

# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

# **REGULATIONS: MLRS R20**

I Sem

#### Subject: Engineering Mathematics-I Course code: 2010001 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 eigenvalues and eigenvectors of a matrix and its role in diagonalization

3. Relate Beta and Gamma functions to standard integrals for solving 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 of polar, spherical, and cylindrical coordinates

### Subject: Engineering Chemistry Course code: 2010008 Course Outcomes.

**1.** Analyze microscopic chemistry in terms of atomic, molecular orbitals and intermolecular forces

2. Understand the basics on softness of water by ion exchange process.

3. Remember the types of factors affecting the corrosion

**4.** Recall the synthesis of aspirin, Paracetamol

**5.** Understand the principles of spectroscopy and its selection rules and explain the concepts of nuclear magnetic resonance spectroscopy.

#### Subject: Programming for Problem Solving Course code: 2010501 Course Outcomes.

**1.** Illustrate problem solving steps in terms of algorithms, pseudocode and flowcharts for Mathematical and Engineering problems

2. Construct programs involving decision structures, loops, arrays and strings

**3**. Apply fundamental programming concepts in C by manipulating strings, utilizing structures and unions for complex data representation, and employing pointers for efficient memory access and data manipulation, including self-referential structures and enumerated data types.

**4.**Design and implement efficient C programs using structured programming principles, including function declarations and parameter passing techniques, recursion, and dynamic memory allocation for flexible and optimized memory management.

5. Use file Input and output operations in implementation of real time applications

### Subject: Engineering Workshop Course code: 2010372

### **Course Outcomes.**

**1.** Identify the ability to work from drawings and blueprints and demonstrate proficiency with hand tools common to carpentry.

2. Determine the ability to Produce Fitting jobs as per specified dimensions

in addition to demonstrating proficiency with hand tools common to fitting.

**3.** Create works of metal art using fire and furnace to convert given shape into useable elements using basic blacksmith techniques.

**4.** Organize the molding techniques for producing casting of different and complex shapes using various patterns.

**5.** Develop various engineering and household articles such as tin boxes, cans, funnels, ducts etc., from a flat sheet of metal.

### Subject: Communicative English Course Code: 2010009

### **Course Outcomes.**

- 1. Use English Language effectively in spoken and written forms.
- 2. Comprehend the given texts and respond appropriately.
- 3. Communicate confidently in various contexts in their profession.
- 4. Acquire basic proficiency in English including LSRW skills.
- 5. Recognize and apply basic grammar rules and incorporate sentence variety to enhance writing.

#### Subject: Engineering Chemistry Lab Course Code: 2010073

- 1. Determination of parameters like hardness of water by complexometric method and determine the given Fe amount by volumetric analysis. Understand various procedures for performing the experiments
- 2. Able to perform methods such as conductometry, potentiometry in order to find out the concentrations or equivalence points of acids and bases. Explain the different measuring devices and meters to record the data.
- 3. Determination of rate constant of acid-catalysed hydrolysis of methyl acetate, Synthesis of aspirin and paracetamol.

- 4. Estimation 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. Thin-layer chromatography: calculation of Rf values for ortho and para-nitrophenols.

### Subject: Communicative English Lab Course Code: 2010074 Course Outcomes.

- 1. Recognize basic features and sounds of the English language through audiovisual materials Apply strategies to neutralize accents, ensuring intelligibility in communication.
- 2. Explain how accent neutralization improves clarity and intelligibility in communication. Demonstrate effective communication skills in diverse public and interpersonal settings.
- **3.** Describe the role of group activities in developing speaking skills, clarity, and confidence to enhance employability.
- 4. Apply effective communication skills in a variety of public and interpersonal settings.
- 5. Apply spoken English skills to communicate fluently and reduce mother tongue influence with confidence Apply effective communication skills in a variety of public and interpersonal settings.

### Subject: Programming for Problem solving Lab Course Code: 2010571 Course Outcomes.

- 1. Demonstrate problem solving steps in terms of algorithms, pseudocode and flowcharts for Mathematical and Engineering problems.
- 2. Apply the concept of pointers, arrays and strings for solving real-time problems.
- 3. Analyze the complexity of problems, modularize the problems into small modules and then convert them into programs.
- 4. Implement the programs with concept of file handling functions and pointer with real time applications of C.
- 5. Explore the concepts of searching and sorting methods with real time applications using C.

#### Subject: Environmental Science Course Code: 2010021 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.

#### II Sem

### Subject: Engineering Mathematics– II Course code: 2020002

### **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. Classify the sequences and series based on their convergence properties.
- 4. Interpret the vector differential operators and their relationships for solving engineering problems.
- **5.** Apply the integral transformations to the surface, volume and line of different geometrical models

### Subject: Applied Physics Course code: 2020006 Course Outcomes.

- 1. Illustrate the concepts of the dual nature of matter and the Schrödinger wave equation to a particle confined in a basic system
- 2. Explain the classification of semiconductors and its uses in diodes
- 3. Examine the I-V characteristics of various optoelectronics devices of LED, Solar cell and photodiodes.
- 4. Relate the concepts of lasers and optical fibres, when used with normal light, in terms of their mechanisms and applications across various fields and scientific practices.
- 5. Gain knowledge on properties of dielectric and magnetic materials, suitable for engineering applications.

#### Subject: Data Structures Course code: 2020502

- 1. Interpret the complexity of algorithm using the asymptotic notations.
- 2. Construct programs on performing operations on linear and nonlinear data structures for organization of a data.
- 3. Select appropriate searching and sorting technique for a given problem.
- 4. Describe hashing techniques and collision resolution methods accessing data with respect to performance.

**5.** Compare various types of data structures in terms of implementation, operations and performance

#### Subject: Engineering Drawing Practice Course code: 2020009 Course Outcomes.

- 1. Summarize the Bureau of Indian Standards and conventions relevant to Engineering Drawing.
- 2. Illustrate Engineering curves and scales for Engineering applications
- 3. Construct the lateral surfaces of simple solids for orthographic and Isometric projections of engineering components
- 4. Interpret different views, including elevation and plan, for lines, plane figures and solid objects
- 5. Utilize drafting techniques to draw 2D plane figures in Auto-CAD.

### Subject: Applied Physics Lab

### Course code: 2020071

### **Course Outcomes**

- 1. Understand the concepts of the error and its analysis
- 2. Explain the different measuring devices and meters to record the data with precision.
- 3. Apply the experimental skills to design new experiments in engineering.
- 4. Analyze the theoretical knowledge and correlate with the experiment.
- 5. Evaluate the various parameters accurately.

# Subject: Data Structures Lab

# Course code: 2020572

### **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.

### III Sem Subject: DATABASE MANAGEMENT SYSTEMS Course code: 2030503

- 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 Relational Algebra and Relational Calculus from the requirement specification

- 3. Construct SQL queries for retrieving desired information from Databases
- 4. Apply ACID properties in Transaction processing, concurrency control protocols for recovering databases into consistent state.
- 5. Demonstrate the ability to design and utilize appropriate data storage structures such as hash based, tree-based indexing

### Subject: Business Economics and Financial Analysis

### Course code: 2030010

### **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. Understand concepts and conventions of accounting, analyze and demonstrate preparation of accounting statements, interpret the solutions for real time problems in business and projects
- **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: Probability And Statistics Course code: 2030004 Course Outcomes.

- 1. List the additive rules of probability, conditional probability, and Bayes' theorem.
- 2. Explain the process of estimation, including estimating the mean, variance, proportion, and differences between means and proportions for different sample scenarios
- 3. Apply the central limit theorem to determine the sampling distribution of the sample mean and use it for hypothesis testing and confidence interval estimation
- 4. Identify the conditions and assumptions underlying large sample tests for single proportion, difference of proportions, single mean, and difference of means.
- 5. Understand the difference between correlation and regression, and explain the concept of rank correlation....

### Subject: Digital Logic Design Course code: 2030504

- 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: Python Programming Course code: 2030505 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. Demonstrate 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: Database Management Systems Lab Course code: 2030573 Course Outcomes.

- 1. Demonstrate 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 normalization by using referential key constraint.
- **5.** Implement PL/SQL programs on procedures, cursors and triggers for enhancing the features of database system to handle exceptions

#### Subject: IT Workshop Lab Course code: 2030574 Course Outcomes.

- 1. Make use of network devices with classification of IP addresses and packet trackers for better understanding
- 2. Demonstrate Formatting Techniques of latex to prepare Technical and Non-Technical reports.
- 3. Design documents consist of mathematical symbols, tables with various styles for developing graphical user interface applications

- 4. Determine the ability to Produce Fitting jobs as per specified dimensions in addition to demonstrating proficiency with hand tools common in fitting.
- 5. Create a desired shape with given metal plates by using welding processes and to convert given shape into useable elements using power tools.

### Subject: Python Programming Lab

### Course code: 2030575

### **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. Make use of 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: Gender Sensitization

### Course code: 2030022

### **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: 2040506 Course Outcomes.

- 1. Define predicate logic with quantifiers universal and existential statements and the distinction between predicates and propositions
- 2. Demonstrate operations on discrete mathematical structures such as sets, functions, lattices for representing the relations among 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: Basic Electrical Engineering

### Course code: 2040201 Course Outcomes.

- 1. Analyze Electrical circuits to compute and measure the parameters of Electrical Energy
- 2. Comprehend the working principles of Electrical DC Machines
- 3. Identify and test various electrical switchgear, single phase transformers and assess the ratings needed in given application
- 4. Comprehend the working principles of electrical AC machines.
- 5. Ensure Safety and Practical Application

## Subject: Computer Organization & Microprocessors Course code: 2040507

### **Course Outcomes.**

- 1. Demonstrate knowledge of memory systems, including cache, main memory, and virtual memory, and evaluate their performance in computer systems.
- 2. Analyze input/output devices and their interfacing with the processor, including interrupt-driven I/O and DMA.
- 3. Summarize the performance of processors, role of pipelining, parallelism, and instruction-level enhancements in improving CPU efficiency.
- 4. Design basic microprocessor-based systems using concepts of interfacing, timers, counters, and peripheral devices.
- **5.** Recognize the significance of advancements in processor design, including multi-core architectures, GPUs, and embedded processors

#### Subject: Design and Analysis of Algorithms Course code: 2040508 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. Make Use of appropriate tree traversal techniques for finding shortest path.
- 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 intraceable problems.

### Subject: JAVA programming Course code: 2040509 Course Outcomes.

- 1. Demonstrate object-oriented programming concepts that helps to organize complex problems solving
- 2. Utilize the abstraction, encapsulation and polymorphism Techniques to solve different complex problems

- 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: Basic Electrical Engineering Lab Course code: 2040271 Course Outcomes.

- 1. Get an exposure to basic electrical laws
- 2. Understand the response of different types of electrical circuits to different excitations
- 3. Understand the measurement, calculation and relation between the basic electrical parameters
- 4. Understand the basic characteristics of transformers and electrical machines
- **5.** Ensure Safety and Troubleshooting

#### Subject: Design and Analysis of Algorithms through Java Lab Course code: 2040576 Course Outcomes.

- 1. Make use of operators, precedence of operators, associativity while evaluating expressions in program statements
- 2. Make use of the concept of class 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: CO&MP Lab using MASAM Course code: 2040577

- 1. Demonstrate programs to manipulate data in memory using various addressing modes
- 2. Demonstrate the use of general-purpose and special-purpose registers in assembly language programs.
- 3. Design assembly programs that use subroutines, stack operations (push, pop), and parameter passing mechanisms.

- 4. Design small applications or utilities using MASM, showcasing real-world problemsolving capabilities.
- **5.** Develop assembly language programs to improve performance and minimize resource usage

#### Subject: Constitution of India Course code: 2040023

### **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: OPERATING SYSTEMS Course code: 2050510

### **Course Outcomes.**

- 1. Explain the different architectures used in designing the various operating systems.
- 2. Solve the problems of process scheduling, inter-process communication and multithreading models.
- 3. Apply deadlock avoidance algorithm and synchronization techniques such as producerconsumer to solve problems in real time applications.
- 4. Choose the memory allocation algorithms and page replacement algorithms for effective utilization of resources.
- **5.** Make use of different file allocation and file accessing methods for efficient utilization of storage

#### Subject: COMPUTER NETWORKS Course code: 2050511 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, subnetting and super netting

## Subject: FORMALLANGUAGESANDAUTOMATATHEORY Course code: 2050512

### **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: SOFTWARE ENGINEERING Course code: 2050513 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 using UML diagrams
- 4. Make use of earned value analysis and project metric for scheduling and improving the quality of software.
- 5. Demonstrate the concept of risk management through risk identification, risk measurement and mitigation.

### Subject: INFORMATIONRETRIEVAL SYSTEMS Course code: 2050544

- 1. Demonstrate knowledge of indexing techniques, query processing, and optimization strategies used in IR systems.
- 2. Apply appropriate metrics to evaluate the effectiveness and efficiency of IR systems, including precision, recall, and F-measure.

- 3. Analyze text data for information retrieval tasks, including tokenization, stemming, lemmatization, and stop-word removal.
- 4. Develop algorithms for query processing, including query expansion, relevance feedback, and optimization to improve retrieval performance.
- 5. Make use of basic natural language processing (NLP) techniques into IR applications.

### Subject: COMPUTER NETWORKS LAB Course code: 2050578 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 analyze their performance in terms of redundancy and efficiency.

#### Subject: OPERATING SYSTEMS LAB Course code: 2050579 Course Outcomes.

- 1. Apply pre-emptive and non-pre-emptive scheduling strategies for calculating system performance.
- 2. Implement and work with system calls such as file operations, process management, memory management and Inter-Process Communication (IPC).
- 3. Apply Deadlock handling Algorithms for improving process management
- 4. Demonstrate the usage of shared memory for efficient data transfer between various processes in real time applications.
- 5. Make use of message-passing systems for communication between processes

### Subject: SOFTWARE ENGINEERING LAB Course code: 2050580

### **Course Outcomes.**

1. Develop and interpret Data Flow Diagrams at different levels to represent the data flow and processes in the identified software system.

- 2. Make use of Class diagram relationships and packages to design a static structure of the proposed system.
- 3. Model system behaviour using Activity Diagrams to represent workflows and State Chart Diagrams to represent the state transitions of the system.
- 4. Apply object-oriented analysis to model and document software systems in diverse domains using standard UML notations and tools.
- 5. Identify use cases and model their interactions using Use Case Diagrams, including relationships like include and extend.

#### Subject: INTELLECTUAL PROPERTY RIGHTS Course code: 2020024 Course Outcomes

- 1. Understands the fundamentals of Intellectual Property
- 2. Understands the ethical implication of IP
- 3. Apply Intellectual Property Laws in National and International Contexts
- 4. Understands IP' impact on Global Trade and Economic Development
- 5. Understand the role of IP in creative Industries

### VI Sem

Subject: DATAMINING Course code: 2060514 Course Outcomes.

- 1. Select appropriate preprocessing techniques on real time data for usage of data mining algorithms
- 2. Apply Apriori and FP growth methods on transaction data for frequent pattern mining
- 3. Choose classification algorithm for building a classification or prediction model.
- 4. Infer complex data models with respect to multimedia, streams, spatial and web mining
- 5. Examine data mining algorithms for solving real world problems

### Subject: COMPILER DESIGN Course code: 2060515 Course Outcomes.

- 1. Summarize the phases of a compiler in the construction of language processors.
- 2. Choose top down, bottom-up parsing methods for developing a parser with representation of a parse table or tree.
- 3. Develop syntax-directed translation rules for translating programming languages in to intermediate forms.

- 4. Identify the components, memory management, stack and heap activation records of a runtime environment.
- 5. Select code optimization techniques on intermediate code form for generating target code.

### Subject: WEB TECHNOLOGIES

### Course code: 2060516

### **Course Outcomes.**

- 1. Make use of functions in PHP for implementing data validations in web applications
- 2. Develop effective and interactive web pages using elements and selectors in style sheets and dynamic HTML.
- 3. Demonstrate a server-side web application using servlets for request-response programming paradigm.
- 4. Apply JSP directives, declarations, expressions, and script lets effectively in web applications.
- 5. Illustrate the use of implicit objects (e.g., request, response, session, application) for web development.

# Subject: LINUX PROGRAMMING Course code: 2060545

### **Course Outcomes.**

- 1. Demonstrate Linux operating system architecture, file system hierarchy, and essential commands for system navigation and management.
- 2. Apply file operations and process management using Linux system calls in C/C++ programs.
- 3. Make use of Linux tools such as gcc, gdb, make, and version control systems (e.g., Git) for efficient development, debugging, and project management.
- 4. Explore advanced Linux features such as kernel modules, device drivers, and signal handling for custom system-level functionalities.
- 5. Demonstrate inter-process communication (IPC) techniques such as pipes, message queues, shared memory, and semaphores in Linux.

### Subject: MOBILECOMPUTING Course code: 2060546 Course Outcomes.

- 1. Inspect wireless networking technologies such as Wi-Fi, Bluetooth, Zigbee, and LTE, and evaluate their use in different scenarios.
- 2. Analyze mobile network architectures such as GSM, GPRS, and UMTS in providing seamless communication.

- 3. Demonstrate mobile IP, handoff techniques, and routing protocols to support mobility in networks.
- 4. Design mobile applications using frameworks and platforms of Android and iOS.
- **5.** Evaluate the performance of mobile computing systems using metrics like latency, throughput, and scalability under different conditions.

# Subject: CRYPTOGRAPHY&NETWORKSECURITY Course code: 2060547

# 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. Utilize cryptographic and security algorithms to enhance defence against cyberattacks and to improve organization working culture.
- 4. Choose appropriate architecture and protocols used in email and IP security to protect against attackers and intruders
- 5. Select firewalls to provide web security as case study in cryptography and network security.

### Subject: AIR AND NOISE POLLUTION CONTROL Course code: 2060101

### **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: DATA MINING LAB Course code: 2060581 Course Outcomes.

- 1. Evaluate the performance of data mining models using metrics such as accuracy, precision, recall, F1-score, and support-confidence metrics.
- 2. Make use of k-Means, Hierarchical Clustering, and DBSCAN clustering algorithms to identify patterns effectively.
- 3. Identify uncover relationships and frequent patterns in datasets with Apriori and FP-Growth Association rule mining algorithms

- 4. Evaluate classification algorithms such as Decision Trees, Naïve Bayes, and k-Nearest Neighbour (k-NN) on real-world datasets.
- 5. Experiment with Weka, Python tools and libraries to implement data mining tasks on real-world datasets.

# Subject: WEB TECHNOLOGIES LAB Course code: 2060582

### 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: AECS LAB

### Course code: 2060075

### **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: Professional Ethics Course code:2040025 Course Outcomes

- 1. Understand the importance of Professional Practice, law and Ethics in their personal lives and professional careers
- 2. Learn the Rights and Responsibilities as an employee, team member and global citizen
- 3. Develop Ethical Decision-making skills
- 4. Recognize the importance of professional codes of ethics
- 5. Exhibit personal and professional Integrity

### VII Sem

### Subject: Fundamentals of Management

### Course code: 2070011

### **Course Outcomes.**

- 1. Understand Management Principles Articulate Key Management Concepts and their historical development
- 2. Apply planning Techniques Develop strategic, tactical and operational plans to achieve organizational goals
- 3. Analyze Organizational Structures Evaluate different organizational designs and their effectiveness in various contents
- 4. Implement Control Mechanisms Utilize performance measurement tools to assess and improve organizational effectiveness, leadership skills
- 5. Enhance Decision-Making Abilities Employ analytical and creative problem-solving techniques in decision -making scenarios and controlling Budgetary and non-Budgetary.

### Subject: Full Stack Development

### Course code: 2070517

### **Course Outcomes.**

- 1. Understand the architecture of full-stack development, including frontend, backend, and database layers, and their integration in web applications.
- 2. Demonstrate frontend technologies, including HTML, CSS, and JavaScript, for creating responsive and interactive user interfaces.
- 3. Understand backend development concepts, including server-side programming, RESTful API design, and session management using technologies like Node.js, Django, or Flask.
- 4. Evaluate the performance, scalability, and usability of full-stack applications, applying optimization techniques for improved user experience.
- 5. Make use of databases, both relational (SQL) and non-relational (NoSQL), to design, query, and manage data for web applications.

### Subject: Machine Learning Course code: 2070518 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 of 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: Wireless Sensor Networks Course code: 2070549 Course Outcomes.

- 1. Understand the fundamentals of wireless sensor networks and differentiate them from traditional communication networks.
- 2. Design sensor node architecture for hardware and software components.
- 3. Evaluate communication protocols and algorithms suitable for resource-constrained environments in Wireless Sensor Networks.
- 4. Implement energy-efficient strategies to optimize WSN performance under limited power availability.
- **5.** Develop applications using WSN for real-world scenarios, addressing societal and industrial needs

### Subject: Distributed System

### Course code: 2070553

### **Course Outcomes.**

- 1. Identify the challenges in the design, development and maintenance of run-time environments for distributed systems
- 2. Evaluate various time synchronization protocols and their trade-offs in maintaining consistent time across distributed systems.
- 3. Demonstrate inter-process communication mechanisms, remote procedure calls, message passing, and distributed object systems.
- 4. Apply distributed shared memory and data management techniques for replication strategies.
- 5. Solve issues like deadlocks, race conditions and conflicts in a distributed environment.

### Subject: FABRICATION PROCESS Course code: 2070303 Course Outcomes.

- 1. Understand the basics of casting and gain detailed knowledge of the sand-casting process
- 2. Learn the Fundamentals of welding, including advanced welding techniques and their Industrial applications
- 3. Gain insight into various sheet metal forming methods such as Bending, Drawing, Stamping and Rolling
- 4. Understand the process of plastic materials including molding Extrusion

5. Acquire Basic knowledge of powder metallurgy and understand the importance of Additive Manufacturing in modern Industry.

# Subject: Full Stack Development Lab Course code: 2070583

## **Course Outcomes.**

- 1. Understand the architecture of full-stack development including front-end, back-end and database layers and their integration on web applications.
- 2. Demonstrate front-end technologies, including HTML, CSS and JavaScript for creating responsive and interactive user interfaces
- 3. Apply Databases with JDBC, Hibernate and spring Boot in Real Time applications.
- 4. Evaluate the performance, scalability and usability of full-stack applications, applying optimization techniques for improved user experience.
- 5. Make use of databases both relational (SQL) and non-relational (NOSQL) to design query and manage data for web applications.

#### Subject: Machine Learning Lab Course code: 2070584 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: Industry Oriented Mini Project/Summer Internship Course code: 2070585

- 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: Project Stage-I Course code: 2070586 Course Outcomes

- 1. Identify and formulate a problem for developing a project with given general objectives and guidelines
- 2. Use research-based knowledge and methods including design of experiments analysis and interpretation of data and synthesis of information
- 3. Design solution for problems and system components or processes that meet the specified needs
- 4. Apply appropriate techniques resources and tools for various activities of solution
- 5. Communicate results, concepts, analyses and ideas in written and oral form.

### VIII Sem

### Subject: Deep Learning Course code: 2080558 Course Outcomes.

- 1. Differentiate between 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.

## Subject: Web Services Course code: 2080563

- 1. Assess the role web services in service-oriented architecture.
- 2. Analyze the significance of Web Services Description Language and Universal Description, Discovery, and Integration in real-time applications.
- 3. Demonstrate interoperability of Simple Object Access Protocol, web services across platforms by leveraging XML structure.
- 4. Assess service discovery using Universal Description Discovery and Integration registries and interpret service descriptions in web applications
- **5.** Identify key security challenges including confidentiality, integrity, and availability in Service-Oriented Architecture and web services

### Subject: Disaster management Course code: 2080103 Course Outcomes.

- 1. Classify Environmental hazards for developing modern disaster management system
- 2. Compare natural and manmade disasters for finding out intensity of damage loss occurred by them
- 3. List various hazards and their effects for evaluating their impact on society and Environment
- 4. Outline human adjustments and perception towards hazards for mitigation of disasters
- 5. Summarize disaster phenomenon and its different contextual aspects for implementing the Disaster Risk Reduction Strategy

### Subject: Technical Seminar

### Course code: 2080587

### **Course Outcomes.**

- 1. Demonstrate the ability to research, analyze, and summarize recent advancements in engineering or technology.
- 2. Develop and deliver effective technical presentations using clear communication, structured content, and appropriate visual aids.
- 3. Exhibit confidence and professionalism in presenting technical ideas and answering audience questions.
- 4. Enhance collaboration and teamwork by engaging in peer discussions and providing constructive feedback during technical seminars.
- 5. Improve lifelong learning skills by exploring and adapting to emerging technologies and innovative practices in the chosen domain.

### Subject: Project Stage-II Course code: 2080588 Course Outcomes.

- 1. Apply appropriate techniques, resource, and tools for various activities of solution
- 2. Develop an in-depth skill to use modern tools and techniques
- 3. Analyze data to produce useful information and draw conclusions
- 4. Communicate results, concepts, analyses and ideas in written and oral form oral
- 5. Conduct an extended independent investigation that results in the production of a research thesis

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