Lab | 1. Take a huge step towards OOP, Object Orientated Programming | H | | M | | M | H |
| | | 2. Learn many advanced Python methods and variables | H | | M | | | M |

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| | | 3. Adequately use Python programming in functions,modules | H | | M | | M | M |
| | | 4. Ability to summarize searching and sorting techniques | | | | | | M |
| | | 5.Learn matrix arithmetic and ability to design graphics for video games | M | | M | | M | M |

| **M.Tech I YEAR —II Sem** | | | | | | | | |
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| **Code** | **Course** | **Course Outcomes** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
| GR18D5014 | Machine Learning And Applications | 1. Compare Supervised and Unsupervised Learning methods. | H | M | H | H | M | H |
| | | 2. Demonstrate various Ensemble methods and apply Statistical LearningTheory to real world problems. | H | H | H | H | M | H |
| | | 3. Analyze Deep Learning and Feature Representation techniques. | H | H | H | H | M | H |
| | | 4. Categorize the Scalable Machine Learning techniques. | H | H | H | H | H | H |
| | | 5. Summarize the recent trends in various machine learning methods for IOT applications. | H | M | H | H | M | H |

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| GR18D5015 | Advanced Algorithms | 1.Analyze performance of different algorithms. | H | M | M | M | H | H |
| | | 2. Determine the appropriate data structure for solving a particular set of problems | | M | M | M | | H |
| | | 3. Apply algorithmic paradigms for advanced algorithmic problems. | | M | M | M | M | H |
| | | 4. Apply various mathematical techniques for solving the problems. | H | M | | M | M | H |
| | | 5. Categorize the different problems in various classes according to their complexity. | H | M | M | M | M | H |
| GR18D5016 | Image Processing | 1. Analyze general terminology of digital image processing and image transforms. | H | M | M | | H | H |
| | | 2. Examine various types of images, Filtering techniques. | H | M | M | | H | H |
| | | 3. Examine Image Restoration models. | H | M | M | | M | H |
| | | 4. Evaluate the methodologies for image segmentation. | H | M | | | M | H |
| | | 5.Demonstrate image | H | M | M | | M | H |

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| | | compression techniques. | | | | | | |
| GR18D5017 | Advanced Data Science | 1. Examine Data Science process and use its toolkit for a problem. | H | M | M | | H | H |
| | | 2. Interpret how data is collected, stored and managedfrom multiplesources. | H | M | M | M | H | H |
| | | 3. Differentiate various Machine Learning algorithms used for dataanalysis. | H | M | M | | M | H |
| | | 4. Practice different data visualization techniques. | H | M | | M | M | H |
| | | 5. Categorize the applications of Data Science and summarize the recent trends for application development using data science. | H | M | M | | M | H |
| GR18D5018 | Data Analytics | 1. Illustrate R programming for dataanalytics. | H | M | H | M | M | H |
| | | 2.Explain connecting of R to NoSQL databases and interpret Summary Statistics | H | M | H | M | M | H |
| | | 3. Demonstrate Regression analysis and correlation. | H | M | H | | M | H |
| | | 4. Compare various Verticals - Engineering, | H | M | H | | H | H |

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| | | Financial and others. | | | | | | |
| | | 5. Apply how to manage our work to meet requirements and choose to work effectively with Colleagues. | H | M | H | M | M | H |
| GR18D5019 | High Performance Computing | 1. Understand the key dimensions, advantages and challenges of Cloud computing. | H | M | M | M | M | H |
| | | 2. Explain and characterize different typesof clouds. | H | M | | | H | H |
| | | 3. Examine the different services offered by cloud and exploring the state of art of major cloud players. | H | M | | | H | H |
| | | 4. Providecloud computing solutions for individual users as well as enterprises. | M | M | M | | H | H |
| | | 5. Present the assessment of the economics, financial, and technological implications for selecting cloud computing foran organization | M | M | M | M | M | H |
| GR18D5021 | Advanced Computer Networks | 1. Find the difference, advantages, disadvantages between Wired | M | | M | | M | H |

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| | | and Wireless Networking Technologies and different transmission technologies | | | | | | |
| | | 2. Set-up IP addresses in different systems and practically realize the pathof routing. | M | M | M | M | M | M |
| | | 3. Differentiate between Uni-casting, Broadcasting and Multicasting and develop the routing protocols. | M | M | M | | M | M |
| | | 4. Implement virtual Cellular communication and Ad hoc communication and measure the performance of the network using Network Simulators. | M | M | M | | M | H |
| | | 5. Demonstrate the Optical Network and Wireless Sensor Network. | M | M | M | M | H | M |
| GR18D5025 | Machine Learning And Applications Lab | 1. Illustrate various basic features of python or R-Tool. | H | M | H | M | M | |
| | | 2. Implement Python script for simple problems and apply pandas for creation of databases. | H | M | H | M | M | H |

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| | | 3. Design various supervised learning mechanisms. | H | M | H | M | M | |
| | | 4. Analyze various unsupervised learning algorithms. | H | H | H | H | H | |
| | | 5. Illustrate Random Forest Ensemble method. | H | M | H | M | M | |
| GR18D5022 | IMAGE PROCESSING LAB | 1. Implement Denoise of images, Linear filtering of images | M | | | M | M | H |
| | | 2. Apply the principles of segmentation, grouping and modeling in image processing and computervision. | M | | | M | M | H |
| | | 3. Evaluate the methodologies for image segmentation, restorationetc. | M | M | | M | M | H |
| | | 4. Implement image process with morphological operations. | M | | | M | M | H |
| | | 5. Implement image processing compression. | M | M | | M | M | H |
| GR18D5023 | Advanced Data Science Lab | 1. Examine the process for importing and exporting the data. | M | | M | | M | H |
| | | 2. Interpret how data iscollected, | M | M | M | M | M | H |

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| | | stored and managed from multiple sources. | | | | | | |
| | | 3.Practice different data analysis anddata visualization techniques | M | M | M | | M | H |
| | | 4. Differentiate various Statistical and Machine Learning algorithms | M | M | M | | M | H |
| | | 5. Apply the Data Science techniques to real world problems. | M | M | M | M | H | H |
| GR18D5024 | Data Analytics Lab | 1. Demonstrate proficiency with statistical analysis of data. | H | M | M | M | M | H |
| | | 2. Construct and assess data-based models. | H | M | | | H | H |
| | | 3. Apply data modelling techniques to large datasets. | H | M | | | H | H |
| | | 4.Design applications for data analytics using R programming. | M | M | M | | H | H |
| | | 5. Identify tools for data analytic solution. | M | M | M | M | M | H |
| GR18D5190 | Mini Project | 1. Choose the problem domain in the specialized area under computer science andengineering. | H | M | H | H | M | H |

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| | | 2. Acquire and categorize the solution paradigms with help of case studies | H | M | H | H | M | H |
| | | 3. Design and code using selected hardware, software and tools. | H | M | H | M | M | H |
| | | 4.Execute, Implement and demonstrate the problem statement by using the selected hardware, software and tools. | H | H | H | H | H | H |
| | | 5. Document the thesis and publish the final work in a peer reviewedjournal. | H | M | H | H | M | H |

| **M.Tech II YEAR — I Sem** | | | | | | | | |
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| **Code** | **Course** | **Course Outcomes** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
| GR18D5026 | Mobile Applications And Services | 1. To identify the mobile application environment and to recite about developing mobile applications usingandroid. | H | M | M | | H | H |

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| | | 2. To design and implement the user interface, data storing and retrieval in mobile environment. | H | M | M | | H | H |
| | | 3. To implement an application using mobile Memory management, networking, clock and notification. | H | M | M | | M | H |
| | | 4. To comprehend about IOT in mobile communications and its applications. | H | M | | | M | H |
| | | 5. To identify the mobile application environment and to recite about developing mobile applications using android. | H | M | M | | M | H |
| GR18D5027 | Information Storage And Retrieval | 1. Use IRS capabilities and information visualization technologies. | H | M | M | | H | H |
| | | 2. Demonstrate the use of Cataloging and Indexing. | M | | M | | H | M |
| | | 3. Differentiate software text search algorithms and hardware text searchsystems. | M | | M | | H | M |

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| | | 4. Analyze the accuracy for various clustering algorithms. | M | | M | | H | M |
| | | 5. Construct multimedia retrieval systems. | H | M | M | | H | H |
| GR18D5201 | BUSINESS ANALYTICS | 1. Demonstrate business analytics process and use statistical tools for implementation of business process. | H | M | M | M | M | H |
| | | 2.Design relationships and trends to explore and visualize the data. | H | M | | | H | H |
| | | 3. Examine the organization structures of business analytics and Categorize types of analytics. | H | M | | | H | H |
| | | 4. Apply Forecasting Techniques, Monte Carlo Simulation and RiskAnalysis. | M | M | M | | H | H |
| | | 5. Formulate decision analysis and summarize recent trends in business intelligence. | M | M | M | M | M | H |

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| GR18D5040 | Distributed Databases | 1. Demonstrate a view of the Distributed Database environment | M | | M | | M | H |
| | | 2. Applicability to solve the fragment queries | M | M | M | M | M | H |
| | | 3. Capable of understanding the architecture of the distributed database environment. | M | M | M | | M | H |
| | | 4. Define of the Transaction and the Concurrency issues | M | M | M | | M | H |
| | | 5. Understand the outline of the object databases | M | M | M | M | H | H |

| **M.Tech II YEAR — II Sem** | | | | | | | | |
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| **Code** | **Course** | **Course Outcomes** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
| GR15D5177 | **Project Work and Dissertation** | 1. Choose a specialized are in the field of computer science and engineering. | H | | H | | | M |
| | | 2. Choose the problem domain in the specialized area under computer science and engineering. | H | | H | | M | M |

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| | | 3. Discover the appropriate requirement, hardware, software and tools for the identified problem domain. | H | H | | | | |
| | | 4. Acquire and categorize the solution paradigms with help of case studies | H | | H | H | H | |
| | | 5. Design and code using selected hardware, software and tools. | H | | H | M | H | |
| | | 6. Execute, Implement and demonstrate the problem statement by using the selected hardware, software and tools. | | H | | H | | |
| | | 7. Document the thesis and publish the final work in a peer reviewed journal. | | H | | | H | H |