Department of CSE - AIML

Course Outcomes

4MATH1011: ENGINEERING MATHEMATICS –I

CO1: Apply the knowledge of calculus to analyse and approximate the functions. L3
CO2: Calculate rates of change of multivariate functions. L3
CO3: Solve multiple integrals for computing area and volume. L3
CO4: Make use of Gradient, divergence and curl for solving Engineering problems. L3
CO5: Use the concept vector integration to solve the flow problems. L3

4PHYS1011: ENGINEERING PHYSICS

CO1: Plot the I-V characteristics of photo-diode, LED and solar cells. L3
CO2: Make use of Lasers and Optical fibres for different industrial applications. L3
CO3: Explain the use of Magnetic and Superconducting materials for different engineering applications. L4
CO4: Analyse the applications of quantum mechanics in technology. L4
CO5: Infer the results obtained in different experiments L3

4ENEE1011: ELEMENTS OF ELECTRICAL ENGINEERING

CO1: Analyze electrical circuits by relevant Laws in DC circuits. L4
CO2: Demonstrate the single phase and three-phase power generation by using the phasor diagrams. L3
CO3: Illustrate the construction and operation of DC machines and understand the concept of electrical wiring, protecting devices and earthing. L3
CO4: Explain the construction and operation of AC machines L2

4CSGC1011: ELEMENTS OF COMPUTER ENGINEERING

CO1: Demonstrate functioning of different sub-systems, OS and different types of OS. L3
CO2: Use different types of data structures, operations and algorithms. L3
CO3: Describe the fundamental elements of relational database management systems. L2
CO4: Comprehend the layered protocol model & Classification of networks. L3
CO5: Demonstrate need for Linux OS and Linux commands. L3

4ENME1011: COMPUTER AIDED ENGINEERING DRAWING

CO1: Illustrate competence in basics of orthographic projections of points, lines, planes and solids in three different views. L3
CO2: Apply the concepts of orthographic projections for simple objects. L3
CO3: Develop surfaces of solids of simple objects. L3

4MATH1021: ENGINEERING MATHEMATICS II

CO1: Solve first order linear ordinary differential equations. L3
CO2: Solve higher order differential equations arising through physical processes. L3

CO3: Construct a variety of partial differential equations and solve them. L4
CO4: Use periodic signals to represent periodic functions in the form of Fourier series. L3
CO5: Make use of matrix theory for solving system of linear equations L3

4CHEM1012: ENGINEERING CHEMISTRY

CO1: Explain the construction and working of Energy storage devices. L2
CO2: Explain corrosion of metals, factors and prevention techniques. L2
CO3: Explain the importance of the modern emerging field of nanotechnology. L2
CO4: Use instruments which give quick and accurate results for material analysis. L3
CO5: Carry out different types of titrations for estimation of concentration of an analyte. L3

4ENCE1011: ELEMENTS OF ELECTRONICS ENGINEERING

CO1: Describe semiconductor devices and its applications L2
CO2: Analyze the various circuits of BJT L4
CO3: Employ op-amp in various circuits L3
CO4: Analyze digital circuits L4
CO5: Appreciate the importance of transducers and communication systems L5

4ENME1022: ELEMENTS OF MECHANICAL ENGINEERING AND WORKSHOP

CO1: Recognize the impact of energy sources on the environment and sustainability. L2
CO2: Explain the working principles of water, vapour and gas-powered Systems. L2
CO3: Discuss the working principles of refrigeration systems and IC engines. L2
CO4:Compute various performance parameters of IC engines. L3
CO5: Demonstrate soldering, brazing and welding of sheet metal & welded joints. L2

4ENCV1011: ELEMENTS OF CIVIL ENGINEERING

CO1: Explain the basics of Civil Engineering and related fields. L2
CO2: Develop working models with the laws of mechanics. L3
CO3: Analyze equilibrium of coplanar, concurrent and non-concurrent forces. L4
CO4: Determine centroid and moment of inertia of simple geometric figures. L3
CO5: Apply D'Alembert's principle in any specific application. L3

4CSPL1011: PROBLEM SOLVING USING PYTHON

CO1: Understand the basis of algorithm problem solving L2
CO2: Read/Write simple simple python programs L3
CO3: Develop python programs with conditionals and loops. L3
CO4: Use python functions and python data structures L3
CO5: Read and write data from/to files in python programs L3

4MATH2131: ENGINEERING MATHEMATICS-III

CO1: Explain the propositional, predicate logic and truth table by evaluating correctness of argument.-L2
CO2: Discus the type of relationship and apply the knowledge using the Hasse diagram .-L2
CO3: Demonstrate the knowledge of combinatorics by solving relevant problems.-L2

CO4: Apply binomial, Poisson, normal and exponential probability distributions to solve engineering problems -L3
CO5: Construct elementary regression models by the method of least squares -L3

4CSPL1111: PROBLEM SOLVING AND PROGRAMMING USING C

CO1: Explain the basic computer concepts and programming principles of C language L2
CO2: Develop C programs to solve simple mathematical, engineering problems using conditionals and looping constructs L4
CO3: Develop C programs to demonstrate the applications of arrays in C L3
CO4: Execute programs to demonstrate the basic concepts of Strings and Pointers L3
CO5: Develop C programs to demonstrate the applications of functions in C L4

4CSPL1022 DATA STRUCTURES

CO1: Choose appropriate data structure as applied to specified problem Definition L2
CO2: Handle operations like searching, insertion, deletion, traversing mechanism etc,on various data structures L3
CO3: Apply concepts learned in various domains like DBMS, compiler etc L3
CO4: Use linear and non-linear data structures like stacks, queues, linked list. L3
CO5: write the programs using data structures in any programming language L4

4AIML1011: INTRODUCTION TO ARTIFICIAL INTELLIGENCE

CO1 Elucidate the basic concepts of Artificial Intelligence L2
CO2 Analyse Artificial Intelligence techniques, such as search algorithms, for problem solving L4
CO3 Apply techniques of Knowledge Representation and Planning L3
CO4 Apply knowledge of reasoning in the presence of incomplete or uncertain information L3
CO5 Explain different forms of Learning L2

4CSPL2011: WEB DEVELOPMENT USING PYTHON AND DJANGO

CO1: Create database using SQLite L6
CO2: Create web client programs using Python L6
CO3: Create web server programs using python L6
CO4: Create website using Django framework L6
CO5: Create to-do application using Django and React JS L6

4MATH2021-ENGINEERING MATHEMATICS-IV

CO1 Explain the concept of testing of hypothesis for small and large samples -L2
CO2 Apply the knowledge and skills of numerical methods to solve algebraic and transcendental equations-L3
CO3 Apply the simplex algorithm to solve a linear programming problem -L3
CO4: Solve linear recurrence relations by recognizing homogeneity, linearity and constant coefficients. L3
CO5: Explain the basic concepts of graph theory. L2

4CSPL3011: PYTHON FOR DATA SCIENCE

CO1: Analyse data science applications L4

CO2: Apply data collection and wrangling techniques L3
CO3: Analyse how to manipulate the uncharted datasets using NumPy L4
CO4: Analyse how to manipulate the uncharted datasets using Pandas L4
CO5: Apply visualization techniques L4

4CSGC2021: DATABASE MANAGEMENT SYSTEMS

CO1:Differentiate database systems from file system by understanding the features of database system and design a ER model for a database system L4
CO2: Develop solutions to a broad range of query and data update problems using relational algebra and SQL. L3
CO3: Apply the normalization theory in relational databases for removing anomalies. L3
CO4: Compare database storage and access techniques for file organization, indexing methods. L2
CO5: Analyse the basic issues of transaction processing and concurrency control. L2

4AIML2021: Pattern Recognition

CO1: Explain the concept and use of Probability theory & statistics in pattern recognition - L3
CO2: Estimate and evaluate probability distributions in pattern recognition - L5
CO3:Analyse and evaluate the data description and estimation techniques - L5
CO4: Analyse the use of Linear Models for Regression in Pattern Recognition - L4
CO5: Build and evaluate basic tree models along with its applications in pattern recognition - L5

4AIML2031: Operating Systems for AI

CO1:Students will be able to explain the key principles and functions of operating systems, including process management, memory management, and file systems L1
CO2: Students will demonstrate the ability to apply various scheduling algorithms and evaluate their performance characteristics through simulations and experiments. L2
CO3: Students will develop skills in using operating system tools and commands to monitor and manage system resources effectively. L3
CO4: Students will design and implement simple operating system components, such as process schedulers or memory allocators, to solve practical problems. L3
CO5: Students will analyze case studies and research papers on advanced operating system topics, critically evaluate their implications, and propose solutions to complex engineering problems. L4

4CSDS2051-Big Data Analytics (P)

CO1: Understand the fundamental concepts of big data analytics and its significance in various industries.
CO2: Analyze large volumes of structured and unstructured data using Appropriate tools and techniques.
CO3: Design and implement scalable data processing pipelines for big data analytics applications
CO4: Evaluate and apply advanced machine learning algorithms to extract insights and patterns from big data.
CO5: Develop practical skills in handling real-world big data challenges and deploying analytical solutions

4CSPL3021 - ADVANCED PYTHON FOR AI

CO1 Gain proficiency in advanced Python programming techniques required for artificial intelligence (AI) development L2.

CO2 Understand and implement data structures and algorithms efficiently in Python for AI applications. L3
CO3 Apply object-oriented programming (OOP) principles effectively to design and develop complex AI systems. L2
CO4 Utilize Python libraries and frameworks such as NumPy, Pandas, and TensorFlow for AI tasks. L3
CO5 Demonstrate the ability to solve real-world AI problems using Python programming language. L2

4CSGC3081: DATA MINING

CO1: Explain the concepts of data mining and its issues L4
CO2: Analyze and apply association rule mining techniques L3
CO3: Analyze various classification algorithms L3
CO4: Elaborate the clustering algorithms L2
CO5: Illustrate the trends and applications L2

4CSPL3031: R Language

CO1: Understand the Installation steps and fundamental functions of R language L2
CO2: Apply the Conditional constructs and data management in data processing L2
CO3: Use the data management concepts in the programming L3
CO4: Understand the Data Frames and its use in data processing L1
CO5: Apply the data visualization tools to plot the data in different formats L3

4CSGC3041: Cryptography

CO1: Explain the different concepts of cryptography - L2
CO2: Describe the principles of symmetric and asymmetric cryptography – L2
CO3: To apply the asymmetric key encipherment techniques - L3
CO4: To apply the concepts of hashing algorithms - L3
CO5: Understanding the real life examples of Cryptography L2

4CSGC3051: Software Security

CO1: Understand the basics of secure programming - L2
CO2: Understand the most frequent programming errors leading to software vulnerabilities – L2
CO3: Identify and analyze security problems in software – L2
CO4: To fix software flaws and bugs in various software – L3
CO5: Understanding to prevent the cybercrime – L2

4CSPL3071: Network Programming in UNIX & C

CO1: Identify interfaces and frameworks applications.
CO2: Solve the socket functions for data communication.
CO3: Design TCP echo client server program.
CO4: Develop UDP Client Server programs using socket functions.
CO5: Analyze the difference between broadcast and multicast programs.

4AIML2061: Software Engineering for AI

CO1: Understand the principles of software engineering as they apply to artificial intelligenc development. – L2

CO2: Gain proficiency in designing, implementing, and testing AI systems following software engineering best practices. – L3
CO3: Analyze and select appropriate software architectures and design patterns for AI applications - L4
CO4: Apply agile and iterative development methodologies to manage AI projects effectively. – L3
CO5: Demonstrate the ability to integrate soft computing techniques such as fuzzy logic, genetic algorithms, and ontologies into AI software systems. – L4

4AIML2071 - Computer Vision

CO1: Understand the fundamental principles and techniques of computer vision. L1
CO2: Analyze and implement image processing algorithms for tasks such as filtering, edge detection, and image enhancement. L2
CO3: Design and develop computer vision systems for object detection, recognition, and tracking L3
CO4:. Evaluate and apply deep learning approaches to solve complex computer vision problems. L3
CO5: Demonstrate proficiency in applying computer vision techniques to real-world applications across - L4

4AIML2081: Recommender System

CO1: Understand the principles and algorithms used in recommender systems. L1
CO2: Gain proficiency in implementing and evaluating different types of recommendation algorithms. L2
CO3: Learn to develop collaborative filtering, content-based filtering, and hybrid recommender systems L3
CO4: Explore advanced topics in recommender systems such as context-aware recommendation and deep learning-based approaches. L3
CO5: Apply recommender system techniques to real-world datasets and evaluate their performance. L4

4AIML2091 - Natural language Processing

CO1: Understand the fundamental concepts and techniques of natural language processing (NLP). L1
CO2: Analyze and apply various methods for text preprocessing, tokenization, and feature extraction. L2
CO3: Design and develop NLP models for tasks such as text classification, named entity recognition, and sentiment analysis L3
CO4: Explore advanced topics in NLP such as deep learning for sequence modeling and language generation L3
CO5: Apply NLP techniques to solve real-world problems across domains such as information retrieval, sentiment analysis, and machine translation. L4

4CSPL2071: Web Technology

CO1: Understand the fundamentals of web technologies and internet protocols. L1
CO2 : Gain proficiency in client-side and server-side scripting languages for web development.L2
CO3: Learn about web frameworks and architectures for building scalable web applications. L3
CO4:. Explore web security principles and best practices for secure web development. L3
CO5: Develop skills in web performance optimization techniques for improving user experie

4CSPL2051: Mobile Application Development

CO1: Understand the fundamentals of mobile application development for Android and iOS platforms. L1
CO2: Gain proficiency in native app development using Java (for Android) and Swift (for iOS). L2
CO3: Learn cross-platform mobile development using frameworks like Flutter for Android and iOS. L3
CO4: Explore mobile app testing, debugging, and deployment strategies. L3
CO5: Develop practical skills to design, develop, test, and deploy mobile applications for real-world scenarios. L4

4CSGC3121 - Soft Computing (Fuzzy, Genetic, Ontologies)

CO1: Understand the fundamental principles and techniques of soft computing, including fuzzy logic, genetic algorithms, and ontologies. L1
CO2: Analyze and apply fuzzy logic concepts for dealing with uncertainty and imprecision in decision- making and problem-solving. L2
CO3: Design and implement genetic algorithms for optimization problems and search space exploration. L3
CO4: Explore the use of ontologies for knowledge representation and reasoning in intelligent systems. L3
CO5: Apply soft computing techniques to solve real-world problems across various domains such as engineering, finance, and healthcare. L4

4CSPL3091-No-SQL Database

CO1: Understand the fundamental concepts and principles of NoSQL databases, including their advantages over traditional relational databases. L1
CO2: Gain practical knowledge of Hadoop Distributed File System (HDFS) and its deployment in various configuration. L2
CO3: Develop proficiency in using Apache Hive for data warehousing and analysis, including creating tables, querying data, and integrating with other big data processing frameworks. L3
CO4: Master the configuration and usage of HBase for storing and managing large-scale distributed data with efficient data modeling techniques. L3
CO5: Acquire comprehensive knowledge of MongoDB, including its data model, replication mechanisms, query language, and scalability features. L4

4CSPL3101 - Applied Machine Learning

CO1: Gain a comprehensive understanding of the principles and techniques of applied machine learning. L1
CO2: Develop proficiency in preprocessing, analyzing, and visualizing data for machine learning tasks. L2
CO3: Apply supervised and unsupervised learning algorithms to solve real-world problems in various domains L3
CO4: Evaluate and compare the performance of machine learning models using appropriate evaluation metrics. L3
CO5: Design and implement end-to-end machine learning pipelines for tasks such as classification, regression, and clustering. L4

4CSGC3131: System Security

CO1: Understand the fundamental concepts and principles of system security. L1

CO2: Gain proficiency in access control mechanisms and network security protocols. L2
CO3: Learn to secure operating systems and configure security settings. L3
CO4: Develop skills in security management, incident response planning, and compliance monitoring. L3
CO5: Apply system security techniques to mitigate security threats and vulnerabilities. L4

4CSGC3141: ETHICAL HACKING

CO1: Demonstrate an understanding of ethical hacking concepts, methodologies, and techniques L4
CO2 Perform reconnaissance, scanning, enumeration, exploitation, and post-exploitation techniques using ethical hacking tools - L4
CO3: Identify and exploit common vulnerabilities in systems and networks. L2
CO4: Analyze security weaknesses and recommend remediation measures based on ethical hacking assessments – L3
CO5: Apply ethical hacking principles and practices to enhance the overall security posture of organizations. – L3

4CSGC3151- Malware Analysis

CO1: Demonstrate an understanding of malware analysis concepts, techniques, and tools. L4
CO2: Perform static and dynamic analysis of malware samples to identify malicious behavior L3
CO3: Extract and analyze indicators of compromise (IOCs) for threat detection and mitigation L4
CO4: Apply behavioral analysis and reverse engineering techniques to understand malware behavior. L3
CO5: Develop practical skills in malware triage, incident response, and threat intelligence analysis. L3

4CSPL3111- Object Oriented Analysis Design

CO1: To learn a readable, pragmatic, safe, and interoperable programming language - L2
CO2: To think about nullability from the start by integrating nullability into the type system L3
CO3: Acquire programming skills in Kotlin L3
CO4: Understanding the Android development through Kotlin L2
CO5: To aid scalability in large-scale software development L2

4CSPL3121: Web Technology Frameworks

CO1: Students will be able to Develop a solid understanding of the MERN stack and how it can be used to build scalable, high-performance full-stack web applications. L1
CO2: Students will Gain hands-on experience with building web applications using the MERN stack, including setting up a development environment, creating and connecting to databases, building APIs, and integrating frontend and backend code. L5
CO3: Students will be able to learn best practices for building secure, performant, and maintainable web applications including implementing authentication and authorization, optimizing database queries, and using tools for debugging an testing. L3
CO4: Students will be able to understand how to design and implement scalable, distributed web applications that can handle large amounts of traffic and users, and deploy these applications to the cloud using popular cloud services. L3
CO5: Students will be able to Acquire the skills and knowledge necessary to be able to build real-world web applications using the MERN stack and gain confidence in their ability to create high-quality, professional-grade software. L5

4CSGC3161-Wireless Technologies

CO1 : Demonstrate an understanding of wireless communication principles and protocols. L4
CO2 Configure and secure wireless networks using Wi-Fi, Bluetooth, and cellular standards. L3
CO3 Design and deploy wireless sensor networks (WSNs) for monitoring and control applications. L3
CO4 Analyze and optimize the performance of wireless communication systems. L4
CO5 Explore emerging trends in wireless technologies and their applications in real-world scenarios. L3

4CSGC3171 - Multimedia Networking

CO1 Demonstrate an understanding of multimedia networking principles and protocols. L4
CO2 Configure and troubleshoot multimedia streaming solutions and QoS mechanisms. L3
CO3 Design and implement multimedia security solutions for protecting multimedia content. L3
CO4 Analyze multimedia traffic patterns and performance metrics in network simulations. L4
CO5 Explore multimedia applications and evaluate their impact on networked systems L3

CPSES1011: MAKING WITH ELECTRONICS

CO1: Demonstrate the interfacing of basic input and output devices using Arduino. L2
CO2: Explain the working principles of various sensors and renewable energy sources. L2
CO3: Apply the understanding of Arduino programming by interfacing sensors and communication devices. L3
CO4: Demonstrate the interfacing of basic input and output devices using Raspberry Pi. L2
CO5: Analyze and build a real-time application employing Arduino / Raspberry Pi. L4, L3

4ENME2131: Fundamentals of Robotics and Applications

CO1 -Comprehend the historical evolution, classifications, and societal ramifications of robotics [L2]
CO2 -Analyze the configurations, motion dynamics, and control mechanisms of robots. [L4]
CO3 - Analyze different robot drive systems and end effectors, determining their appropriateness for specific tasks. [L3]
CO4 -Apply sensor selection principles and interpret sensor data for effective integration into robotic systems. [L3]
CO5 - Assess and critique the practical applications of robotics across diverse industrial domains. [L4]

4ENCV2101: REMOTE SENSING & APPLICATIONS

CO1 Understand the importance of Remote Sensing L1
CO2 Understand the systems of Sensors and platforms L1
CO3 Understand the systems of Image Analysis L1
CO4 Interpret the aerial photographs and satellite imageries L2
CO5 Apply RS technologies in various fields of engineering and social needs & Create a feasible solution in the different fields of application of RS L3

CPSSE1021: Project Management Fundamentals

CO1 Understand the fundamental concepts of Project Management and use them in their professional career [L1].
CO2 Demonstrate their preparedness to manage any project in a professional manner [L1].
CO3 Apply the best practices of Project Management which will ensure their success professional life [L2].

CPSSE2021: Project Management Advanced

CO1 Understand certain detailed concepts in Project Management and Business Analysis and use them in their professional career [L1].
CO2 Demonstrate their preparedness to manage any project in a professional manner [L1].
CO3 Apply the best practices of Project Management which will ensure their success in their professional life[L2].

CPSSE1031: Qualitative Research

CO1 Illustrate the different components of research process, research design and research problem. (L4)
CO2 Understand and develop skills in relation to qualitative research and will serve as a foundation for possible qualitative research projects at a graduate and postgraduate level. (L2)
CO3 Analyze qualitative data, using techniques such as Grounded theory, IPA, Narrative analysis, Thematic analysis and Content analysis. (L4)
CO4 Compile research reports addressing empirical and analytical problems. (L6)