TEEGALA KRISHNA REDDY ENGINEERING COLLEGE

(UGC-Autonomous)

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated to JNTUH
Accredited by NAAC with 'A' Grade. Accredited by NBA

Medbowli, Meerpet, Balapur(M), Hyderabad, Telangana- 500097
Mob: 8498085218. Email: info@tkrec.ac.in, www.tkrec.ac.in

Department of Computer Science and Engineering

Students who joinedfrom2022-2023(R22)

Course Outcomes	**Course Name:**Matrices and Calculus**Course Code:**22MA101BS
CO 1	Write the matrix representation of a set of linear equation s and to analyze the solution of the system of equations
CO 2	Find the Eigen values and Eigen vectors and reduce the quadratic form to canonical form using orthogonal transformations.
CO 3	Apply the mean value theorems and evaluate the improper integrals using Beta and Gamma functions.
CO 4	Find the extreme values of functions of two variables with / without constraints.
CO 5	Evaluate the multiple integrals and apply the concept to find areas, volumes.

Course Outcomes	**Course Name:**Engineering Chemistry**Course Code:**22CH102BS
CO 1	Apply the principle of potable water for industrial and domestic purposes
CO 2	Identify the electrolytic and electrochemical cells with different types of batteries and make use of corrosion control methods in industry.
CO 3	Explore the fundamental properties of polymers and other materials in engineering field
CO 4	Distinguish various types of fuels and their applications in day-to-day life
CO 5	Develop understanding of engineering materials like cement, smart materials and Lubricants.

Course Outcomes	**Course Name:**Basic Electrical Engineering**Course Code:**22EE104ES
CO 1	Verify the basic Electrical circuits through different experiments.
CO 2	Evaluate the performance calculations of Electrical Machines and Transformers

	through various testing methods.
CO 3	Analyze the transient responses of R, L and C circuits for different input conditions.
CO 4	To determine the performance of different types of DC, AC machines and Transformers.
CO 5	To import the knowledge of various electrical installations and the concept of power, power factor and its improvement.

Course Outcomes	**Course Name:**Computer Aided Engineering Graphics**Course Code:**22ME105ES
CO 1	Apply the principles of Engineering Graphics to create Engineering Drawings of various geometric constructions, conic sections, curves and scales as per BIS standards.
CO 2	Construct orthographic projections for points, lines and planes in different quadrants and Auxiliary views.
CO 3	Draw the sectional views and true shape of sections of solids, by applying principles of projections.
CO 4	Draw the development of surfaces in real time situations.
CO 5	Develop isometric and orthographic views of the objects

Course Outcomes	**Course Name:**Elements of Computer Science & Engineering**Course Code:**22CS106ES
CO 1	Know the working principles of functional units of a basic Computer
CO 2	Understand program development, the use of data structures and algorithms in problem solving.
CO 3	Know the need and types of operating system, database systems.
CO 4	Understand the significance of networks, internet, and WWW and cyber security.
CO 5	Understand Autonomous systems, the application of artificial intelligence

Course Outcomes	**Course Name:**Engineering Chemistry Laboratory**Course Code:**22CH107BS
CO 1	Determination of parameters like hardness of water and rate of corrosion of mild steel in various conditions.
CO 2	Performing experimental methods such as conductometry, potentiometry and pH metre in order to find out the concentrations or equivalence points of acids and bases.

CO 3	Preparation of polymers like Bakelite and nylon-6.
CO 4	Estimation of saponification value, surface tension and viscosity of lubricant oils.
CO 5	Estimation of different types of qualitative and quantitative measurements of a given compound.

Course Outcomes	**Course Name:**Basic Electrical Engineering Laboratory **Course Code:**22EE109ES
CO 1	Verify the basic Electrical DC and AC circuits through different experiments.
CO 2	Evaluate the performance calculations of Transformers through various testing methods.
CO 3	Evaluate the performance calculations of DC Electrical Machines through various testing methods.
CO 4	Evaluate the performance calculations of AC Electrical Machines through various testing methods.
CO 5	Analyze the simple circuit for lighting and power installations.

Course Outcomes	**Course Name:**Ordinary Differential Equations and Vector Calculus **Course Code:**22MA201BS
CO 1	Identify whether the given differential equation of first order is exact or not.
CO 2	Apply the concept of differential equation to real world problems.
CO 3	Use the Laplace transforms techniques for solving ODE's.
CO 4	Use gradient to evaluate directional derivatives and conservative vector field.
CO 5	Calculate the line, surface and volume integrals and converting them from one to another.

Course Outcomes	**Course Name:**Applied Physics **Course Code:**22PH202BS
CO 1	Gain knowledge on fundamentals of modern physics and quantum mechanics, and utilize the knowledge in various applications.
CO 2	Able to apply various electronic circuits by the fundamentals of semiconductor physics.
CO 3	Study the fundamental concepts related to the dielectric, magnetic materials and superconductors

CO 4	Identify the importance of nano scale, quantum confinement and various fabrications
CO 5	Able to apply the learned knowledge of LASER and Fibre optics in communication systems.

Course Outcomes	**Course Name:**EngineeringWorkshop**Course Code:**22ME203ES
CO 1	Demonstrate various machines, tools and their operations.
CO 2	Apply different workshop trades like fitting, carpentry, foundry and welding.
CO 3	Practice work shop trades like Tim smithy, Black smithy.
CO 4	Apply suitable tools for different trades of engineering processes including drilling, material removing, measuring, chiseling.
CO 5	Apply basic electrical engineering knowledge for house wiring practice.

Course Outcomes	**Course Name:**English for Skill Enhancement**Course Code:**22EN204HS
CO 1	Choose appropriate vocabulary and sentence structures for their oral and written communication.
CO 2	Demonstrate their understanding of the rules of functional grammar.
CO 3	Develop comprehension skills from the known and unknown passages.
CO 4	Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.
CO 5	Acquire basic proficiency in reading and writing modules of English.

Course Outcomes	**Course Name:**Electronic Devices and CircuitsCourse**Course Code:**22EC205ES
CO 1	Apply the concepts of Diode applications.
CO 2	Apply concepts of Non-Linear application in solving various problems.
CO 3	Analyse the switching concepts of BJT
CO 4	Compare BJT with FET and MOSFET
CO 5	Design circuits using Special Purpose Devices

Course	**Course Name:**Applied Physics Laboratory**Course Code:**22PH207BS

Outcomes	
CO 1	Able to study the (V-I/P-I) characteristics of LED, LASER and Solar cell.
CO 2	Able to understand the energy gap of semiconductor diode
CO 3	Correlate the theory of Hall Effect with experiment by determining the Hall coefficient.
CO 4	Examine the Bending losses for different Optical fiber cables.
CO 5	Able to understand various concepts-Resonance, Time constant and Magnetic field using LCR, RC, Stewart and Gees circuits.

Course Outcomes	**Course Name:**English Language and Communication Skills Laboratory**Course Code:**22EN208HS
CO 1	Employ the nuances of English language through audio-visual experience and group activities.
CO 2	Articulate a neutral accent of English for intelligibility by overcoming mother tongue influence.
CO 3	Develop the skill of using appropriate language in various speaking contexts.
CO 4	Understand how to use language to make formal presentations.
CO 5	Interpret speaking skills with clarity and confidence which in turn enhances their interpersonal skills.

Course Outcomes	**Course Name:**DigitalElectronics**Course Code:**22EC308PC
CO 1	Apply concepts of numerical information in different forms and Boolean Algebra theorems.
CO 2	Analyse Postulates of Boolean algebra and to minimize combinational functions, and design the combinational circuits.
CO 3	Analyse Combinational Circuits for various cyclic functions.
CO 4	Design sequential circuits
CO 5	Design of Programmable Devices

urse Outcomes	**Course Name:** Programming for Problem Solving **Course Code:** 22CS103ES
CO1	CO1: Build the algorithm for the given unsolved problems.
CO2	CO2: Apply the concepts of arrays, pointers, strings and structures to find the solution for given problem
CO3	CO3: Apply the various pre-processor commands in a given different real time situations

CO4	CO4: Dissect a problem into sub functions to develop modular reusable code
CO5	CO5: Demonstrate various searching and sorting techniques along with the complexity analysis

Course Outcomes	**Course Name:**Programming for Problem Solving Laboratory**Course Code:** 22CS108ES
CO1	Formulate the algorithms for simple problems
CO2	Translate the given algorithms to C Programs
CO3	Build the logic using arrays, strings for the given problem
CO4	Make use of pointers in different types to modularize the code with functions
CO5	Apply the appropriate sorting techniques for the given list of elements

Course Outcomes	**Course Name**: Python Programming Laboratory **Course Code:**22CS206ES
CO1	Develop the application specific codes using python.
CO2	Understand Strings, Lists, Tuples and Dictionaries in Python
CO3	Verify programs using modular approach, file I/O, Python standard library
CO4	Implement Digital Systems using Python
CO5	Learn NumPy, PlotPy, SCIpy packages

Course Outcomes	**Course Name:**IT Workshop**Course Code:**22CS209ES
CO1	Perform Hardware trouble shooting
CO2	Understand Hardware components and interdependencies
CO3	Safeguard computer systems from viruses /worms
CO4	Document/ Presentation preparation
CO5	Perform calculations using spread sheets

Course Outcomes	**Course Name:**Data Structures**Course Code**:22CS301PC
CO1	Construct appropriate data structures to represent data items in real-world problems with linear data structures.
CO2	Ability to apply the linear representations of skip lists and dictionaries and hash tables to overcome problems of sequential data structures.
CO3	Ability to design programs using a variety of non-linear data structures balanced trees
CO4	Able to implement the principal algorithms graph traversal methods. and searching, and sorting.
CO5	Implement and know the applications of pattern matching.

Course Outcomes	**Course Name:**ComputerOrientedStatisticalMethods **Course Code:**22MA302BS
CO1	Apply the concept of probability and Random variables in solving given Real time problems.
CO2	Formulate and solve problems involving random variables and apply statistical methods for analysing experimental data.
CO3	Apply various concepts of distribution to find out continuous distribution values
CO4	Apply concept so estimation and testing of hypothesis to case studies.
CO5	Describe Stochastic Principles to simplify processes that satisfy Markov property.

Course Outcomes	**Course Name:**ComputerOrganizationandArchitecture **Course Code:**22CS302PC
CO1	Understand the basics of instruction sets and their impact on processor design.
CO2	Demonstrate an understanding of the design of the functional units of a digital computer system.
CO3	Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
CO4	Design a pipeline for consistent execution of instructions with minimum hazards.
CO5	Recognize and manipulate representations of numbers stored in digital computers

Course Outcomes	**Course Name:**ObjectOrientedProgramming throughJava **Course Code** 22CS303PC
CO1	Demonstrate the behaviour of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.
CO2	Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords
CO3	Use multithreading concepts to develop inter process communication.
CO4	Understand the process of graphical user interface design and implementation using AWT or swings.
CO5	Develop applets that interact abundantly with the client environment and deploy on the server.

Course Outcomes	**Course Outcomes**DataStructuresLab **Course Code:** 22CS304PC
CO1	Identity the appropriate data structure to solve various problems
CO2	Implement various list operations by using pointers and dynamic memory allocation
CO3	Implementing linear data structures stack, queue operations by using arrays and pointers.
CO4	Implement various sorting algorithms
CO5	Implement various non-linear data structures trees, graphs operations.

Course Outcomes	**Course Name:**Object Oriented Programming through Java Lab**Course Code:** 22CS305PC

CO1	Able to write programs for solving real world problems using the java collection framework.
CO2	Able to write programs using abstract classes.
CO3	Able to write multithreaded programs.
CO4	Able to write GUI programs using swing controls in Java.
CO5	Create web pages using Applets for example problem.

Course Outcomes	**Course Name:**GenderSensitizationLab**Course Code:**22MC309
CO1	Students will have developed a better understanding of important issues related to gender in contemporary India.
CO2	Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
CO3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it. Students will acquire insight into the gendered division of labor and its relation to politics and economics.
CO4	Men and women students and professionals will be better equipped to work and live together as equals. Students will develop a sense of appreciation of women in all walks of life.
CO5	Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

Course Outcomes	**Course Name:**SkillDevelopmentCourse(Datavisualization-R Programming/PowerBI)**Course Code:**22CS306PC
CO1	Understand How to import data into Tableau.
CO2	Understand Tableau concepts of Dimensions and Measures.
CO3	Develop Programs and understand how to map Visual Layouts and Graphical Properties.
CO4	Create a Dashboard that links multiple visualizations.
CO5	Use graphical user interfaces to create Frames for providing solutions to real world problems.

Course Outcomes	**Course Name:**Discrete Mathematics**Course Code:**22MA401BS
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
CO5	Apply graph theory in solving computing problems

Course Outcomes	**Course Name:**Business Economics & Financial Analysis**Course Code:**22HS401MS
CO1	Understand and Learn the Business Economic Concepts in Micro and Macro Business firm
CO2	Understand microeconomic factors in related to demand and supply analysis and its forecasting
CO3	Apply the theory of production function and Cost concepts to determine the Break-Even Analysis. Remember different market structures, pricing strategies and different forms business organization
CO4	Determine the financial statement by using Fundamental accounting concepts
CO5	Interpret the financial statement by using Fundamental accounting concepts and Ratio analysis

Course Outcomes	**Course Name:**Operating Systems**Course Code:**22CS401PC
CO1	Understanding of basic system calls and processes in Operating system
CO2	Getting Knowledge of process scheduling algorithms and mechanism for overcoming deadlocks
CO3	Understanding about process management, synchronization of process and how inter process communication is done among the processes.
CO4	Able to understand about the working mechanism of memory management and how virtual memory is used for handling multiple processes.
CO5	Knowing the file system interfaces and operations on files.

Course Outcomes	**Course Name:**Database Management Systems**Course Code:**22CS402PC
CO1	Construct the E-R model to represent databases on real world problems.
CO2	Experiment with queries and nested queries on real world problems by using several operators like join, set, and aggregate.
CO3	Plan and relate the concept of data planning and database design using normalization.
CO4	Utilize the ACID properties in transaction management and interpret concurrency control mechanisms.
CO5	Categorize various file organizations and indexing for faster retrieval of data, persistent storage of data.

Course Outcomes	**Course Name:**Software Engineering**Course Code:**22CS403PC
CO1	Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).
CO2	Identifyandapplyappropriatesoftwarearchitecturesandpatternstocarryouthighleveldesignofa system and be able to critically compare alternative choices.
CO3	Willhaveexperienceand/orawarenessoftestingproblemsandwillbeabletodevelopasimpletestingreport.
CO4	Recognize the importance of software maintenance and complexities involved in software evolution.

CO5	Able to learn various processes used in all the phases of the product.

Course Outcomes	**Course Name**: Operating Systems Lab**Course Code:**22CS404PC
CO1	Simulate and implement operating system concepts such as scheduling and system calls
CO2	Illustrating the process of deadlock management, and semaphore
CO3	Understanding the working IPC mechanisms with an example
CO4	Implement operating system concepts file management and memory management.
CO5	Able to implement Page replacement policies.

Course Outcomes	**Course Name:**Database Management Systems Lab**Course Code:**22CS405PC
CO1	Design a database schema for given problem data.
CO2	Build a GUI application.
CO3	Apply the normalization techniques for development of application software to realistic problems.
CO4	Formulate queries using SQL DML/DDL/DCL commands.
CO5	Implement triggers to raise as per real time data and also Implement concurrency control mechanisms.

Course Outcomes	**Course Name:** Real-time Research Project/ Societal Related Project**Course Code:**22CS401PW
CO1	Enable the Students to undertake short research projects in a team under the direction of members of the faculty.
CO2	Enable the students to identify a topic of interest and complete the preliminary work of undertaking case studies, data collection and feasibility studies.
CO3	Produce, improve and/or refine technical aspects for engineering products or components.
CO4	Enable the students to undertake fabrication work of new experimental set up/devices or develop software packages
CO5	Communicate their components by making an oral presentation before an evaluation committee

Course Outcomes	**Course Name:**Skill Development Course (Node JS/ React JS/ Django) Course**Code:**22CS406PC
CO1	Build a custom website with HTML, CSS, and Bootstrap and little JavaScript.
CO2	Demonstrate Advanced features of JavaScript and learn about JDBC

CO3	Develop Server – side implementation using Java technologies like
CO4	Develop the server – side implementation using Node JS.
CO5	Design a Single Page Application using React.

Course Outcomes	**Course Name:**Constitution of India**Course Code:**22MC410
CO1	Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
CO2	Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
CO3	Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
CO4	Discuss the passage of the Hindu Code Bill of 1956.
CO5	Discuss the Election Commission roles and functioning

Course Outcomes	**Course Name:**Design and Analysis of Algorithms **Course Code:**22CS501P
CO1	Able to evaluate the performance Analysis and Make use of divide and conquer methods for developing algorithms.
CO2	Apply the concept of backtracking to solve the optimization problems.
CO3	Solve the optimization problems using dynamic programming methodology
CO4	Solve the optimization problem by using Greedy method.
CO5	Solve the optimization problem by using branch and bound method and NP-Hard and NP Complete for the given example problems

Course Outcomes	**Course Name:**Computer Networks **Course Code:**22CS502PC
CO1	Demonstrate the concepts of Data communication procedures and various models of Networking
CO2	Summarize the features of various protocols used in Data Link Layer.
CO3	Identify appropriate routing algorithm for broadcasting in Network Layer and understanding addressing
CO4	Demonstrate the services and features of TCP/UDP protocols in Transport Layer
CO5	Summarize the services and features of Application Layer with respect to WWW

Course Outcomes	**Course Name:**DevOps **Course Code:**22CS503P
CO1	Identify components of Devops environment
CO2	Describe Software development models and architectures of DevOps
CO3	Apply different project management, integration, testing and code deployment tool
CO4	Investigate different DevOps Software development models and best practices

CO5	Collaborate and adopt Devops in real-time projects

Course Outcomes	**Course Name:**Computer Networks Lab **Course Code:**22CS504PC
CO1	Implement data link layer farming methods
CO2	Analyses 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 Outcomes	**Course Name:**DevOps Lab **CourseCode:**22CS505PC
CO1	Identify components of Devops environment
CO2	Apply different project management, integration, testing and code deployment tool
CO3	Investigate different DevOps Software development, models
CO4	Demonstrate continuous integration and development using Jenkins
CO5	CO5: Apply Automated Testing (selenium) for testing a web application

Course Outcomes	**Course Name:**Advanced Communication Skills Lab **Course Code:**22EN
CO1	To improve the students' fluency in English, with a focus on vocabulary
CO2	To enable them to listen to English spoken at normal conversational speed by educated English speakers
CO3	To respond appropriately in different socio-cultural and professional contexts
CO4	To communicate their ideas relevantly and coherently in writing
CO5	To prepare the students for placements

Course Outcomes	**Course Name:**Intellectual Property Rights **Course Code:**22MC510
CO1	Define intellectual property and its importance in modern society
CO2	Describe the historical and legal development of intellectual property
CO3	Analyze the criteria for patent infringement and the remedies available for patent holders
CO4	Discuss the fair use doctrine and other exceptions to copyright protection
CO5	Explain the elements of trade secret protection and strategies for maintaining secrecy

Course Outcomes	**Course Name:**Skill Development Course (UI design- Flutter) **Course Code:**22CS506PC
CO1	Installation of flutter and related tools and understanding the architecture of flutter

CO2	Creating application with various features
CO3	Learning Dart basics and creating application on the dart
CO4	Learn to create the project templates for the applications
CO5	Using various widget and animations to create a mobile app

Course Outcomes	**Course Name:**Machine Learning **Course Code**:22CS601PC
CO1	Tell the concepts of computational intelligence in machine learning
CO2	To apply machine learning techniques to address the real time problems in different areas.
CO3	:nfer the Neural Networks and its usage in machine learning application.
CO4	Application & implementation of Decision trees
CO5	Gain knowledge on Bayesian Networks, Reinforcement Algorithms & analytical learning

Course Outcomes	**Course Name:**Formal Languages and Automata Theory **Course Code:**22CS602PC
CO1	Make use of the concept to automata and to recognize the appropriate languages.
CO2	Model finite state machine for the given regular expression and languages.
CO3	Construct context free grammars for any given formal languages.
CO4	Construct Turing machine for the given grammar.
CO5	Distinguish between decidability and undecidability.

Course Outcomes	**Course Name: Artificial Intelligence Course Code: 22CS603PC**
CO1	Ability to formulate an efficient problem space for a problem expressed in natural language.
CO2	Select a search algorithm for a problem and estimate its time and space complexities.
CO3	Possess the skill for representing knowledge using the appropriate technique for a given problem.
CO4	Possess the ability to apply AI techniques to solve problems of game playing, and machine learning.
CO5	Ability to design Expert system

Course Outcomes	**Course Name:**Machine Learning Lab **Course Code:**22CS604PC
CO1	Memorize the basics of Python programming.
CO2	Implement modern notions in data analysis-oriented computing

CO3	Analysing data sets using python programming.
CO4	Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own
CO5	Be capable of performing experiments in Machine Learning using real-world data.

Course Outcomes	**Course Name:** Industrial Oriented Mini Project/ Internship/ Skill Development Course (Big data-Spark) **Course Code:**22CS606PC
CO1	Develop Map Reduce Programs to analyze large data set Using Hadoop and Spark
CO2	Write Hive queries to analyze large dataset Outline the Spark Eco system and its components
CO3	Perform the filter, count, distinct, map, flat Map RDD Operations in Spark.
CO4	Build Queries using Spark SQL
CO5	Apply Spark joins on Sample Data Sets

Course Outcomes	**Course Name:**Environmental Science **Course Code:**22MC
CO1	Know basic concept of ecological perspective and the value of the environment.
CO2	Understand the significance of various natural resources and its management.
CO3	Demonstrate a comprehensive understanding of the world's biodiversity and the importance of its conservation.
CO4	Identify different types of pollution and their control measures, discover effective methods of waste management and come out with best possible solutions.
CO5	Raise awareness about environmental laws and sustainable development.

Course Outcomes	**Course Name:**Cryptography and Network Security**Course Code:**22CS701PC
CO1	Able to understand the basics of security concepts, cryptography Techniques and Implement these in a real time environment.
CO2	Able to analyze the mechanisms of different cryptographic algorithms and find out the Efficiency of these in a given real time environment.
CO3	Able to understand & Implement Authentication techniques on Information.
CO4	Ability to identify wireless network security approaches in real time.
CO5	Able to understand current legal issues towards information security.

Course Outcomes	**Course Name:**Compiler Design **Course Code:**22CS702PC
CO1	Use Lex and Yacc tools for developing a scanner and a parser.
CO2	Make use of LL and LR parsers to develop the Parse tree.
CO3	Generate intermediate code for procedures.
CO4	Identify appropriate method for code generation.
CO5	Apply proper techniques for code optimization.

Course Outcomes	**Course Name:**Cryptography and Network Security Lab **Course Code:**22CS703PC
CO1	Able to understand the conversion of plain text to cipher text and cipher text to plain text
CO2	Able to analyze the mechanisms of different cryptographic algorithms and find out the Efficiency of these in a given real time environment. (ex: DES
CO3	Able to understand &implementRijndael algorithm
CO4	Ability to identify RSA algorithm
CO5	Able to understand an implement message digest with mD5

Course Outcomes	**Course Name:**Compiler Design Lab**Course Code**: 22CS704PC
CO1	Design and develop interactive and dynamic web applications using HTML, CSS, JavaScript and XML
CO2	Apply client-server principles to develop scalable and enterprise web applications.
CO3	Ability to design, develop, and implement a compiler for any language.
CO4	Able to use lex and yacc tools for developing a scanner and a parser.
CO5	Able to design and implement LL and LR parsers.

Course Outcomes	**Course Name:**Project Stage – I**Course Code:**22CS702PW
CO1	Identify the problem by applying acquired knowledge.
CO2	Analyze and categorize executable project modules after considering risks
CO3	Choose efficient tools for designing project modules.
CO4	Combine all the modules through effective team work after efficient testing.
CO5	Elaborate the completed task and compile the project report.

Course Outcomes	**Course Name:**Organisational Behaviour**Course Code:**22CS801PC
CO1	Upon the completion of the subject, the student will be able to analyse the behaviour of individuals and groups in organizations in terms of the key factors that influence organizational behaviour.
CO2	Assess the potential effects of organizational level factors (such as structure, culture and change) on organizational behaviour.
CO3	Critically evaluate the potential effects of important developments in the external

	environment (such as globalization and advances in technology) on organizational behaviour.
CO4	Analyse organizational behavioural issues in the context of organizational behaviour theories, models and concepts.
CO5	Describe the different theories related to Individual behavior in the Organization

Course Outcomes	**Course Name:** Project Stage - II including Seminar**Course Code:**22CS803PW
CO1	Identify and Finalize problem statement by surveying variety of domains.
CO2	Perform requirement analysis and identify design methodologies
CO3	Apply advanced programming techniques
CO4	Present technical report by applying different visualization tools and Evaluation metrics.
CO5	Apply engineering and management principles to achieve project goal.

Course Outcomes	**Course Name:**Quantum Computing**Course Code:** 22CS510PE
CO1	Understand basics of quantum computing
CO2	Understand physical implementation of Qubit
CO3	Understand Quantum algorithms and their implementation
CO4	Understand the Impact of Quantum Computing on Cryptography
CO5	Understand the Noise and error correction techniques

Course Outcomes	**Course Name:**Advanced Computer Architecture**Course Code:** 22CS511PE
CO1	Sketch the concept of Computational models and Computer Architectures.
CO2	Illustrate the concepts of parallel computer models.
CO3	Tell about Scalable Architectures, Pipelining, Super scalar processors, and multiprocessors
CO4	Write about Multisector& SIMD computers
CO5	Demonstrate Multithreaded & Hybrid computers

Course Outcomes	**Course Name:**Data Analytics**Course Code:** 22CS512PE
CO1	Understand the impact of data analytics for business decisions and strategy
CO2	Understand the impact of data analytics for business decisions and strategy
CO3	To carry out standard data visualization and formal inference procedures
CO4	Design Data Architecture
CO5	Understand various Data Sources

Course Outcomes	**Course Name:**Image Processing**Course Code:**22CS513PE
CO1	Review the fundamental concepts of a digital image processing system.
CO2	Analyze images in the frequency domain using various transforms.
CO3	Evaluate the techniques for image enhancement and image restoration.
CO4	Categorize various compression techniques.
CO5	Interpret Image compression standards.

Course Outcomes	**Course Name:**Principles of Programming Languages**Course Code:** 22CS514PE
CO1	Acquire the skills for expressing syntax and semantics informal notation.
CO2	Identify and apply a suitable programming paradigm for a given computing application.
CO3	Gain knowledge of and able to compare the features of various programming languages.
CO4	Demonstrating the use of scripting languages
CO5	Finding various data types of different programming languages.

Course Outcomes	**Course Name:**Computer Graphics**Course Code:** 22CS520PE
CO1	Understand the fundamental algorithms used in computer graphics and to some extent be able to compare and evaluate them.
CO2	Able to design, develop, and modify electronically generated imaginary using a wide range of sophisticated graphical tools and techniques.
CO3	Able to summarize different hidden surface elimination algorithms and shading techniques used in computer graphics and digital media production.
CO4	Able to explain about the technology necessary for creating multimedia content for the web, video, DVD, 2D and 3D graphics, Sound and programming.
CO5	Apply the knowledge, techniques, skills and modern tools to become successful professionals in communication and media industries.

Course Outcomes	**Course Name:**Embedded Systems**Course Code:**22CS521PE
CO1	Expectedtounderstandtheselectionprocedureofprocessorsintheembeddeddomain.
CO2	Design procedure of embedded firmware.
CO3	Expected to visualize the role of real time operating systems in embedded systems.
CO4	Expected to evaluate the correlation between task synchronization and latency issues
CO5	Understand how the OS based embedded System works

Course Outcomes	**Course Name:**Information Retrieval Systems**Course Code:** 22CS522PE
CO1	Ability to apply IR principles to locate relevant information large collections of data
CO2	Ability to design different document clustering algorithms.

CO3	Implement retrieval systems for web search tasks.
CO4	Design an Information Retrieval System for web search tasks.
CO5	Ability to imply text search techniques.

Course Outcomes	**Course Name:**Distributed Databases **Course Code:**22CS523PE
CO1	Understand theoretical and practical aspects of distributed database systems.
CO2	Study and identify various issues related to the development of distributed database system.
CO3	Understand the design aspects of object-oriented database system and related development.
CO4	Interpret the concepts of Distributed DBMS and Parallel Database Systems
CO5	Determine the various design aspects of an object-oriented database system

Course Outcomes	**Course Name:**Natural Language Processing **Course Code:**22CS524PE
CO1	Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
CO2	Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems
CO3	Able to manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.
CO4	Able to design, implement, and analyze NLP algorithms
CO5	Able to design different language modelling Techniques.

Course Outcomes	**Course Name:**Full Stack Development **Course Code:** 22CS630
CO1	Understand Full stack components for developing web application.
CO2	Apply packages of NodeJS to work with Data, Files, HttpRequests and Responses.
CO3	Use MongoDB data base for storing and processing huge data and connects with NodeJS application.
CO4	Design faster and effective single page applications using Express and Angular.
CO5	Create interactive user interfaces with react components.

Course Outcomes	**Course Name:** Internet of Things **Course Code:**22CS631PE
CO1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
CO2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
CO3	Appraise the role of IoT protocols for efficient network communication.

CO4	Identify the applications of IoT in Industry.
CO5	Interpret the impact and challenges posed by IoT networks leading to new architectural models.

Course Outcomes	**Course Name:** Scripting Languages**Course Code:**22CS632PE
CO1	Acquire the skills for expressing syntax and semantics informal notation.
CO2	Identify and apply a suitable programming paradigm for a given computing application.
CO3	Gain knowledge of and able to compare the features of various programming languages.
CO4	Demonstrate the use of scripting languages
CO5	Demonstrate various data types of different programming languages.

Course Outcomes	**Course Name:**Mobile Application Development **Course Code:**22CS633PE
CO1	To demonstrate their understanding of the fundamentals of Android operating systems
CO2	To improves their skills of using Android software development tools
CO3	To demonstrate their ability to develop software with reasonable complexity on mobile platform
CO4	To demonstrate their ability to deploy software to mobile devices
CO5	To demonstrate their ability to debug programs running on mobile devices

Course Outcomes	**Course Name:**Software Testing Methodologies **Course Code:**22CS634PE
CO1	Understand purpose of testing and path testing
CO2	Understand strategies in dataflow 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 Outcomes	**Course Name:**Full Stack Development Lab **Course Code:** 22CS635PE
CO1	Design flexible and responsive Web applications using NodeJS, React, Express and Angular.
CO2	Perform CRUD operations with MongoDB on huge amount of data.
CO3	Develop real time applications using react components.
CO4	Use various full stack modules to handle http requests and responses.
CO5	Create web pages that function using external data.

Course	**Course Name:**Internet of Things Lab **Course Code:**22CS636PE

Outcomes	
CO1	Ability to introduce the concept of M2M(machine to machine) with necessary protocols and get awareness in implementation of distance sensor
CO2	Get the skill to program using python scripting language which is used in many IoT devices
CO3	Creating programs using Node MCU and sensors
CO4	Configuring and creatingprograms on RaspberryPi
CO5	Create A DJANGO project and app for collecting the IOT data

Course Outcomes	**Course Name:**Scripting Languages Lab **Course Code:**22CS637PE
CO1	Infer the differences between Scripting languages and programming languages
CO2	Acquire the knowledge of ruby programming.
CO3	Make use of Perl programming for given problems.
CO4	Design applications by using TCL programming.
CO5	Develop application using scripting languages.

Course Outcomes	**Course Name:**Mobile Application Development Lab**Course Code:**22CS638PE
CO1	Understand the working of Android OS Practically.
CO2	Develop user interfaces
CO3	Create application and linking with database.
CO4	Develop application with CRUD operations.
CO5	Develop, deploy and maintain the Android Applications.

Course Outcomes	**Course Name:**Software Testing Methodologies Lab**Course Code:**22CS639PE
CO1	Understand the working of Android OS Practically.
CO2	Develop user interfaces.
CO3	Create application and linking with database.
CO4	Develop application with CRUD operations.
CO5	Develop, deploy and maintain the Android Applications.

Course Outcomes	**Course Name:**Graph Theory **Course Code:**22CS740PE
CO1	Know some important classes of graph theoretic problems and algorithms
CO2	apply graph theory concepts in core subjects such as data structures and network theory effectively
CO3	Construct minimum spanning tree using some algorithms and identify tree traversals
CO4	Be able to formulate and prove central theorems about trees, matching, connectivity.

CO5	Be able to use graph theory as a modelling tool and formulate and prove theorems on colouring and planar graphs

Course Outcomes	**Course Name:** Advanced Operating Systems **Course Code:** 22CS741PE
CO1	Understand the design approaches of advanced operating systems
CO2	Analyze the design issues of distributed operating systems.
CO3	Evaluate design issues of multi-processor operating systems.
CO4	Identify the requirements Distributed File System and Distributed Shared Memory.
CO5	Formulate the solutions to schedule the real time applications.

Course Outcomes	**Course Name:** Soft Computing **Course Code:** 22CS742PE
CO1	Identify the difference between Conventional Artificial Intelligence to Computational Intelligence.
CO2	Understand fuzzy logic and reasoning to handle and solve engineering problems
CO3	Apply the Classification and clustering techniques on various applications.
CO4	Understand the advanced neural networks and its applications
CO5	Perform various operations of genetic algorithms, Rough Sets.

Course Outcomes	**Course Name:** Cloud Computing **Course Code:** 22CS743PE
CO1	Understand different computing paradigms and potential of the paradigms and specifically cloud computing
CO2	Understand cloud service types, cloud deployment models and technologies supporting and driving the cloud
CO3	Acquire the knowledge of programming models for cloud and development of software application that runs the cloud and various services available from major cloud providers
CO4	Understand the security concerns and issues in cloud computing
CO5	Acquire the knowledge of advances in cloud computing.

Course Outcomes	**Course Name:** Ad hoc & Sensor Networks **Course Code:** 22CS744PE
CO1	Ability to understand the state-of-the-art research in the emerging subject of Ad Hoc and Wireless Sensor Networks
CO2	Ability to solve the issues in real-time application development based on ASN.
CO3	Ability to conduct further research in the domain of ASN
CO4	Discuss the sensor characteristics and WSN layer protocols
CO5	Illustrate the issues of routing in WSN and Security of WSN

Course Outcomes	**Course Name:** Advanced Algorithms **Course Code:** 22CS750PE
CO1	Familiarize with advanced methods on analysis of algorithms

CO2	Familiarize with the graphs, graph matching and shortest path algorithms
CO3	Understand matrix computations and modulo representations
CO4	Understand string algorithms and Modulo Representation of integers
CO5	Understand randomized, approximation algorithms and computational complexity topics

Course Outcomes	**Course Name:**Agile Methodology**Course Code:** 22CS751PE
CO1	Identify basic concepts of agile methodology and Extreme programming
CO2	Analyze real customer involvement in collaboration
CO3	Discuss risk management and release of application
CO4	Understanding iteration planning incremental requirements
CO5	Understanding refactoring, incremental design and architecture

Course Outcomes	**Course Name:**Robotic Process Automation**Course Code:** 22CS752PE
CO1	Understand the concepts of Robotic Process Automation.
CO2	Apply the flow chart mechanism in various calculations.
CO3	Applying UiPath tool for debugging process
CO4	Design system managing techniques.
CO5	Create application for process automation using UiPath tool.

Course Outcomes	**Course Name:**Blockchain Technology**Course Code:** 22CS753PE
CO1	Understanding concepts behind crypto currency
CO2	Applications of smart contracts in decentralized application development
CO3	Understand frameworks related to public, private and hybrid blockchain
CO4	Create block chain for different application case studies
CO5	Deploying and maintaining the block chain code and creating the BOTs

Course Outcomes	**Course Name:**Software Process & Project Management**Course Code:**22CS754PE
CO1	Infer the concept of software process assessment and reference models.
CO2	To get knowledge of software economics, phases in the life cycle of software development, project organization, project control and process instrumentation.
CO3	To analyze the major and minor milestones, artifacts and metrics from management and technical perspective

CO4	To design and develop software product using conventional and modern principles of software project management
CO5	To analyze the case study and future project management.

Course Outcomes	**Course Name:**Computational Complexity**Course Code:**22CS860PE
CO1	Introduces to theory of computational complexity classes
CO2	Discuss about algorithmic techniques and application of these techniques to problems.
CO3	Introduce to randomized algorithms and discuss how effective they are in reducing time and space complexity.
CO4	Discuss about Graph based algorithms and approximation algorithms
CO5	Discuss about search trees

Course Outcomes	**Course Name:**Distributed Systems**Course Code:**22CS861PE
CO1	Understanding of Distributed Systems Concepts.
CO2	Design and Implementation of Distributed Applications.
CO3	Fault Tolerance and Resilience.
CO4	Distributed System Models.
CO5	Concurrency Control and Distributed Transactions.

Course Outcomes	**Course Name:**Deep Learning**Course Code:**22CS862PE
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 Outcomes	**Course Name:**Human Computer Interaction**Course Code:**22CS863PE
CO1	Build the fundamentals of Human Computer Interaction.
CO2	Apply the concepts of user interface.
CO3	Build the various interaction tasks
CO4	Apply various interaction tasks
CO5	Demonstrate various invaluable team-work experience

Course Outcomes	**Course Name:**Cyber Forensics**Course Code:**22CS864PE
CO1	Students will understand the usage of computers in forensic, and how to use various forensic tools for a wide variety of investigations.
CO2	It gives an opportunity to students to continue their zeal in research in computer forensics.
CO3	Formulate about the different types of crimes, to dramatize the usage of computers in forensic.
CO4	Implementation of various forensic tools for a wide variety of investigations.
CO5	Ability to use of virtual machines in cyber forensics.