DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

REGULATIONS: MLRS-R22

I Sem

Subject: Matrix Algebra and Calculus **Course code: 2210001**

Course Outcomes.

1. Recall the concepts of rank, Echelon form, Normal form, and the properties of non-singular matrices.
2. Explain the process of finding Eigen values and eigenvectors of a matrix and their role in diagonalization.
3. Relate Beta and Gamma functions to standard integrals and solve related problems.
4. Apply Euler's theorem and compute total derivatives for multivariable functions.
5. Understand the methods for changing variables in double and triple integrals, including transformations to polar, spherical, and cylindrical coordinates.

Subject: Engineering Chemistry **Course code: 2210501**

Course Outcomes.

1. Define the algorithms and draw flowcharts for solving Mathematical and Engineering problems.
2. Construct programs for decision structures and loops.
3. Interpret various types of functions, arrays and strings for complex problem solving.
4. Illustrate the dynamic memory allocation, structures, unions and enumerations to solve problems.
5. Apply file input and output functions to develop integrated and functional programs.

Subject: Basic Electrical Engineering **Course code: 2210201**

Course Outcomes.

1. Understand the utilization of various semiconductor components.
2. Learn about different electronic devices and how they are used in everyday life.
3. Assess the performance of BJT in different configurations.
4. Explain how the Field effect transistors are used in to design of electronic circuits
5. Acquire the knowledge about the role of special purpose devices in day-to-day life.

Subject: Engineering Drawing Practice **Course code: 2210371**

Course Outcomes.

1. Illustrate bureau of Indian standards conventions of engineering drawing with basic concepts, ideas and methodology for different geometries and their execution

2. Apply for development of multi-aspect sketches, additional and sectional view

3. Construct parabolic, Hyperbolic and elliptical curves for profiles likes buildings and bridges Build Cyclical and involutes profiles for developing new products like gears and other engineering applications

4. Explain the concept of projection of solids inclined to both the planes for interpretation of different views and orthographic projection concepts in solid modelling.

5. Recall the orthographic projection concepts in solid modeling for use in conversation to isometric and Vice-versa.

Subject: Elements of Computer Science and Engineering **Course code: 2210518**

Course Outcomes.

1. Know the working principles of functional units of a basic Computer

2. Make use of data structures and algorithms for problem solving in real time applications

3. Know the need and types of operating system, database systems.

4. Comprehend the importance of networks, the internet, the World Wide Web, and cyber security in modern technology

5. Understand Autonomous systems, the application of artificial intelligence.

Subject: Engineering Chemistry Laboratory **Course code: 2210072**

Course Outcomes.

1. Determination of parameters like hardness of water by complex metric method and determine the given Fe amount by volumetric analysis.

2. Make use of methods such as conductometry, potentiometry in order to find out the concentrations or equivalence points of acids and bases .

3. prepare polymers like Bakelite and Thiokol rubber from different monomers.

4. Estimate the viscosity of lubricant oils to know its properties for the proper lubrication of machinery in industries and determine the acid value of lubricating oils.

5. Learn about construct, functioning and applications of virtual lab experiments

Subject: Programming for Problem Solving Lab **Course code:** 2210571

Course Outcomes.

1. Develop the algorithms and draw flowcharts for solving Mathematical and Engineering problems.

2. Identify, compile and debug programs in C-language to analyze the result experiments.

3. Construct programs involving decision structures and loops for specifying iteration, understand which allows code to be executed repeatedly

4. Compare call by value and call by reference concepts to provide appropriate communication between functions.

5. Apply the working of arrays to implement mathematical vectors and matrices, as well as other kinds of rectangular tables.

Subject: Basic Electrical Engineering Laboratory Course code: 2210271

Course Outcomes.

1. Identify various passive (resistors, capacitors, inductors) and active components (diodes, transistors, ICs) and understand their applications

2. Make use of measuring instruments such as voltmeters, ammeters, and multimeters to accurately measure voltage, current, and other electrical parameters

3. Analyze the truth tables of basic logic gates, identify digital and analog ICs, and explore available software tools for electronics and communication applications

4. Utilize function generators to generate various signals and study their characteristics using CRO & spectrum analyzer.

5. Understand the significance of electronics and communication engineering and its applications in modern technology.

II Sem

Subject: DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS
Course code:2220002

Course Outcomes.

1. Utilize the methods of differential equations for solving Newton's law of cooling and Law of Natural growth and decay

2. Understand the solutions of linear differential equations with constant coefficients

3. Explain the concept of the Laplace transform and its significance in solving differential equations and evaluating integrals

4. Interpret the vector differential operators and their relationships for solving engineering problems

5. Apply the integral transformations to surface, volume and line of different geometrical models.

Subject: Applied Physics Course code: 2220008

Course Outcomes.

1. Illustrate the concepts of the dual nature of matter and the Schrödinger wave equation of a particle confined in a basic system

2. Classification of semiconductors and their roles in different types of optoelectronic devices utilized in a range of engineering applications

3. Gain knowledge on properties of dielectric and magnetic materials, suitable for engineering applications

4. Explain the key factors, fabrication methods, characterization techniques, and applications of nano materials

5. Relate the concepts of lasers and optical fibers, when used with normal light, in terms of their mechanisms and applications across various fields and scientific practices.

Subject: ENGINEERING WORK SHOP Course code:2220372

Course Outcomes.

1.Identifytheabilitytoworkfromdrawingsanddemonstrateproficiencywithhandtoolscommo ntocarpentry

2.DeterminetheabilitytoProduceFittingjobsasperspecifieddimensionsinadditiontodemonst ratingproficiencywithhandtoolscommontofitting

3.Createworksofmetalartusingfireandfurnacetoconvertgivenshapeintouseableelementsusi ngbasicblacksmithtechniques

4. Develop various engineering and house hold articles such as tin boxes, cans, funnels, ducts etc., from a flat sheet of metal.

5. Compare various wiring diagrams using conduit system of wiring and prepare different types of wiring joints on the given circuit boards using appropriate electrical tools.

Subject: English for Skill Enhancement Course code:2220010

Course Outcomes.

1. Explain the importance of vocabulary and sentence structures.

2. Apply appropriate vocabulary and sentence structures in both oral and written communication.

3. Demonstrate their understanding of functional grammar rules.

4. Develop comprehension skills from the known and unknown passages.

5. Draft and organize paragraphs, letters, essays, abstracts, précis, and reports for various contexts.

Subject: Basics of Electronic Devices and Circuits Course code:2220401

Course Outcomes.

1. Analyze the characteristics and applications of semiconductor devices, including PN junction diodes, Zener diodes, and SCRs

2. Design and test rectifiers (half-wave and full-wave) with and without filters, and evaluate clippers and clampers for voltage shaping

3. Examine the input and output characteristics of BJTs and FETs in different configurations

4. Employ transistors as switches for on-off control of devices and design circuits like voltage level indicators using BJTs.

5. Implement and evaluate Zener diodes as voltage regulators and test diode-powered backup systems.

Subject:DATASTRUCTURESLABORATORY Course code: 2220572

Course Outcomes.

1. Identify appropriate searching technique for efficient retrieval of data stored location

2. Choose sorting technique to represent data in specified format to optimize data searching

3. Make use of stacks and queues representation, operations and their applications to organize specified data

4. Construct tree to perform different traversal techniques.

5. Select Appropriate graph traversal techniques to visit the vertices of a graph.

Subject: Applied Physics Laboratory Course code: 22200071

Course Outcomes.

1. Know the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment.

2. Know the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment

3. Gain the knowledge of applications of dielectric constant.

4. Understand the variation of magnetic field and behaviour of hysteresis curve.

5. Perform data analysis to extract meaningful insights and support decision-making.

Subject: English Language & Communications Laboratory Course code: 2220073

Course Outcomes.

1. Enhance fluency in English by expanding vocabulary through multimedia exercises

2. Interpret spoken English at normal conversational speed, demonstrating active listening skills.

3. Adapt responses to various socio-cultural and professional contexts, showcasing situational awareness

4. Compose clear and coherent written communication that effectively conveys ideas.

5. Prepare for placement opportunities by practicing interview techniques and professional interactions.

Subject: IT Workshop Laboratory Course code: 22220575

Course Outcomes.

1. Demonstrate the ability to disassemble and reassemble a personal computer, ensuring proper setup and configuration for effective operation.

2. Access the internet and browse it to obtain the required information

3. Make use of word processing software to prepare, format, and finalize professional-quality documents.

4. Utilize presentation tools to prepare visually appealing and well-organized slide decks for effective communication.

5. Apply spreadsheet tools and functions to conduct calculations, data analysis, and create organized reports for real time applications.

Subject: Environmental Science Course code:2220021

Course Outcomes.

1. Illustrate the role of ecosystems in sustaining life on Earth, their contribution to environmental stability.

2. Summarize the role of environmental regulations in achieving sustainable development goals (SDGs)**.**

3. Organize the key characteristics of renewable and non-renewable resources and their contribution in functioning of ecosystems.

4. Apply environmental science concepts to real-world situations, including the design of sustainable urban environments, waste management systems, and renewable energy solutions.
5. Develop the ability to critically evaluate scientific literature, data, and environmental arguments to make informed decisions regarding environmental policies and practices

III Sem

Subject: Database Management Systems **Course code: 2230504**

Course Outcomes.

1. Outline the importance of database system, RDBMS and its functionalities for voluminous data storage and management
2. Model the real world database systems using Entity Relationship Diagrams from the requirement specification
3. Construct queries in Relational Algebra, Relational Calculus and SQL to retrieve desired information
4. Identify appropriate normalization technique using dependencies for controlling the redundancy of database
5. Demonstrate ACID properties of Transaction processing, concurrency control protocols and recovery to preserve the database in a consistent state.

Subject: Business Economics and Financial Analysis **Course code:2230016**

Course Outcomes.

1. Understand the basic concepts of economics and business economic inter-relationship
2. Apply the measurement techniques of Demand and Supply, their forecasting methods and concepts of elasticity
3. Analyze and demonstrate on production functions, production and cost analysis, market structure (like perfect competition, monopoly, monopolistic competition, oligopoly, etc.), know the price and quantity and their determination in each model
4. Analyze and apply accounting concepts to real-world business and project scenarios, interpreting financial data to effectively address and solve practical challenges in business operations.
5. Develop the ability to use a basic accounting system along with the application of ratios to create (record, classify, and summarize) the data needed to know the financial position of the organization.

Subject: Software Engineering **Course code:2230506**

Course Outcomes.

1. Illustrate process models, approaches and techniques for managing a software development process.
2. Summarize the importance of Project planning activities that accurately help in selection and initiation of individual projects and portfolios of Projects in the Enterprise.
3. Develop the approaches for implementation, verification and validation including static analysis and reviews.
4. Demonstrate the concept of risk management through risk identification, risk measurement and mitigation.

5. Make use of earned value analysis and project metric for scheduling and improving the quality of software.

Subject: Digital Logic Design **Course code:2230505**

Course Outcomes.

1. Understand the different forms of number representations and binary codes in digital logic circuits.

2. Make use of Boolean postulates, theorems and k-map for obtaining minimized Boolean expressions.

3. Implement the combinational logic circuits using the logic gates.

4. Utilize the functionality and characteristics of flip-flops and latches for designing sequential circuits.

5. Extend the knowledge of memories and programmable logic devices for understanding the architectural blocks of FPGA.

Subject: OOPS Through JAVA **Course code: 2230576**

Course Outcomes.

1. Understand the concepts of operators, precedence of operators, associativity while evaluating expressions in program statements.

2. Make use of the concept of classes and objects with access control and polymorphism techniques to represent real world entities.

3. Experiment with all threading and thread synchronization problems in soft real time systems.

4. Make use of inheritance, interfaces, packages and files to implement reusability in real time environment

5. Construct GUI based applications along with Exception handling using AWT, Swing and Applets with JDBC connectivity

Subject: Database Management Systems Laboratory **Course code: 2230574**

Course Outcomes.

1. Analyze database creation and manipulation concepts with the help of SQL queries

2. Make use of inbuilt functions of SQL queries to perform data aggregations, subqueries, embedded queries and views

3. Apply key constraints on database for maintaining integrity and quality of data.

4. Demonstrate the process of database normalization by effectively applying referential integrity constraints, ensuring data consistency and eliminating redundancy in relational database design.

5. Implement PL/SQL programs on procedures, cursors and triggers for enhancing the features of database system to handle exceptions.

Subject: Skill Development Course (Data Visualization/PowerBI) Course code: 2230583

Course Outcomes.

1. Acquire the skills to efficiently import data from various sources into Power BI, leveraging tools like Power Query to clean, transform, and load data.

2. Enhance their ability to build interactive reports and dashboards that offer insightful analyses based on user interactions and data context.
3. Develop Programs and understand how to map Visual Layouts and Graphical Properties
4. Design and implement interactive dashboards in Power BI that seamlessly integrate multiple visualizations.
5. Make use of graphical user interfaces to create Frames for providing solutions to real world problems.

Subject: OOPS Through Java Laboratory Course code:2230576
Course Outcomes.
1. Understand the concepts of operators, precedence of operators, associativity while evaluating expressions in program statements.
2. Make use of the concept of classes and objects with access control and polymorphism techniques to represent real world entities.
3. Perform file creation, deletion, renaming operations and checking file properties (size, time, etc) in given program
4. Identify the difference between single threaded and multi-threaded programs.
5. Develop event driven applications by implementing event-listeners like ActionListener, MouseListener and KeyListener.

Subject: Gender Sensitization Course code:2230022
Course Outcomes.
1. Gain insights into the history and evolution of gender studies and its impact on society
2. Identify forms of gender inequality and discrimination in various societal structures, including workplace, education, media, and law
3. Analyze the intersectionality of gender with other factors such as race, class, caste, sexual orientation, and disability
4. Apply gender-sensitive approaches to real-world scenarios, including group discussions, workshops, and projects.
5. Discuss the role of legal frameworks in combating gender-based violence and discrimination.

IV Sem

Subject: Discrete Mathematics Course code:2240507
Course Outcomes.
1. Demonstrate operations on discrete mathematical structures like sets, functions, lattices for representing the relations among them.
2. Illustrate rings, integral domains, and field structures with binary operations defined on them.
3. Apply addition rule and substitution rule for solving the problems of combinatorics.
4. Develop solutions for recurrence relations and generating functions to obtain terms of equation.

5. Identify appropriate algorithms of graphs and trees for finding shortest path.

Subject: Computer Oriented Statistical Methods Course code:2240004

Course Outcomes.

1. Write programs in C to solve problems using DS and choose appropriate DS to specific application.

2. Apply the concepts of probability and distributions to some case studies

3. Analyze sampling theory and testing of hypothesis and making inferences and implement and correlate the material of one unit to the material in other units.

4. Understand probability distributions of single and multiple random variables.

5. Understand the basics of instructions sets and their impact on processor design.

Subject: Computer Organization and Architecture Course code:22X0508

Course Outcomes.

1. Understand the basics of instructions sets and their impact on processor design.

2. Demonstrate an understanding of the design of the functional units of a digital computer system.

3. Evaluate cost performance and design trade-offs in designing and construct a computer processor including memory.

4. Design a pipeline for consistent execution of instructions with minimum hazards.

5. Recognize and manipulate representations of numbers stored in digital computers

Subject: Operating Systems Course code:2240509

Course Outcomes.

1. Explain different architectures used in design of modern operating systems

2. Solve problems related to process scheduling, synchronization and deadlock handling in uni and multi-processing systems.

3. Choose memory allocation algorithms and page replacement algorithms for effective utilization of resources.

4. Make use of different file allocation and disk scheduling algorithms applied for efficient utilization of storage.

5. Outline mechanisms used in protection of resources in real time environment.

Subject: Python Programming Course code: 2240503

Course Outcomes.

1. Demonstrate the basic concepts of python programming with the help of data types, operators and expressions, console input/output

2. Make use of control statements for altering the sequential execution of programs in solving problems.

3. Apply operations on built-in container data types (list, tuple, set, dictionary) and strings

4. Illustrate operations and applications on strings with the help of built in functions.

5. Identify object-oriented programming constructs for developing large, modular and reusable real-time programs.

Subject: Python Programming Lab Course code:2240573

Course Outcomes.

1. Make use of control statements for altering the sequential execution of programs in solving problems.

2. Demonstrate operations on built-in container data types (list, tuple, set, dictionary) and strings.

3. Develop the ability to efficiently perform operations and applications on strings with the help of built in functions.

4. Solve the problems by using modular programming concepts through functions

5. Identify object-oriented programming constructs for developing large, modular and reusable real-time programs.

Subject: Operating Systems Lab Course code:2240577

Course Outcomes.

1. Make use of pre-emptive and non-pre-emptive scheduling strategies for calculating system performance

2. Choose page replacement algorithm for effective utilization of main memory.

3. Utilize file allocation strategy for efficient mass storage devices management**.**

4. Develop deadlock handling procedures for improving process management.

5. Develop deadlock handling procedures for improving process management.

Subject: Skill Development Course (Node JS/REACT JS/DJANGO)

Course code:

Course Outcomes.

1. Build a custom website with HTML, CSS, and Bootstrap and little JavaScript.

2. Demonstrate Advanced features of JavaScript and learn about JDBC

3. Develop Server – side implementation using Java technologies like

4. Analyze the server – side implementation using Node JS.

5. Design a Single Page Application using React.

Subject: Field Based Project Course code: 2240591

Course Outcomes.

1. Identify the requirements of the project.

2. Plan the schedule and budget required for project development

3. Utilize the application tool with the learned technologies.

4. Develop the real-time applications and analysis the performance of the application

5. Prepare the document for the project developed.

Subject: Constitution of India **Course code:2240023**

Course Outcomes.

1. Understand the Meaning and Importance of Constitution, Fundamental rights and Duties, Union Government, State and Local Governments, other Statutory Bodies

2. Create Awareness about social Responsibilities

3. Apply the Functioning of Union, State and Local Governments in Indian Federal System

4. Analyze Election commission and Amendment Procedure for various statuary bodies

5. Comprehend the Judiciary's role in Interpreting the constitution and Ensuring Fundamental Rights Through Judicial Review

V Sem

Subject: Design and Analysis of Algorithms **Course code:2250511**

Course Outcomes.

1. Find the (worst case, randomized, amortized) running time and space complexity of given algorithms using techniques such as recurrences and properties of probability.

2. Apply divide and conquer algorithms for solving sorting, searching and matrix multiplication.

3. Apply divide and conquer algorithms for solving sorting, searching and matrix multiplication.

4. Identify suitable problem-solving techniques for a given problem and finding optimized solutions using Greedy and Dynamic Programming techniques

5. Utilize backtracking and branch and bound techniques to deal with traceable and in-traceable problems.

Subject: Computer Networks **Course code: 2250512**

Course Outcomes.

1. Understanding of the basic concepts of data communications including the key aspects of networking and their interrelationship, packet switching, circuit switching and cell switching as internal and external operations, physical structures, types, models, and internetworking.

2. Illustratively explain the concept of Hamming distance, and the significance of the minimum Hamming distance and its relationship to errors as well as detection and correction of errors in block codes.

3. Evaluate the performance of a single link, logical process-to-process (end-to-end) channel, and a network as a whole (latency, bandwidth, and throughput).

4. Distinguish between the different types of bit errors and can explain the concept of bit redundancy and how it is generally achieved in the facilitation of error detection and the main methods of error correction

5. Explain and demonstrate the mechanics associated with IP addressing, device interface, association between physical and logical addressing, subletting and super netting.

Subject: Artificial Intelligence **Course code: 2250516**

Course Outcomes.

1. Frame an efficient problem space for a problem expressed in natural language
2. Finalize a search algorithm for a problem and estimate its time and space complexities.
3. Possess the skill for representing knowledge using the appropriate technique for a given problem.
4 Develop Possess the skill for representing knowledge using the appropriate technique for a given problem. Logical Reasoning Systems
5. Apply AI techniques to solve problems of game playing, and machine learning.

Subject: Air and Noise Pollution Control **Course code:**
Course Outcomes.
1. have a firm foundation and knowledge of mathematics, science and engineering principles.
2. define fundamental concepts of Air Pollution
3. design and conduct experiments
4. Design a component system
5. think logically, critically and creatively

Subject: Internet of Things **Course code: 22x0544**
Course Outcomes.
1. Understand the characteristics, protocols and communication models required for logical design of IoT.
2. Realize the hardware platforms for implementing and interfacing the IoT based board with different peripheral devices and serial communication devices.
3. Develop stacks for IoT and M2M networks and configurations.
4. Integrate devices and develop an application that can communicate through IoT Cloud.
5. Learn how to integrate IoT devices with cloud services and explore edge computing to optimize performance and reduce latency in IoT applications.

Subject: Computer Networks Lab **Course code:2250578**
Course Outcomes.
1. Demonstrate the ability to set up and configure basic network topologies using computers, media, and devices.
2. Experiment key aspects of data communication, such as packet switching, circuit switching, and cell switching.

3. Implement Hamming distance by constructing and verifying error detection and correction methods in block codes.
4. Evaluate network performance parameters such as latency, bandwidth, and throughput for single links and end-to-end channels using simulation tools.
5. Utilize bit errors, error detection and correction methods, and analyse their performance in terms of redundancy and efficiency.

Subject: Design and Analysis of Algorithms Lab **Course code:2250579**

Course Outcomes.

1. Understand the concepts of operators, precedence of operators, associativity while evaluating expressions in program statements

2. Make use of classes and objects with access control and polymorphism techniques to represent real world entities

3. Utilize Greedy Technique or principle of Optimality for finding solutions to optimization problems

4. Compare the efficiencies of traversal problems using different Tree and Graph traversal algorithms.

5. Utilize Backtracking method for solving Puzzles involving building solutions incrementally

Subject: Skill Development Course (UI-FLUTTER) Course code:2250585

Course Outcomes.

1. Gain a solid foundation in Flutter framework and Dart programming language, focusing on the core concepts of UI design and app development.

2. Develop the skills to create responsive and adaptive user interfaces that work seamlessly across various screen sizes and device types using Flutter.

3. Learn to use and customize a wide variety of Flutter widgets, such as containers, rows, columns, stacks, and lists, to build interactive and dynamic UIs.

4. Design a form with various input fields, along with validation and error handling.

5. Analyze hands-on experience in implementing animations, transitions, and gestures to enhance the interactivity and visual appeal of Flutter apps.

Subject: Internship Course code:2250592

Course Outcomes.

1. Apply theoretical knowledge to real-world professional problems and practices in the chosen domain.

2. Demonstrate technical and professional skills required for workplace success, including teamwork, communication, and problem-solving.

3. Develop a better understanding of organizational structure, work culture, ethics, and project management practices.

4. Analyze and evaluate professional experiences to enhance career readiness and identify areas for personal and technical growth.

5. Prepare comprehensive reports and presentations to communicate internship outcomes effectively to academic and professional audiences.

Subject: INTELLECTUAL PROPERTY RIGHTS Course code:2250024

Course Outcomes.

1. Understands the fundamentals of Intellectual Property

2. Analyze the ethical implication of Intellectual Property rights.

3. Apply Intellectual Property Laws in National and International Contexts

4. Demonstrate Intellectual Property Rights impact on Global Trade and Economic Development

5. Gain a comprehensive understanding of the importance and impact of Intellectual Property (IP) in the creative industries, exploring its role in protecting innovation, fostering creativity, and driving business value.

VI Sem

Subject: Machine Learning **Course code:2260514**

Course Outcomes.

1. Understand supervised and unsupervised learning, concept learning, inductive bias, and decision tree learning.
2. Apply artificial neural networks and the backpropagation algorithm to solve error comparison methods.
3. Make Use Bayes theorem, Naïve Bayes Classifier, and Bayesian Belief Networks, to compute learning theory such as PAC learning and the KNN algorithm.
4. Explore Genetic Algorithms, Sequential Covering Algorithms, and Reinforcement Learning, Q-learning and rule-based learning.
5. Apply analytical learning to augment the hypothesis and search operators.

Subject: Formal Language of Automata Theory **Course code: 2260515**

Course Outcomes.

1. Make use of deterministic finite automata and non-deterministic finite automata for modelling lexical analysis and text editors.
2. Extend regular expressions and regular grammars for parsing and designing programming languages.
3. Illustrate the pumping lemma on regular and context free languages for perform negative test.
4. Demonstrate context free grammars, normal forms for generating patterns of strings and minimize the ambiguity in parsing the given strings.
5. Apply Turing machines and Linear bounded automata for recognizing the languages, complex problems.

Subject: Web Technologies **Course code:2260524**

Course Outcomes.

1. Understand the basic concepts of server side scripting language like PHP programming and its database connectivity in real time applications.
2. Develop effective and interactive web pages using elements and selectors in style sheets and dynamic HTML.
3. Learn how to create and deploy dynamic, server-side applications by implementing Java Servlets to handle client requests and responses.

4. Demonstrate a server-side web application using servlets and Java Server Pages (JSP) for request-response programming paradigm.
5. Make use of functions in JavaScript and PHP for implementing data validations in web applications.

Subject: DATA SCIENCE **Course code: 22X0546**

Course Outcomes.

1. Understand basic terms what Statistical Inference means.
2. Identify probability distributions commonly used as foundations for statistical modelling. Fit a model to data
3. Describe the data using various statistical measures.
4. Utilize R elements for data handling.
5. Perform data reduction and apply visualization techniques.

Subject: FUNDAMENTALSOF EMBEDDED SYSTEMS **Course code:**

Course Outcomes.

1. Understand the key concepts and components of Embedded Systems.
2. Design Embedded Systems by integrating various components effectively.
3. Apply Software Development Methodologies for Embedded Systems.
4. Demonstrate Real Time Operating Systems concepts in Embedded Systems Design.
5. Evaluate and implement Communication Methods in embedded Systems.

Subject: ADVANCED COMMUNICATION SKILLS LAB **Course code:2260074**

Course Outcomes.

1. Enhance fluence in English by expanding vocabulary through multimedia exercises.
2. Interpret spoken English at normal conversational speed, demonstrating active listening skills.
3. Adapt responses to various socio -cultural and professional contexts, showcasing situational awareness.
4. Compose Clear and coherent written communication that effectively conveys ideas.
5. Prepare for placement opportunities by practicing interview techniques and professional interactions.

Subject: MACHINE LEARNING LAB **Course code: 2260580**

Course Outcomes.

1. Extract and preprocess data from databases for machine learning applications using Python.
2. Design and apply k-nearest neighbours (KNN) and k-means clustering algorithms for classification and clustering tasks.
3. Analyze real-world datasets to compute probabilities and evaluate relationships between variables for conditional and unconditional probabilities.
4. Apply machine learning techniques like linear regression, Naïve Bayes classifier, and genetic algorithms for prediction, classification, and optimization tasks.
5. Build and evaluate a finite-word classification system using neural networks with the backpropagation algorithm.

Subject: WEB TECHNOLOGIES **Course code: 2260587**

Course Outcomes.

1. Design static web pages using HTML and CSS. .
2. Develop effective and interactive web pages using elements and selectors in style sheets and dynamic HTML.

3. Make use of functions in JavaScript and JavaScript Control statements for implementing data validations in web applications.
4. Develop dynamic web site using server-side PHP programming
5. Construct website by using front end and back-end programming.

Subject: INDUSTRY ORIENTED MINI PROJECT Course code: 2260593

Course Outcomes.

1. Identify and implement an investigation or developmental project with given general objectives and guidelines
2. Develop an in-depth skill to use some laboratory modern tools and techniques
3. Analyze data produce useful information and draw conclusions
4. Communicate results concepts, analyses and ideas.
5. Conduct an extended independent investigation that results in the production of a research thesis

Subject: ENVIRONMENTAL SCIENCE Course code: 2260025

Course Outcomes.

1. Illustrate the role of ecosystems in sustaining life on Earth, their contribution to environmental stability.
2. Summarize the role of environmental regulations in achieving sustainable development goals (SDGs).
3. Organize the key characteristics of renewable and non-renewable resources and their contribution in functioning of ecosystems
4. Interpret how environmental regulations help decision-makers consider environmental factors in developing activities.
5. Identify the role of aesthetic, social and ethical values in environmental design.

Subject: FUNDAMENTALS OF MANAGEMENT Course code: 2270017

Course Outcomes.

1. Illustrate the role of ecosystems in sustaining life on Earth, their contribution to environmental stability.
2. Summarize the role of environmental regulations in achieving sustainable development goals (SDGs).
3. Organize the key characteristics of renewable and non-renewable resources and their contribution in functioning of ecosystems
4. Interpret how environmental regulations help decision-makers consider environmental factors in developing activities.
5. Identify the role of aesthetic, social and ethical values in environmental design.

Subject: CRYPTOGRAPHY AND NETWORK SECURITY Course code: 2270519

Course Outcomes.

1. Outline model for network security and cryptographic algorithms to prevent attacks on computer and computer security.

2. Demonstrate symmetric and asymmetric key ciphers for messaging end to end encryption used in different types of cryptographic algorithms
3. Choose appropriate architecture and protocols used in email and IP security to protect against attackers and intruders
4. Select firewalls to provide web security as case study in cryptography and network security

5. Utilize cryptographic and security algorithms to enhance defense against cyber-attacks and to improve organization working culture.

Subject: COMPILER DESIGN **Course code: 2270517**

Course Outcomes.

1. Summarize phases of a compiler in the construction of language processors.
2. Make use of finite automata for designing a lexical analyzer for a specific programming language constructs.
3. Choose top down, bottom up parsing methods for developing a parser with representation of a parse table or tree.
4. Relate symbol table, type checking and storage allocation strategies used in run-time environment.
5. Apply code optimization techniques on intermediate code form for generating target code.

Subject: FULL STACK DEVELOPMENT **Course code: 22X0549**

Course Outcomes.

1. Develop responsive and interactive web pages using HTML, CSS, and JavaScript to implement user-friendly interfaces.
2. Design dynamic web applications using frontend frameworks like React, Angular, or Vue.js, incorporating modern design patterns and best practices.
3. Analyze and implement RESTful APIs using backend technologies such as Node.js, Express, Django, or Flask to handle requests and responses efficiently.
4. Combine databases (SQL and NoSQL) with web applications to store, retrieve, and manipulate data effectively.
5. Test for correctness of web services and client-side interactions using relevant tools, ensuring reliability, performance.

Subject: Deep Learning Course **code: 22X0551**

Course Outcomes.

1. Understand the basic concepts of shallow and deep learning paradigms.

2. Compare different deep network architectures, including their strengths, weaknesses, and suitable application areas.
3. Identify optimization methods such as gradient descent, momentum, and adaptive learning rates.
4. Experiment tools TensorFlow, PyTorch or Keras for implementing deep learning models.
5. Assess the limitations and future trends of deep learning technologies.

HOD **Principal**