

SCHOOL OF ENGINEERING
DEPARTMENT OF CSE (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)

ACADEMIC YEAR 2025-26

YEAR: I

SEMISTER: I

REGULATION: R25

Course Name: Matrices and Calculus

Course Code: 25MA101BS

CO1	Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations
CO2	Find the Eigen values and Eigen vectors
CO3	Reduce the quadratic form to canonical form using orthogonal transformations.
CO4	Solve the applications of the mean value theorems.
CO5	Find the extreme values of functions of two variables with/without constraints.
CO6	Evaluate the multiple integrals and apply the concept to find areas, volumes.

Course Name: Advanced Engineering Physics

Course Code: 25PH102BS

CO1	Analyze crystal structures , identify defects ,and apply XRD and SEM techniques for material characterization.
CO2	Apply quantum mechanical principles to explain particle behavior and energy band formation in solids
CO3	Classify magnetic and dielectric materials and explain their properties
CO4	Explain the principles of lasers and fiber optics and their applications in communication and sensing. Understand quantum computing concepts
CO5	Classify magnetic and dielectric materials and explain their properties

Course Name: Engineering Drawing and Computer Aided Drafting

Course Code: 25ME103ES

CO1	Understand and apply the principles of orthographic and isometric projections.
CO2	Create sectional views and dimensioned drawings using BIS standards.
CO3	Use CAD software to generate 2D engineering drawings.
CO4	Visualize and construct solid models from 2Dviews.
CO5	Interpret and produce engineering drawings of mechanical components and assemblies.
CO6	Demonstrate drafting skills for practical and industrial applications.

Course Name: Basic Electrical Engineering

Course Code: 25EE104ES

CO1	Understand and analyze basic Electrical circuits
CO2	Study the working principles of Electrical Machines and Transformers
CO3	Introduce components of Low Voltage Electrical Installations.

Course Name: Programming for Problem Solving

Course Code: 25EE105ES

CO1	Understand the basics of the C language, to write and analyze simple programs
CO2	Apply top down design principles using functions and pointers to develop modular and reusable C programs
CO3	Utilize arrays and strings effectively in C programming for data storage
CO4	Implement recursive solutions and work with user-defined data types for complex data management
CO5	Understand the file operations and apply fundamental searching and sorting problems to process data effectively

Course Name: Advanced Engineering Physics Lab

Course Code: 25PH106BS

CO1	Demonstrate working knowledge of laser systems and determine their characteristics.
CO2	Demonstrate working knowledge of optical fiber parameters through experimental study.
CO3	Determine key electrical, magnetic, and optical properties of semiconductors and other functional materials.
CO4	Characterize semiconductors using Hall effect and energy gap measurement techniques.
CO5	Apply scientific methods for accurate data collection, analysis, and technical report writing.

Course Name: Programming for Problem Solving Lab

Course Code: 25CS107ES

CO1	Formulate the algorithms for simple problems
CO2	Translate given algorithms to a working and correct program
CO3	Correct syntax errors as reported by the compilers
CO4	Identify and correct logical errors encountered during execution
CO5	Represent and manipulated at a with arrays ,strings and structures

Course Name: IT Workshop

Course Code: 25CS108ES

CO1	Perform Hardware troubleshooting
CO2	Understand Hardware components and interdependencies
CO3	Safeguard computer systems from viruses/worms
CO4	Document/Presentation preparation
CO5	Perform calculations using spreadsheets

Course Name: Basic Electrical Engineering Lab

Course Code: 25EE109ES

CO1	After learning the contents of this paper the student must be able to
CO2	Verify the basic Electrical circuits through different experiments.
CO3	Evaluate the performance calculations of Electrical Machines and Transformers through various testing methods.
CO4	Analyze the transient responses of R,L and C circuits for different input conditions.

YEAR: I**SEMISTER: II****REGULATION: R25**

Course Name: Ordinary Differential Equations and Vector Calculus

Course Code: 25MA201BS

CO1	Identify whether the given differential equation of first order is exact or not
CO2	Solve higher differential equation and apply the concept of differential equation to real world problems.
CO3	Use the Laplace Transforms techniques for solving Ordinary Differential Equations.
CO4	Evaluate the Line, Surface and Volume integrals and converting them from one to another

Course Name: Engineering Chemistry

Course Code: 25CH202BS

CO1	Students will be able to understand the fundamental properties of water and its applications in both domestic and industrial purposes.
CO2	Students will gain basic knowledge of electrochemical processes and their relevance to corrosion and its control methods.
CO3	Students will comprehend the significance and practical applications of batteries and various energy sources, enhancing their potential as future engineers and entrepreneurs.
CO4	Students will learn the basic concepts and properties of polymers and other engineering materials.
CO5	Students will be able to apply the principles of UV-Visible, IR spectroscopy and Raman spectroscopy in analyzing pollutants in dye industries and biomedical application.

Course Name: English for Skill Enhancement

Course Code: 25EN203ES

CO1	Choose appropriate vocabulary in the oral and written communication.
CO2	Demonstrate their understanding of the rules of functional grammar and sentence structures.
CO3	Develop comprehension skills from known and unknown passages.
CO4	Write paragraphs, essays, précis and draft letters.
CO5	Write abstracts and reports in various contexts.

Course Name: Electronic Devices and Circuits

Course Code: 25EC204ES

CO1	Analyze the electrical characteristics and models of semiconductor diodes and apply the min rectifier and clipping circuits.
CO2	Evaluate the operation and configurations of Bipolar Junction Transistors (BJTs) and analyze their input and output characteristics.
CO3	Design appropriate biasing networks for BJTs and determine the operating point for amplifier applications.
CO4	Analyze transistor amplifier circuit's using h-parameter models and assess performance for various configurations.
CO5	Analyze the structure, working, and characteristics of JFETs, MOSFETs, and advanced devices like FinFETs and CNTFETs, and compare modern device technologies.

Course Name: Data Structures

Course Code: 25CS205HS

CO1	Understand the concept of ADT.
CO2	Ability to select the data structures that efficiently model the information in a problem.
CO3	Ability to assess efficiency trade-offs among different data structure implementations or combinations.
CO4	Implement and know the application of algorithms for sorting and pattern matching.
CO5	Design programs using a variety of data structures, including hash tables, binary and general

Course Name: Engineering Chemistry Lab

Course Code: 25CH206BS

CO1	Students will develop practical skills through hands-on chemistry experiments relevant to engineering.
CO2	Students will learn to determine important parameters such as water hardness and the corrosion rate of mild steel under various conditions.
CO3	Students will be able to apply techniques like conductometry, potentiometry, and pH metry to determine concentrations or equivalence points in acid-base reactions
CO4	Students will gain experience in synthesizing polymers such as Bakelite and Nylon
CO5	Students will understand the working principle of colorimetry and the relationship between absorbance and concentration (Beer

Course Name: Data Structures Lab

Course Code: 25CS207ES

CO1	Appreciate the importance of structure and Abstract data type, and their basic usability in different applications.
CO2	Able to implement linear and non-linear data structures using linked lists.
CO3	Able to understand and apply various data structures such as stacks, queues, trees, graphs etc. to solve various computing problems.
CO4	Able to implement various kinds of searching and sorting techniques, and decide when to choose which technique.
CO5	Able to identify and use a suitable data structure and algorithm to solve a real world problem.

Course Name: English Language and Communication Skills Lab

Course Code: 25EN208HS

CO1	Listen actively and identify important information in spoken texts
CO2	Interpret the speech and infer the intention of the speaker
CO3	Improve their accent for intelligibility
CO4	Speak fluently with clarity and confidence
CO5	Use the language in real life situations

Course Name: Engineering Workshop

Course Code: 25ME209ES

CO1	Understand the basic manufacturing processes and operations.
CO2	Use hand tools and equipment safely and efficiently.
CO3	Perform basic operations in carpentry, fitting, welding, sheet metal work, and machining
CO4	Read and interpret work shop drawings
CO5	Develop team work, time management, and quality awareness in a workshop environment.

CO1	Student should be able to understand the basic concepts scripting and the contributions of scripting language
CO2	Examine the core data structures like lists, dictionaries, tuples and sets in Python to store, process and sort the data.
CO3	Identify the external modules and import specific methods form them
CO4	Demonstrate proficiency in handling Strings and File Systems.
CO5	Ability to explore python especially the object oriented concepts, and the built in objects of Python

YEAR: II**SEMESTER: I****REGULATION: R25**

Course Name: MATHEMATICAL AND STATISTICAL FOUNDATIONS

Course Code: 25MA301BS

CO1	Apply the number theory concepts to cryptography domain.
CO2	Apply the concepts of probability and distributions to some case studies.
CO3	Correlate the material of one unit to the material in other units.
CO4	Resolve the potential misconceptions and hazards in each topic of study.
CO5	Fit the curve, correlation and regression for the given data.

Course Name: COMPUTER ORGANIZATION AND ARCHITECTURE

Course Code: 25CS302PC

CO1	Apply Boolean algebra and digital logic principles to design and simplify logic circuits.
CO2	Design combinational and sequential circuits.
CO3	Analyze computer operations at the register-transfer level.
CO4	Evaluate CPU architecture and control unit design.
CO5	Understand memory hierarchy and I/O organization.

Course Name: OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Course Code: 25CS303PC

CO1	Identify fundamental behavior of object-oriented programming concepts and their application.
CO2	Apply the inheritance concept for code reusability.
CO3	Apply multithreading concepts for inter-process communication mechanisms.
CO4	Apply GUI concepts for user-friendly applications.
CO5	Make use of Swing concepts for integrating event handling mechanisms.

Course Name: SOFTWARE ENGINEERING

Course Code: 25CS304PC

CO1	Analyze and evaluate software process models and frameworks.
CO2	Create structured Software Requirements Specifications (SRS) documents for real-time problems.
CO3	Design and develop software architecture to choose an appropriate design model for appropriate applications.
CO4	Evaluate different testing strategies.
CO5	Classify different risks and quality metrics.

Course Name: DATA BASE MANAGEMENT SYSTEMS

Course Code: 25CS305PC

CO1	Able to understand the basic concepts of database systems
CO2	Able to develop SQL queries
CO3	Able to understand file organization
CO4	Able to understand the basic concepts of database systems
CO5	Able to develop SQL queries

Course Name: COMPUTATIONAL MATHEMATICS LAB

Course Code: 25MA306PC

CO1	Develop the code to find the Eigen values and Eigen Vectors using Python/MATLAB
CO2	Develop the code find solution of Algebraic and Transcendental Equations using Bisection and Newton – Raphson methods in Python/MATLAB
CO3	Develop the code find solution of Linear system of equations using Gauss – Seidal and Gauss – Jacobi methods in Python/MATLAB
CO4	Write the code to solve problems of First-Order ODEs and discussing applications (Newton's law of cooling & Law of natural growth & decay) in Python/MATLAB
CO5	Write the code to solve problems of homogeneous and non – homogeneous second order linear differential equations with constant coefficients in Python/MATLAB

Course Name: OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

Course Code: 25CS307PC

CO1	Implement the Java Collection Framework to solve real-world problems.
CO2	Implement programs using abstract classes and object-oriented principles.
CO3	Implement inter process communication using multithreading concepts.
CO4	Develop a Java application with exception handling.
CO5	Design and build GUI applications.

Course Name: SOFTWARE ENGINEERING LAB

Course Code: 25CS308PC

CO1	Apply software engineering concepts to formulate Software Requirement Specification (SRS) documents for real-world applications.
CO2	Design software system models using appropriate design techniques and CASE tools.
CO3	Prepare software configuration management and risk management plans for project execution.
CO4	Awareness of testing problems and will be able to develop a simple testing report.
CO5	Evaluate software quality by designing and applying white-box and black-box testing techniques.

Course Name: DATABASE MANAGEMENT SYSTEMS LAB

Course Code: 25CS309PC

CO1	Apply E-R modeling and relational design techniques to construct database schemas.
CO2	Apply normalization and SQL (DDL, DML) commands to create and manage database structures and data.
CO3	Apply SQL queries including joins, sub queries, and aggregate functions to retrieve and manipulate data effectively.
CO4	Analyze database queries using nested queries, correlated sub queries, and views for efficient data retrieval.
CO5	Analyze and implement database applications using procedures, cursors, and triggers.

Course Name: SKILL DEVELOPMENT COURSE

Course Code: 25CS310SD

CO1	Analyze how to import data into Tableau.
CO2	Apply tableau concepts for Dimensions and Measures.
CO3	Develop Programs to map Visual Layouts and Graphical Properties.
CO4	Create a dashboard that links multiple visualizations.
CO5	Apply graphical user interfaces to create Frames for real world problems.

YEAR: II

SEMISTER: II

REGULATION: R25

Course Name: DISCRETE MATHEMATICS

Course Code: 25CS301PC/25CS401PC

CO1	Understand and construct precise mathematical proofs.
CO2	Apply logic and set theory to formulate precise statements.
CO3	Analyze and solve counting problems on finite and discrete structures.
CO4	Describe and manipulate sequences in combinatorics.
CO5	Apply graph theory in solving computing problems.

Course Name: OPERATING SYSTEMS

Course Code: 25CS402PC

CO1	Understand and construct precise mathematical proofs.
CO2	Apply logic and set theory to formulate precise statements.
CO3	Analyze and solve counting problems on finite and discrete structures.
CO4	Describe and manipulate sequences in combinatorics.
CO5	Apply graph theory in solving computing problems.

Course Name: ALGORITHMS DESIGN AND ANALYSIS

Course Code: 25CS403PC

CO1	Analyze algorithms by measuring time and space complexity.
CO2	Device divide-and-conquer, greedy method, backtracking and dynamic programming solutions.
CO3	Apply disjoint sets and heaps data structures in different algorithmic strategies.
CO4	Solve real-world problems by identifying appropriate algorithmic techniques.
CO5	Analyze and classify problems into P and NP classes.

Course Name: MACHINE LEARNING

Course Code: 25CS405PC

CO1	Understand basic concepts of machine learning.
CO2	Gain the knowledge of feature engineering and model evaluation techniques.
CO3	Identify an appropriate model for the real-world problem.
CO4	Distinguish between supervised, unsupervised and semi-supervised learning.
CO5	Understand neural networks, deep learning, and reinforcement learning.

Course Name: INNOVATION AND ENTREPRENEURSHIP

Course Code: 25MS406HS

CO1	Understand the entrepreneurship and the entrepreneurial process and its significance in economic development
CO2	Assess the problem from an industry perspective and generate solutions using the design thinking principles.
CO3	Assess market competition, estimate market size, and develop a prototype.
CO4	Analyze Business and financial planning models and Go-to-Market strategies.
CO5	Able to build a start-up, register IP and identify funding opportunities.

Course Name: OPERATING SYSTEMS LAB

Course Code: 25CS407PC

CO1	Implement different CPU scheduling algorithms.
CO2	Develop programs using UNIX/Linux system calls.
CO3	Implement deadlock avoidance algorithm.
CO4	Apply Interprocess communication and synchronization mechanisms to solve real-world problems.
CO5	Implement memory management techniques and page replacement algorithms.

Course Name: COMPUTER NETWORKS LAB

Course Code: 25CS408PC

CO1	Implement data link layer protocols functionalities.
CO2	Implement error detection techniques.
CO3	Implement and analyze routing and congestion issues in network design.
CO4	Implement encoding and decoding techniques used in the presentation layer.
CO5	Simulate different network tools.

Course Name: MACHINE LEARNING LAB

Course Code: 25CS409PC

CO1	Implement statistical measures on various data sets.
CO2	Apply basic Python libraries on data analysis.
CO3	Implement and analyze different machine learning algorithms
CO4	Build predictive models from data sets.
CO5	Apply machine learning techniques for real-world applications.

Course Name: SKILL DEVELOPMENT COURSE

Course Code: 25CS410SD

CO1	Build a custom website using HTML, CSS, Bootstrap, and basic JavaScript.
CO2	Implement advanced features of JavaScript and JDBC.
CO3	Develop server-side applications using Java technologies.
CO4	Develop server-side implementation using Node.js.
CO5	Design a Single Page Application using React.

CO1	Understand nature, scope and related fields of Indian knowledge system.
CO2	Demonstrate the scientific literature available in ancient Indian traditions
CO3	Understanding the application of Bharatiya Jnana Parampara
CO4	Understand Indian approach towards Wellbeing
CO5	Appreciate vast contribution of ancient Indian researchers, engineers, scientists and architects to the modern world

YEAR: III**SEMESTER: I****REGULATION: R22**

Course Name: : DESIGN AND ANALYSIS OF ALGORITHMS

Course Code: 22CS501PC

CO1	Describe different types of Algorithms
CO2	Estimate performance of an Algorithm
CO3	Compare different types of design techniques of Algorithms
CO4	Choose Appropriate design techniques or Algorithms for solving problems
CO5	Develop Algorithms for real time scenarios

Course Name: Computer Networks

Course Code: 22CS502PC

CO1	Define Network and its components
CO2	Illustrate the functionality of OSI and TCP/IP reference models
CO3	Compare different network layer protocols
CO4	Evaluate Architecture for Application layer protocols
CO5	Choose appropriate protocol for desired communication service

Course Name: Machine Learning

Course Code: 22DS501PC

CO1	Distinguish between, supervised, unsupervised and semi-supervised learning
CO2	Understand algorithms for building classifiers applied on datasets of non-linearly separable classes
CO3	Understand the principles of evolutionary computing algorithms
CO4	Design an ensembler to increase the classification accuracy
CO5	Distinguish between, supervised, unsupervised and semi-supervised learning

Course Name: Business Economics & Financial Analysis

Course Code: 22SM504MS

CO1	Understand the relative importance of Business Economics and structure of Business Firms ranging from types, formation, entry and exit from markets and output decisions.
CO2	Be equipped with the tools for analyzing Demand and costs as well as in forecasting product demand and to develop critical and integrative thinking in the Analysis of consumer behavior.
CO3	Able to identify key domestic as well as global economic factors and analyze the impact of fast changing global economic factors with domestic macroeconomic policies
CO4	To develop the students to understand the accounting language and to have a basic Understanding of preparation of financial statement.
CO5	To assess the company profitability and financial position by using financial tools and techniques and to explore opportunities for future merger and acquisition and expansion

Course Name: Introduction to Data Science

Course Code: 22AM512PE

CO1	Able to Understand data science basics, statistical techniques and R programming
CO2	Able to identify data attributes, apply statistical description and interpret central tendency, dispersion
CO3	Able to create, manipulate, sort, and convert vectors, matrices, arrays, factors, data frames, lists in R
CO4	Able to solve different problems by applying conditionals, control flows, iterative programming and functions in R
CO5	Able to create charts and graphics in R and apply linear and multiple linear regression for data visualization and modeling

Course Name: Computer Networks Lab

Course Code: 22DS503PC

CO1	Implement data link layer framing methods
CO2	Analyze error detection and error correction codes.
CO3	Implement and analyze routing and congestion issues in network design.
CO4	Implement Encoding and Decoding techniques used in presentation layer
CO5	To be able to work with different network tools

Course Name: Advanced English Communication Skills lab

Course Code: 22EN508HS

CO1	Develops confidence to use relevant vocabulary, using apt kinesics or body language in communication
CO2	Infer the meaning of the text easily through comprehension techniques like, skimming, scanning and effective reading through proper vocabulary
CO3	Analyze the writing skills through letters, reports and resume writing from the text and use for all professional settings
CO4	Gather ideas, information and organize them relevantly in making presentations
CO5	Self-assured to organize and deliver discussions, presentations and strategies to face the interviews effectively

Course Name: Intellectual Property Rights

Course Code: 22MC509IP

CO1	Able to Define different types of Intellectual Property Rights.
CO2	Able to Classify different Intellectual Property Rights
CO3	Able to Identify importance of Trademark & Copyright Laws.
CO4	Able to Explain importance of Patents, Trade Secret Laws
CO5	Able to Create new Intellectual Properties

Course Name: Skill Development Course

Course Code: 22CS506PC

CO1	Implements Flutter Widgets and Layouts
CO2	Responsive UI Design and with Navigation in Flutter
CO3	Create custom widgets for specific UI elements and also Apply styling using themes and custom styles.
CO4	Design a form with various input fields, along with validation and error handling
CO5	Fetches data and write code for unit Test for UI components and also animation

Course Name: Knowledge Representation and Reasoning

Course Code: 22AM601PC

CO1	Analyze and design knowledge based system intended for computer implementation
CO2	Acquire theoretical knowledge about principles for logic-based representation and reasoning
CO3	Ability to understand knowledge engineering process
CO4	Ability to implement production systems, frames, inheritance systems and approaches to handle uncertain or incomplete knowledge
CO5	Ability to understand knowledge soup, Sharing Ontologies

Course Name: Data Analytics

Course Code: 22AM602PC

CO1	Able to Design Data Architecture
CO2	Able to Understand various Data Sources
CO3	Able to carry out data analysis/statistical analysis
CO4	Able to understand the impact of data analytics for business decisions and strategy.
CO5	Able to carry out standard data Visualization and formal inference procedures.

Course Name: Natural Language Processing

Course Code: 22AM603PC

CO1	Apply NLP preprocessing techniques such as lemmatization and POS tagging
CO2	Demonstrate NLP algorithms for text processing and morphology analysis
CO3	Understand linguistic foundations of NLP systems
CO4	Analyze semantics and pragmatics for text processing
CO5	Explore NLP research applications such as text classification and spam filtering

Course Name: SOFTWARE TESTING METHODOLOGIES (Professional Elective – II) Course Code: 22AM621PE

CO1	Understand purpose of testing and path testing
CO2	Understand strategies in data flow testing and domain testing
CO3	Develop logic-based test strategies
CO4	Understand graph matrices and its applications
CO5	Implement test cases using any testing automation tool

Course Name: Fundamentals of Internet Things (Open Elective-I)

Course Code: 22EC611OE

CO1	Know basic protocols in sensor networks
CO2	Program and configure Arduino boards for various designs
CO3	Python programming and interfacing for Raspberry Pi-B35
CO4	Design IoT applications in different domains
CO5	Recent developments in IoT

Course Name: Natural Language Processing Lab

Course Code: 22AM604PC

CO1	Develop solutions for finding structure of words and document
CO2	Interpret algorithms for POS triggering word sense Disambiguation
CO3	Show sensitivity to linguistic phenomena and an ability to model them with formal grammar
CO4	Understand and carry out proper experimental methodology for training and evaluating empirical NLP system
CO5	Able to design, implement and analyze NLP algorithm

Course Name: Data Analytics Lab

Course Code: 22AM605PC

CO1	Develop code for Data handling techniques.
CO2	Implement analytics for handling data.
CO3	Understand linear regression and logistic regression
CO4	Able to Implement Time Series, supervised and unsupervised.
CO5	Able to Implement visualization techniques using different graphs

Course Name: Industrial Oriented Mini Project/ Internship/ Skill

Course Code: 22CS606PC

CO1	Graduates will be able to identify and define problems in the area of Computer science
CO2	Graduates will be able to explain and illustrate their practical skills needed to understand and
CO3	Modify problems related to programming and designing.
CO4	Graduates will get a chance to apply current technologies and develop applications for the problems
CO5	Graduates will get opportunities to practice as teams on multidisciplinary projects with effective writing and communication skills

Course Name: Environmental Science

Course Code: 22MC609ES

CO1	Explain the structure and functions of ecosystems and understand their role in ecological balance and sustainability.
CO2	Classify natural resources, identify the impact of human activities on them, and explain the importance of renewable energy resources.
CO3	Explain biodiversity, identify the threats to it, and describe ways to conserve it for sustainable development.
CO4	Classify major types of environmental pollution, apply suitable pollution control and treatment technologies, and develop awareness on international agreements.
CO5	Explain environmental laws and Environmental Impact Assessment (EIA), in promoting sustainable development.

YEAR: IV

SEMISTER: I

REGULATION: R22

Course Name: Deep Learning

Course Code: 22AM701PC

CO1	Understand machine learning basics and neural networks
CO2	Understand optimal usage of data for training deep models
CO3	Apply CNN and RNN models for real-world data
CO4	Evaluate deep models
CO5	Develop deep models for real-world problems

Course Name: Nature Inspired Computing

Course Code: 22AM702PC

CO1	Familiar with Evolutionary Computing algorithms
CO2	Understand scope of neurocomputing
CO3	Compare different Ant Colony Optimization algorithmic models.
CO4	Understand the scope of artificial immune systems
CO5	Tackle different real world problems

Course Name: SCRIPTING LANGUAGES (Professional Elective – III)

Course Code: 22DS501PC

CO1	Understand the fundamentals of Ruby programming, Ruby on Rails, and RubyTk for developing basic web and GUI applications.
CO2	Gain knowledge of Ruby's internal architecture, memory management, and techniques for extending and embedding Ruby.
CO3	Understand scripting language concepts and develop basic programs using Perl.
CO4	Apply advanced Perl features to build efficient, secure, and internet-aware applications.
CO5	Develop TCL/Tk applications using programming concepts, GUI components, and event-driven programming.

Course Name: SEMANTIC WEB (Professional Elective – IV)

Course Code: 22AM743PE

CO1	Understand the characteristics of the semantic web technology
CO2	Understand the concepts of Web Science, semantics of knowledge resource and ontology
CO3	Describe logic semantics and inference with OWL.
CO4	Use ontology engineering approaches in semantic applications
CO5	Learn about web graph processing for various applications such as search engine, community detection

Course Name: Professional Practice, Law & Ethics

Course Code: 22SM702MS

CO1	Practice ethics and rule of the land in their profession
CO2	Follow the principles and elements of legal contracts
CO3	Able to resolve disputes pertaining to arbitration, reconciliation
CO4	Aware of intellectual property loss

Course Name: Project Stage - I

Course Code: 22CS705PC

CO1	Graduates will be able to identify and define problems in the area of Computer science
CO2	Graduates will be able to explain and illustrate their practical skills needed to understand and
CO3	modify problems related to programming and designing.
CO4	Graduates will get a chance to apply current technologies and develop applications for the problems
CO5	Graduates will get opportunities to practice as teams on multidisciplinary projects with effective writing and communication skills

YEAR: IV

SEMISTER: I I

REGULATION: R22

Course Name: Web Security (Professional Elective – V)

Course Code: 22AM854PE

CO1	Understand the Web architecture and applications
CO2	Understand client side and service side programming
CO3	Understand how common mistakes can be bypassed and exploit the application
CO4	Identify common application vulnerabilities

Course Name: Cognitive Computing (Professional Elective – VI)

Course Code: 22AM864PE

CO1	Understand cognitive computing
CO2	Plan and use the primary tools associated with cognitive computing.
CO3	Plan and execute a project that leverages cognitive computing.
CO4	Understand and develop the business implications of cognitive computing.

Course Name: DEVOPS (Open Elective – III)

Course Code: 22DS501PC

CO1	Understand the various components of DevOps environment.
CO2	Identify Software development models and architectures of DevOps
CO3	Use different project management and integration tools.
CO4	Select an appropriate testing tool and deployment model for project.

Course Name: Project Stage – II including Seminar

Course Code: 22CS802PC

CO1	Graduates will be able to identify and define problems in the area of Computer science
CO2	Graduates will be able to explain and illustrate their practical skills needed to understand and
CO3	modify problems related to programming and designing.
CO4	Graduates will get a chance to apply current technologies and develop applications for the problems
CO5	Graduates will get opportunities to practice as teams on multidisciplinary projects with effective writing and communication skills