| Year | Course Name | Course Outcome No. | Course Outcome |
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| | | | ME (SEM - I) |
| ME | Probability and Statistics | CO1 | CO1: Apply matrices, Vectors for solving Linear systems |
| | | CO2 | CO2: Analyze Eigenvalues and Eigenvectors problems |
| | | CO3 | CO3. Solve examples using Inner product and dot product |
| | | CO4 | CO4: Demonstrate various PDFs with a suitable example |
| | | CO5 | CO5: Create Contingency Tables using Statistics |
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| ME | Advanced Algorithms | CO1 | CO1.Evaluate and contrast the efficiency of polynomial time algorithms by examiningtheir per formance across the worst, best, and average case scenarios. |
| | | CO2 | CO2.Utilize appropriate algorithmic techniques to address problems involving binomial coeffi cients, chain matrix multiplication, and longest common subsequence. |
| | | CO3 | CO3. Develop and apply problem-solving skills to address real-world business challenges and decision-making scenarios. |
| | | CO4 | CO4.Evaluate the effectiveness and accuracy of randomized algorithms, considering both their efficiency and correctness. |
| | | CO5 | CO5.Apply problem-solving techniques tailored for multi-core, distributed, or concurrent envi ronments to effectively address complex computational challenges. |
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| ME | Machine Learning | CO1 | CO1: Apply different feature extraction, classification, regression, algorithms and modeling. |
| | | CO2 | CO2: Evaluate the performance of an algorithm and comparison of different learning tech niques. |
| | | CO3 | CO3: Understand unsupervised methods and their applications |
| | | CO4 | CO4: Optimize the algorithms effectively |
| | | CO5 | CO5: Apply techniques using different case studies |
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| ME | Distributed Computing | CO1 | CO1- Understand the design principles in distributed systems and the architectures for dis tributed systems. |
| | | CO2 | CO2- Apply various distributed algorithms related to clock synchronization, concurrency con trol, deadlock detection, load balancing, voting etc. |
| | | CO3 | CO3-Analyse fault tolerance and recovery in distributed systems and algorithms for the same. |
| | | CO4 | CO4-Analyse the design and functioning of existing distributed systems and file systems. |
| | | CO5 | CO5-Implement different distributed algorithms over current distributed platforms. |
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| ME | Computational Laboratory-I | CO1 | CO1: Apply matrices, Vectors for solving Linear systems |
| | | CO2 | CO2: Analyze Eigenvalues and Eigenvectors problems |
| | | CO3 | CO3. Solve examples using Inner product and dot product |
| | | CO4 | CO4: Demonstrate various PDFs with a suitable example |
| | | CO5 | CO5: Create Contingency Tables using Statistics |
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| ME | Data Engineering | CO1 | CO1: Explain the core concepts, lifecycle, and goals of data engineering. |
| | | CO2 | CO2: Design data pipelines for data ingestion, storage, and processing |
| | | CO3 | CO3: Apply data transformation and ETL principles using conceptual tools |
| | | CO4 | CO4: Evaluate batch vs stream processing architectures and their use cases. |
| | | CO5 | CO5: Analyze challenges of scalability, security, quality, and ethics in data workflows. |
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| ME | Deep Learning | CO1 | CO1: Fundamentals: Demonstrate mastery of fundamental deep learning concepts. |
| | | CO2 | CO2: Application: Apply deep learning algorithms to solve practical engineering problems. |
| | | CO3 | CO3: Model Development: Design, implement, and evaluate deep learning models. |
| | | CO4 | CO4: Critical Analysis: Critically evaluate deep learning methodologies and their limitations. |
| | | CO5 | CO5: Problem Solving: Develop and implement solutions using deep learning techniques ap propriate to given contexts. |
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| ME | Business Intelligence | CO1 | CO1: Critically appraise current theory and practice in Big Data Analytics, Decision Support Systems and Business Intelligence |
| | | CO2 | CO2: Appraise the role of BI strategy in driving companies' insight. |
| | | CO3 | CO3: Apply data analysis and visualization on a sample dataset, appropriate to the level of study, and to provide recommendations on the driven insights to specialist and non-specialist audiences. |
| | | CO4 | CO4: Identify and appraise emerging trends within the field and evaluate the social and ethical aspects |
| | | CO5 | CO5: Communicate complex topics and concepts effectively using different communication means such as report writing, use of ICT and/or presentation to specialist and non-specialist audience. |
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| ME | Internet of Things | CO1 | CO1: Summarize the concepts of network connected embedded devices. |
| | | CO2 | CO2: Design suitable network architecture and use appropriate protocols for a given IOT appli cation. |
| | | CO3 | CO3: Identify and summarize different components required for IOT applications. |
| | | CO4 | CO4: Analyse the system through Data Analytics tools. |
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| ME (SEM - II) | | | |
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| ME | Quantum Computing | CO1 | CO1: Explainhowthephysicsofquantumcomputation is different from classical computational models. |
| | | CO2 | CO2: Describe the theoretical performance improvements that quantum algorithms offer com pared to classical algorithms. |
| | | CO3 | CO3: Analyze the life cycle of hybrid applications and decompose their execution on a hybrid quantum-classical computational continuum. |
| | | CO4 | CO4: Develop their own (hybrid) quantum algorithms and implement them using (real or simulated) quantum computers using quantum toolkits such as Qiskit. |
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| ME | Cyber Security | CO1 | CO1. Analyze cyber-attacks to protect them for the entire Internet community. |
| | | CO2 | CO2. Interpret and forensically investigate security incidents |
| | | CO3 | CO3. Apply policies and procedures to manage Privacy issues |
| | | CO4 | CO4. Design and develop secure software modules |
| | | CO5 | CO5. Apply data protection techniques to solve the privacy issues. |
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| ME | Natural Language Processing | CO1 | CO1: Familiarize with the fundamentals of natural language processing. |
| | | CO2 | CO2: Perform text preprocessing for natural language processing. |
| | | CO3 | CO3: Apply backpropagation algorithm of artificial neural network. |
| | | CO4 | CO4: Distinguish the parts of transformer. |
| | | CO5 | CO5: Choose and propose an appropriate model in real life problem. |
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| ME | Computational Laboratory-II | CO1 | CO1. Analyze quantum algorithms considering 1-qubit / 2-qubit gate operators and ability to design quantum circuits. |
| | | CO2 | CO2. Demonstrate various types of cyber-attacks and cyber-crimes, threats and risks within the context of application. |
| | | CO3 | CO3. Use of Tokenization, Part-of-Speech Tagging, Bag of Words (BOW), N-Grams Models in NLP |
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| ME | Cloud and Edge Technology | CO1 | CO1: Approach designing of parallel computation based better. |
| | | CO2 | CO2: Implement the solutions for various applications |
| | | CO3 | CO3: Learn and use Open Source and Commercial Clouds |
| | | CO4 | CO4: Design and implement distributed applications using cloud and edge platforms |
| | | CO5 | CO5: Apply security, privacy, and compliance mechanisms for cloud and edge computing sce narios. |
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| ME | Generative Artificial Intelligence | CO1 | CO1: Explain the evolution, types, and ethical considerations of Generative AI models. |
| | | CO2 | CO2: Analyse the architecture and working principles of Transformers, Large Language Models (LLMs), and multimodal generative models. |
| | | CO3 | CO3: Implement AI-based text, image, and audio generation techniques using state-of-the-art models. |
| | | CO4 | CO4: Utilize industry-standard frameworks (Hugging Face, OpenAI APIs, TensorFlow/Keras) to build and fine-tune generative AI models. |
| | | CO5 | CO5: Evaluate real-world applications, challenges, and emerging trends in Generative AI across different domains. |
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| ME | Game Theory and Applications | CO1 | O1. Understand game logic and visualization |
| | | CO2 | CO2. Understand user interface and various elements of game |
| | | CO3 | CO3. Understand the game design process and decision making |
| | | CO4 | CO4. Students will be able to design various face 2D and 3D game characters. |
| | | CO5 | CO5. Apply the principles of AI to problem solving, knowledge representation, learning. |
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| ME | Bio-Inspired Computing | CO1 | CO1. Describe the natural phenomena that motivate the algorithm |
| | | CO2 | CO2. Apply nature-inspired algorithms to optimization |
| | | CO3 | CO3. Select the appropriate strategy or optimal solution based on bio-inspired algorithms. |
| | | CO4 | CO4: Formulate real-life projects using algorithms studied |
| | | CO5 | CO5: Analyze the strengths and limitations of various bio-inspired algorithms for solving opti mization and search problems |
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| ME | Federated Learning | CO1 | CO1: Describe the fundamentals, types, and advantages of federated learning. |
| | | CO2 | CO2: Analyze and compare federated learning architectures and optimization algorithms. |
| | | CO3 | CO3: Identify privacy, security, and communication challenges in federated learning. |
| | | CO4 | CO4: Apply federated learning concepts to real-world use cases and frameworks. |
| | | CO5 | CO5: Evaluate federated learning performance under non- independent identically distributed |
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| ME | Real-Time Operating Systems | CO1 | CO1: Create, test and debug on RTOS environment |
| | | CO2 | CO2: Implement Inter task communication mechanism. |
| | | CO3 | CO3: Compare general purpose OS with RTOS |
| | | CO4 | CO4: Demonstrate methods in storing, retrieving data in RTOS |
| | | CO5 | CO5: Analyze performance of task during multitasking. |
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| ME | Social Media Analytics | CO1 | CO1: Explain social media ecosystems and the characteristics of social data. |
| | | CO2 | CO2:Describe data collection mechanisms and preprocessing techniques. |
| | | CO3 | CO3: Apply theoretical models for sentiment analysis, topic modeling, and opinion mining. |
| | | CO4 | CO4: Analyze social networks and user behaviors using graph-based metrics. |
| | | CO5 | CO5: Evaluate the impact of social media analytics in various domains with ethical awarene |
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| ME | Next Generation Networks | CO1 | CO1: Describe the basic characteristics, structure and operation of wired and wireless networks. |
| | | CO2 | CO2. Identify appropriate architectural models, systems strategies and use cases for a range of modern network concepts. |
| | | CO3 | CO3. Implement solutions to key challenges in modern network architecture, e.g., scalability |
| | | CO4 | CO4. Evaluate the performance of queues and develop network traffic models. |
| | | CO5 | CO5.Assess the operation of medium access protocols in contemporary wireless standards for local and wide area networks, and Internet of Things, and discuss co-existence between different types of systems. |
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| ME | Technical Seminar -I | CO1 | CO1 : Formulate the goals and objectives of scientific research; |
| | | CO2 | CO2 : Search, evaluate and analyze information about the achievements of science and technology in the target area and beyond; |
| | | CO3 | CO3 : Interpret data from different fields of science and technology; |
| | | CO4 | CO4 : Build the logic of reasoning and statements; |
| | | CO5 | CO5 : Create, design and edit text documents in accordance with the requirements of the |
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| ME (SEM - III) | | | |
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| ME | Research Methodology | CO1 | CO1 : Define research and explain its essential characteristics with examples from engineering and science fields. |
| | | CO2 | CO2 : Identify and apply different types of research (basic, applied, qualitative, quantitative, exploratory, descriptive, etc.) to specific problems. |
| | | CO3 | CO3 : Analyze the outcomes of research such as publications, patents, and technological contributions, and understand their societal and industrial impacts. |
| | | CO4 | CO4 : Apply ANOVA and ANCOVA techniques for effective experimental data analysis andinterpretation of results. |
| | | CO5 | CO5 : Understand and apply the basics of Intellectual Property Rights (IPR) to safeguard innovative research and prevent unethical practices. |
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| ME | Internship/On Job Training (IN/OJT | CO1 | CO1 - Gain practical experience within industry in which the internship is done. |
| | | CO2 | CO2 - Acquire knowledge of the industry in which the internship is done. |
| | | CO3 | CO3 - Apply knowledge and skills learned to classroom work. |
| | | CO4 | CO4 - Develop and refine oral and written communication skills. |
| | | CO5 | CO5 - Acquire the knowledge of administration, marketing, finance and economics. |
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| ME | Technical Seminar - II | CO1 | CO1 - Gain fundamental concepts and categories in the field of scientific research- ways of organizing and planning research |
| | | CO2 | CO2 - Advanced information technologies allowing us to acquire new knowledge in various fields |
| | | CO3 | CO3 - Learn features of the technical and scientific style of writing texts |
| | | CO4 | CO4 - Evaluation criteria and methods of handling incomplete data |
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| ME | Research Project Stage - I | CO1 | CO 1 : Demonstrate how to search the existing literature to gather information about a specificproblem or domain. |
| | | CO2 | CO 2 : Identify the state-of-the-art technologies and research in the chosen domain, and highlight open problems that are relevant to societal or industrial needs. |
| | | CO3 | CO 3 : Evaluate various solution techniques to determine the most feasible solution within given constraints for the chosen dissertation problem |
| | | CO4 | CO 4 : Apply software engineering principles related to requirements gathering and design toproduce relevant documentation. |
| | | CO5 | CO 5 : Write a dissertation report that details the research problem, objectives, literature review,and solution architecture. |
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| ME(Semester IV) | | | |
| ME | Technical Seminar - III | CO1 | CO1 : Formulate the goals and objectives of scientific research; |
| | | CO2 | CO2 : Search, evaluate and analyze information about the achievements of science and technology in the target area and beyond; |
| | | CO3 | CO3 : Interpret data from different fields of science and technology; |
| | | CO4 | CO4 : Build the logic of reasoning and statements; |
| | | CO5 | CO5 : Create, design and edit text documents in accordance with the requirements of theorganization or publisher; |
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| ME | Research Project Stage-I | CO1 | CO1 : Undertake independent research that makes an original contribution to knowledge,or produces a novel synthesis of existing materials relevant to significant conversations in the discipline |
| | | CO2 | CO2 : Plan their project in advance, using a proposal to describe their undertaking, describehow it will be managed, and reflect upon its value |
| | | CO3 | CO3 : Relate their original research to existing literature on the subject and relate their workto general themes in their relevant scholarly literature |
| | | CO4 | CO4 : Assemble their rationale, methods, findings, and analysis into a substantial piece of writing that presents a clear thesis and a cohesive evidence-based argument or analysis |
| | | CO5 | CO5 : Reflect on the strengths and weaknesses of their research and methodology, understanding how they might improve their efforts in future work |
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