



Department of Computer Engineering

Batch: 2019-23

Program Outcomes (PO)	
PO 1. Engineering Knowledge	PO 7. Environment and Sustainability
PO 2. Problem Analysis	PO 8. Ethics
PO 3. Design/Development of Solutions	PO 9. Individual and Team Work
PO 4. Conduct Investigations of Complex Problems	PO 10. Communication
PO 5. Modern Tool Usage	PO 11. Project Management and Finance
PO 6. The Engineer and Society	PO 12. Life-long Learning

Program Specific Outcomes (PSOs)

PSO1: An ability to develop software applications to solve real life problems.

PSO2: An ability to understand, analyze and develop computer programs for efficient design of computer-based systems of varying complexity.

Course Outcomes

Course Code: - FEC101

Course: - Engineering Mathematics-I

CO1	Apply the concepts of complex numbers to engineering problems.
CO2	Apply the knowledge of complex numbers to solve problems in hyperbolic functions and logarithmic functions.
CO3	Illustrate the basic principles partial differentiation.
CO4	Illustrate the knowledge of Maxima, Minima and Successive differentiation
CO5	Apply principles of basic operations of matrices, rank and echelon form of matrices to solve simultaneous equations.
CO6	Solve transcendental equations & system of linear equations using numerical methods and scilab programming

Course Outcomes

Course Code: - FEC102

Course: - Engineering Physics-I

CO1	Recall and apply quantum mechanical ideas to the motion of the particles.
CO2	Identify different types of crystal structures based on various parameters.
CO3	Identify types of semiconducting materials by Hall Effect and their various applications
CO4	Compare interference of light in various thin films and recognize applications in science and
CO5	Recalls the behaviour and types of Superconductors and Supercapacitors.
CO6	Identify different engineering materials and their applications.

Course Outcomes

Course Code: - FEC103

Course: - Engineering Chemistry-I

CO1	Explain the concept of microscopic chemistry in terms of atomic and molecular orbital theory and relate it to diatomic molecules.
CO2	Describe the concept of aromaticity and interpret it with relation to specific aromatic systems.



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CO3	Illustrate the knowledge of various types of intermolecular forces and relate it to real gases.
CO4	Interpret various transformations using thermodynamics.
CO5	Apply the knowledge of various polymers, fabrication methods, conducting polymers in various industrial fields.
CO6	Determine the quality of water and suggest suitable methods of treatment

Course Outcomes

Course Code: - FEC104

Course: - Engineering Mechanics

CO1	Illustrate the concept of force, moment and apply the same along with the concept of equilibrium in two- and three-dimensional system with the help of (FBD)
CO2	Demonstrate the understanding of centroid and its significant and locate the same
CO3	Correlate real life application to specific type of friction and estimate required force to overcome friction.
CO4	Establish relation between velocity and acceleration of a particle and analyse the motion by plotting the relation between them
CO5	Illustrate different types of motion and establish kinematic relations for rigid body
CO6	Analyse body in motion using force and acceleration, work-energy, impulse-momentum principles.

Course Outcomes

Course Code: - FEC105

Course: - Basic Electrical Engineering

CO1	Students will be able to explain fundamentals of DC circuits and apply knowledge for analysing network theorems in DC circuits
CO2	Students will be able to explain fundamentals and analyse single phase AC circuits.
CO3	Students will be able to explain the fundamentals and analyse three phase AC circuits.
CO4	Students will be able to explain the basic operation and analyse the performance of single-phase transformer.
CO5	Students will be able to explain the construction and basic operation of DC motors and generators

Course Outcomes

Course Code: - FEL101

Course: - Engineering Physics-I Lab

CO1	Perform the experiments based on interference in thin films and analyse the results.
CO2	Verify the theory learned in the module crystallography.
CO3	Perform the experiments on various semiconductor devices and analyse their characteristics.
CO4	Students will be able to present Idea and flow of mini project based on literature survey.

Course Outcomes

Course Code: - FEL102

Course: - Engineering Chemistry-I Lab

CO1	Determine Chloride content and hardness of water sample.
CO2	Determine free acid pH of different solutions.
CO3	Synthesize polymers, biodegradable plastics.
CO4	Determine viscosity of oil.

Course Outcomes

Course Code: - FEL103

Course: - Engineering Mechanics Lab

CO1	Apply the fundamental knowledge of software engineering.
CO2	Analyse requirements and prepare models.

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CO3	Plan, schedule and track the progress of the projects.
CO4	Apply various software design principles.
CO5	Identify risks, manage the change to assure quality in software projects.
CO6	Apply testing principles on software project and understand the maintenance concepts.

Course Outcomes

Course Code: - FEL104

Course: - Basic Electrical Engineering Lab

CO1	Students will be able to explain fundamentals of DC circuits and apply knowledge for analysing network theorems in DC circuits
CO2	Students will be able to explain fundamentals and analyse single phase AC circuits.
CO3	Students will be able to explain the fundamentals and analyse three phase AC circuits.
CO4	Students will be able to explain the basic operation and analyse the performance of single-phase transformer.
CO5	Students will be able to explain the construction and basic operation of DC motors and generators

Course Outcomes

Course Code: - FEL105

Course: - Basic Workshop practice-I Lab

CO1	Interpret the drawings for different geometrical tolerances on the given part, use marking tool for marking on given part and develop the necessary skills required to handle/use different fitting tools for different operation (L3)
CO2	Develop skill required for hardware maintenance, develop skill to install and operating system and system drives and develop to identify the network components and perform basic networking crimping. (L3)
CO3	Develop the necessary skill required to handle/ use different plumbing tools. (L1)

Course Outcomes

Course Code: - FEC201

Course: - Engineering Mathematics-II

CO1	Solve various types of First Order differential equation
CO2	Solve various types of Higher Order Differential equation
CO3	Illustrate the concepts of Beta and Gamma function, DUIS and rectification
CO4	Apply the concepts of Double integral
CO5	Apply the concept of Triple integral
CO6	Apply the principles of Numerical Method for solving differential equation and numerical integration analytically and using Scilab also

Course Outcomes

Course Code: - FEC202

Course: - Engineering Physics-II

CO1	Comprehend the concepts of Diffraction of light and its applications.
CO2	Illustrate the principle, construction and working of various lasers & optical fibres and their applications.
CO3	Identify different coordinate systems and use of Maxwell's equations in telecommunication system.
CO4	Differentiate between frames of reference and transformations.
CO5	Comprehend the synthesis, characterization and applications of nanomaterials.
CO6	Identify different sensors in Engineering applications.

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Course Outcomes

Course Code: - FEC203

Course: - Engineering Chemistry-II

CO1	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.
CO2	Illustrate the concept of emission spectroscopy and describe the phenomenon of fluorescence and phosphorescence in relation to it.
CO3	Explain the concept of electrode potential and Nernst theory and relate it to electrochemical cells.
CO4	Identify different types of corrosion and suggest control measures in industries.
CO5	Illustrate the principles of green chemistry and study environment impact.
CO6	Explain the knowledge of determining the quality of fuel and quantify the oxygen required for combustion of fuel.

Course Outcomes

Course Code: - FEC204

Course: - Engineering Graphics

CO1	Apply the basic principles of projections in Projection of Lines and Planes
CO2	Apply the basic principles of projections in Projection of Solids.
CO3	Apply the basic principles of sectional views in Section of solids.
CO4	Apply the basic principles of projections in converting 3D view to 2D drawing.
CO5	Read a given drawing.
CO6	Visualize an object from the given two views.

Course Outcomes

Course Code: - FEC205

Course: - C programming

CO1	Formulate simple algorithms for arithmetic, logical problems and implement them as programs in C language.
CO2	Implement, test and execute programs comprising of control structures.
CO3	Apply the concept of functions and synthesize a complete program.
CO4	Demonstrate the use of arrays and strings in C language.
CO5	Demonstrate the use of structures in C language.
CO6	Apply the concept of pointer implementation in C

Course Outcomes

Course Code: - FEC206

Course: - Professional Communication and Ethics- I

CO1	Eliminate barriers and use verbal/non-verbal cues at social and workplace situations.
CO2	Employ listening strategies to comprehend wide-ranging vocabulary, grammatical structures, tone and pronunciation.
CO3	Prepare effectively for speaking at social, academic and business situations.
CO4	Use reading strategies for faster comprehension, summarization and evaluation of texts.
CO5	Acquire effective writing skills for drafting academic, business and technical documents.
CO6	Successfully interact in all kinds of settings, displaying refined grooming and social skills.

Course Outcomes

Course Code: - FEL201

Course: - Engineering Physics-II Lab

CO1	Perform the experiments based on diffraction through slits using Laser source and analyse the result.
CO2	Perform the experiments using optical fibre to measure its Numerical Aperture and study of data transmission.
CO3	Perform the experiments on various sensors and analyse the result.
CO4	Students will be able to present a working model of a mini project.

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Course Outcomes

Course Code: - FEL202

Course: - Engineering Chemistry-II Lab

CO1	To be able to apply the knowledge of symmetric cryptography to implement simple ciphers.
CO2	To be able to analyse and implement public key algorithms like RSA and El Gamal.
CO3	To analyse and evaluate performance of hashing algorithms.
CO4	To explore the different network reconnaissance tools to gather information about networks.
CO5	To explore and use tools like sniffers, port scanners and other related tools for analysing packets in a network.
CO6	To be able to set up firewalls and intrusion detection systems using open source technologies and to explore email security.
CO7	To be able to explore various attacks like buffer-overflow, and web-application attacks.

Course Outcomes

Course Code: - FEL203

Course: - Engineering Graphics Lab

CO1	Apply basic Principles of projections in projection in 2D drawing using a CAD software
CO2	Create, Annotate, Edit and Plot drawing using basic Auto CAD commands & Features
CO3	Apply the concept of layers to create drawing
CO4	Apply basic Auto CAD skills to draw different view of a 3D objects
CO5	Apply Basic Auto CAD skills to draw the Isometric view from the given two views.

Course Outcomes

Course Code: - FEL204

Course: - C Programming Lab

CO1	Implement given algorithms to a program & Correct syntax and logical errors
CO2	Apply the Concept of looping and Branching Statement programs.
CO3	Apply data in arrays, strings manipulate them through a Program
CO4	Demonstrate the Concept of function in C programming.
CO5	Demonstrate structures and manipulate them through a Program
CO6	Demonstrate the Concept of pointers and implement call by reference concept.

Course Outcomes

Course Code: - FEL205

Course: - Professional Communication and Ethics-I Lab

CO1	Eliminate barriers and use verbal/non-verbal cues at social and workplace situations.
CO2	Employ listening strategies to comprehend wide-ranging vocabulary, grammatical structures, tone and pronunciation.
CO3	Prepare effectively for speaking at social, academic and business situations.
CO4	Use reading strategies for faster comprehension, summarization and evaluation of texts.
CO5	Acquire effective writing skills for drafting academic, business and technical documents.
CO6	Successfully interact in all kinds of settings, displaying refined grooming and social skills.

Course Outcomes

Course Code: - CSC301

Course: - Engineering Mathematics-III

CO 01	Apply the concept of Laplace, inverse Laplace transform and its application to solve the real integrals in engineering problems
CO 02	Apply Fourier series to real-life problems and complex engineering problems.
CO 03	Apply complex variable theory, application of harmonic conjugate to find orthogonal trajectories and analytic functions.
CO 04	Apply the concepts of probability, correlation and regression for getting (to find) the spread of the data and distribution of probabilities

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Course Outcomes

Course Code: - CSC302

Course: - Discrete Structures and Graph Theory

CO 01	Apply logical reasoning and mathematical thinking and proofs in problem solving.
CO 02	Use relations and functions in solving practical problems.
CO 03	Use posets and lattices in solving practical problems.
CO 04	Demonstrate counting principles and solve recurrence relation problems
CO 05	Implement groups and codes in encoding-decoding
CO 06	Apply concepts of graph theory in solving real world problems.

Course Outcomes

Course Code: - CSC303

Course: - Data Structures

CO 01	To implement linear and non-linear data structures.
CO 02	To apply various operations like searching, insertion, deletion and traversals on Stack and Queues.
CO 03	To apply various operations like searching, insertion, deletion and traversals on various Linked Lists.
CO 04	To analyze the tree and graph data structures and apply it to solve problems in various domains.
CO 05	To analyze and implement linear, binary and hashing techniques for a given problem.

Course Outcomes

Course Code: - CSC304

Course: - Digital Logic & Computer Architecture

CO 01	Apply knowledge of different number systems and basic structure of computer system.
CO 02	Implement various arithmetic algorithms.
CO 03	Apply the basic concepts of digital components and processor organization.
CO 04	Apply the basic concepts of science to understand the generation of control signals of computer
CO 05	Demonstrate the memory organization.
CO 06	Examine the concepts of parallel processing and different Buses.

Course Outcomes

Course Code: - CSC305

Course: - Computer Graphics

CO 01	Articulate the basic concepts of Computer Graphics.
CO 02	Demonstrate various algorithms for basic graphics primitives.
CO 03	Apply 2-D geometric transformations on graphical objects.
CO 04	Apply various Clipping algorithms on graphical objects

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CO 05	Explore 3-D geometric transformations, curve representation techniques and projections methods.
CO 06	Examine visible surface detection techniques and Animation.

Course Outcomes

Course Code: - CSL301

Course: - Data Structures Lab

CO 01	Implement linear data structures & be able to handle various operations on them.
CO 02	Implement nonlinear data structures & handle various operations on them along with effective presentation
CO 03	Analyze data structures and apply in various problems.
CO 04	Analyze & Implement searching techniques for given problems.

Course Outcomes

Course Code: - CSL302

Course: - Digital Logic & Computer Architecture -Lab

CO 01	Experiment with basics of digital components
CO 02	Design the basic building blocks of a computer: ALU, registers, CPU and memory
CO 03	Examine the importance of digital systems in computer architecture
CO 04	Implement various algorithms for arithmetic operations. (Team work)

Course Outcomes

Course Code: - CSL303

Course: - Computer Graphics Lab

CO 01	Implement various output and filled area primitive algorithms
CO 02	Apply transformation, projection and clipping algorithms on graphical objects.
CO 03	Perform curve and fractal generation methods.
CO 04	Develop a Graphical application/Animation based on learned concept

Course Outcomes

Course Code: - CSL304

Course: - Skill based Lab Course: Object Oriented Programming with Java

CO 01	Apply the object oriented programming [OOPS] concepts and explore the fundamental java programming constructs like if..else, loops, accepting user input, etc.
CO 02	Illustrate the concept of classes, objects, methods, constructor and packages.
CO 03	Apply the concept of strings, string buffers, arrays, vectors and their methods
CO 04	Implement the OOPs concept of inheritance and its different types for designing reusable and extensible code and the test OOPs concept of Abstraction via Abstract class, Abstract Methods and Interfaces

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CO 05	Design abnormal termination protected codes by Applying the concepts of Exception handling and testing the effect of final keyword on class, method and variable
CO 06	Develop GUI based application with database interaction using Java Swing and JDBC

Course Outcomes

Course Code: - CSM301

Course: - Mini Project -1A

CO 01	Apply Knowledge and skills to solve societal /research needs in a group.
CO 02	Draw the proper inferences from available results through theoretical/ experimental/ simulations.
CO 03	Develop interpersonal skills to work as member or leader of group.
CO 04	Analyze the impact of solution in societal and environmental context for sustainable development.
CO 05	Use standard norms of applicable software engineering practices
CO 06	Demonstrate and excel in written, oral communication and project management skills.

Course Outcomes

Course Code: - CSC 401

Course: - Engineering Mathematics - IV

CO 01	Apply and find (L3) dependent/independent vectors of matrices using the concept of eigenvalues and eigenvectors
CO 02	Evaluate (L3) contour integrals, residues using complex integration
CO 03	Apply (L3) Z- transformation and inverse Z transformation to solve engineering problems
CO 04	Find and apply (L3) types of distribution to test the hypothesis for large and small samples
CO 05	Use (L3) LPP and NLPP methods to solve optimisation problems

Course Outcomes

Course Code: - CSC402

Course: - Analysis of Algorithm

CO 01	Articulate the time and space complexity of algorithms.(L3)
CO 02	Illustrate the complexity of divide and conquer strategy based algorithms.(L4)
CO 03	Calculate time and space complexity of the greedy strategy Based algorithms.(L4)
CO 04	Analyze the complexity of dynamic programming based algorithms.(L4)
CO 05	Distinguish between backtracking, branch and bound approaches.(L4)
CO 06	Reviewing the different string matching techniques.(L3)

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Course Outcomes

Course Code: - CSC403

Course: - Database Management System

CO 01	Summarize the need of database management system
CO 02	Implement ER/EER Diagram for real life applications
CO 03	Illustrate the Relational Model and write relational algebra queries
CO 04	Integrate SQL Queries for the given problem statement
CO 05	Apply the concept of normalization to relational database design
CO 06	Implement the concept of transaction, concurrency and recovery

Course Outcomes

Course Code: - CSC-404

Course: - Operating System

CO 01	Apply the fundamental concept of Operating System [L3]
CO 02	Analyze the concept of process management and evaluate performance of process scheduling algorithms[L4]
CO 03	Apply the concepts of synchronization and deadlocks [L3]
CO 04	Evaluate performance of Memory allocation and replacement policies [L3]
CO 05	Demonstrate the concept of file management [L3]
CO 06	Apply concepts of I/O management and analyze techniques of disk scheduling. [L3]

Course Outcomes

Course Code: - CSC405

Course: - Microprocessor

CO 01	Summarizing fundamental concepts of 8086 microprocessor {L2}
CO 02	Interpret instruction set and assembly language programming [L3]
CO 03	Design 8086-microprocessor system with its Peripherals and Memory interfacing techniques. [L4]
CO 04	Examining the Architecture of 80386 microprocessor [L3]
CO 05	Distiughing Pentium Processor with 8086
CO 06	Illustating Pentium 4 and its Merits

Course Outcomes

Course Code: - CSL401

Course: - Analysis of Algorithm Lab

CO 01	Compare and contrast different sorting algorithms.(L2)
CO 02	Implementation of Divide & Conquer algorithms.(L3)
CO 03	Analyse Greedy approach based algorithms with real world applications.(L4)

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CO 04	Illustrate Dynamic programming algorithms with its merits and demerits.(L4)
CO 05	Distinguish Backtracking & Branch-Bound algorithms for given application.(L4)
CO 06	Debating different algorithms for a specific problem domain.(L5)

Course Outcomes

Course Code: - CSL402

Course: - Database Management System Lab

CO 01	Design ER/EER Diagram and convert to relational model for the real-world application
CO 02	Apply DDL, DML, DCL and TCL Commands
CO 03	Formulate simple and complex queries
CO 04	Execute PL/SQL Constructs
CO05	Demonstrate the concept of transactions execution and frontend-backend connectivity

Course Outcomes

Course Code: - CSL 403

Course: - Operating System Lab

CO 01	Implement basic Operating system Commands, Shell scripts, System Calls and API wrt Linux. [L3]
CO 02	Implement various process scheduling algorithms and evaluate their performance. [L3]
CO 03	Analyze concepts of synchronization and deadlocks [L4]
CO 04	Implement concepts of virtual memory and evaluate performance of various Memory Management techniques. [L3]
CO 05	Implement and analyze concepts of file management and I/O management techniques. [L3]
CO 06	Explore and Present different types of Operating Systems in group (team). [L3]

Course Outcomes

Course Code: - CSC405

Course: - Microprocessor Lab

CO 01	Use appropriate instructions to program microprocessor to perform various task.
CO 02	Develop the program in assembly / mixed language for intel 8086 microprocessor.
CO 03	Demonstrate the execution and debugging of interrupts using 8086 assembly program.
CO 04	Design 8086 based system using memory and peripheral chips.

Course Outcomes

Course Code: - CSL405

Course: - Skill base Lab Course: - Python Programming

CO 01	Implement basic concepts of python. (L3)
CO 02	Implement advanced concepts of python. (L3)
CO 03	Explore Django web framework for developing python-based web application. (L3)

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CO 04	Analyze the data using NumPy and Pandas libraries. (L4)
CO 05	Communicate and Present the solution effectively. (L3)
CO 06	Analyze and Design solution for given problem. (L3)

Course Outcomes

Course Code: - CSM401

Course: - Mini Project 1-B

CO 01	Apply Knowledge and skills to solve societal /research needs in a group.
CO 02	Draw the proper inferences from available results through theoretical/ experimental/ simulations.
CO 03	Develop interpersonal skills to work as member or leader of group.
CO 04	Analyze the impact of solution in societal and environmental context for sustainable development.
CO 05	Use standard norms of applicable software engineering practices
CO 06	Demonstrate and excel in written, oral communication and project management skills.

Course Outcomes

Course Code: - CSC503

Course: - Computer Networks

CO 01	Demonstrate the concepts of data communication at physical layer and compare ISO - OSI model with TCP/IP model
CO 02	Explore different design issues at data link layer.
CO 03	Design the network using IP addressing and sub netting / supernetting schemes.
CO 04	Analyze transport layer protocols and congestion control algorithms.
CO 05	Explore protocols at application layer

Course Outcomes

Course Code: - CSL502

Course: - Computer Network Lab

CO 01	Design and setup networking environment in Linux.
CO 02	Explore networking algorithms and protocols and Use Network tools and simulators such as NS2, Packet tracer, Wireshark etc
CO 03	Implement programs using core programming APIs for understanding networking concepts.
CO 04	Explore and Present various real time network applications in group (team).

Course Outcomes

Course Code: - CSDL05012

Course: - Internet Programming (DLOC-I)

CO 01	Implement interactive web page(s) using HTML and CSS.
CO 02	Design a responsive web site using JavaScript
CO 03	Implement interactive web page(s) using JSP and JDBC.

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CO 04	Design UI using AJAX and jQuery
CO 05	Apply various Web Extensions and develop website using PHP and MySQL
CO 06	Demonstrate web application using React JS

Course Outcomes

Course Code: - CSC504

Course: - Database Warehouse & Mining

CO 01	Design data warehouse and perform various OLAP operations.
CO 02	Implement data mining algorithms like classification.
CO 03	Implement clustering algorithms on a given set of data sample.
CO 04	Implement Association rule mining & web mining algorithm.
CO 05	Present a solution for the given problem

Course Outcomes

Course Code: - CSC504

Course: - Database Warehouse & Mining Lab

CO 01	Design data warehouse with dimensional modelling and apply OLAP operations.
CO 02	Explore data mining principles and perform Data preprocessing and Visualization.
CO 03	Apply appropriate data mining algorithms to solve real world problems.
CO 04	Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining
CO 05	Compose complex information and social networks with respect to web mining.

Course Outcomes

Course Code: - CSL504

Course: - Professional Comm. & Ethics II

CO 01	Plan and prepare effective business/ technical documents which will in turn provide solid foundation for their future managerial roles.
CO 02	Strategize their personal and professional skills to build a professional image and meet the demands of the industry.
CO 03	Emerge successful in group discussions, meetings and result-oriented agreeable solutions in group communication situations.
CO 04	Deliver persuasive and professional presentations.
CO 05	Develop creative thinking and interpersonal skills required for effective professional
CO 06	Apply codes of ethical conduct, personal integrity and norms of organizational behaviour.

Course Outcomes

Course Code: - CSC502

Course: - Software Engineering

CO 01	To Assess the process models for software development.
CO 02	To Analyse the requirements & develop the model.
CO 03	To Calculate the cost and schedule and track the progress of the projects
CO 04	To Design the software projects.

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CO 05	To Carry out the testing of software projects
CO 06	Manage risks and change to assure quality in software projects.

Course Outcomes

Course Code: - CSL501

Course: - Software Engineering Lab

CO 01	Identify requirements and apply software process model to selected case study
CO 02	Develop software models using computer-aided software engineering (CASE) tools.
CO 03	Estimate and schedule the project using computer-aided software engineering (CASE) tools.
CO 04	Develop test cases, RMMM plan and different versions of software using modern SCM tool
CO 05	Acquire knowledge to present a software design

Course Outcomes

Course Code: - CSC501

Course: - Theoretical Computer Science

CO 01	Discuss concepts of Theoretical Computer Science, difference and equivalence of DFA and NFA , languages described by finite automata and regular expressions
CO 02	Devise Context free grammer to recognize the language
CO 03	Design pushdown automata to recognize the language
CO 04	Develop an understanding of computation through Turing Machine
CO 05	Acquire fundamental understanding of decidability and undecidability

Course Outcomes

Course Code: - CSC604

Course: - Artificial Intelligence

CO 01	Apply basic understanding of AI building blocks to create AI agent (L3)
CO 02	Analyze State-art-existing problems and Apply proper solutions to given problem domain (L4)
CO 03	Analyze the strength and weaknesses of AI approaches to knowledge– intensive problem solving (L4)
CO 04	Evaluate models for reasoning with uncertainty as well as the use of unreliable information (L5)
CO 05	Explore AI applications in real world scenarios (L4)

Course Outcomes

Course Code: - CSL604

Course: - Artificial Intelligence Lab

CO 01	Construct the problem statement and PEAS description (L3)
CO 02	Illustrate uninformed and informed searching techniques for real world problems (L3)
CO 03	Explore a knowledge base using any AI language (L4)
CO 04	Validating expert systems for real world problems (L4)
CO 05	Reviewing and presenting the given solution effectively (L5)

Course Outcomes

Course Code: - CSC602

Course: - Cryptography & System Security

CO 01	Explore system security goals and concepts, classical encryption techniques and acquire fundamental knowledge on the concepts of modular arithmetic and number theory. (L4)
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CO 02	Distinguish different encryption and decryption techniques to solve problems related to confidentiality and authentication. (L4)
CO 03	Apply different message digest and digital signature algorithms to verify integrity and achieve authentication and design secure applications. (L3)
CO 04	Analyse different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP and Understand network security basics. (L4)
CO 05	Apply system security concept to recognize malicious code. (L3)

Course Outcomes

Course Code: - CSL602

Course: - Cryptography & System Security Lab

CO 01	Apply the knowledge of symmetric and asymmetric cryptography to implement simple ciphers. (L3)
CO 02	Explore the different network reconnaissance tools to gather information about networks. (L4)
CO 03	Explore tools for sniffing and port scanning such as Wireshark, Nmap and other related tools for analysing packets in a Network. (L4)
CO 04	Examine email security and configure firewalls and intrusion detection systems using open-source technologies. (L3)
CO 05	Articulate various attacks like buffer-overflow and web application attack. (L3)

Course Outcomes

Course Code: - HAIMLC601

Course: - GAME THEORY USING AI &ML

CO 01	Understand basic concept of game theory.
CO 02	Evaluate Artificial Intelligence (AI) methods and describe their foundations
CO 03	Analyze and illustrate how search algorithms play vital role in problem solving, inference, perception, knowledge representation and learning
CO 04	Demonstrate knowledge of reasoning and knowledge representation for solving real world problems
CO 05	Recognize the characteristics of machine learning that makes it useful to realworld problems and apply different dimensionality reduction techniques
CO 06	Apply the different supervised learning methods of support vector machine and tree based models

Course Outcomes

Course Code: - CSC603

Course: - Mobile Computing

CO 01	Articulate basic concepts and principles in mobile computing and cellular architecture.(L3)
CO 02	Explore the components and functionalities of mobile networking techniques(L3)
CO 03	Explore components of GSM,GPRS system and Categorize variety of security techniques in mobile network.(L3)
CO 04	Apply the concepts of WLAN for local as well as remote applications.(L3)
CO 05	Explore the Long Term Evolution (LTE) architecture and its interfaces.(L3)
CO 06	Apply the concept of Mobility management and distinguish between different type of mobility(L3)

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Course Outcomes

Course Code: - CSL603

Course: - Mobile Computing Lab

CO 01	Develop and demonstrate mobile applications using various tools(L3)
CO 02	Articulate the knowledge of GSM, CDMA & Bluetooth technologies and demonstrate it.(L3)
CO 03	Implement security algorithms for mobile communication network(L3)
CO 04	Explore and Present various real time mobile network applications in group (team).(L4)

Course Outcomes

Course Code: - CSDLO6013

Course: - Quantitative Analysis (DLOC- 02)

CO 01	Summarizing the importance of Statistics and Quantitative Analysis . (L2)
CO 02	Articulate different data collection and the sampling methods. (L3)
CO 03	Analyze using concepts of Regression, Multiple Linear Regression for specific application domain.(L4)
CO 04	Compare different Statistical inference drawing methods for particular application domain.(L2)
CO 05	Reviewing testing of ANOVA hypotheses with different example. (L5)

Course Outcomes

Course Code: - CSL605

Course: - Skill Base Lab Course: Cloud Computing

CO 01	Examine the inception, services, pricing plans and global outreach of any leading Cloud Service Provider and apply different virtualization techniques for efficient resource utilization using hosted hypervisors.(L3)
CO 02	Illustrate the functioning of the IAAS (AWS EC2) cloud computing service models by designing applications for solving the given problem statement using AWS/Microsoft Azure cloud platform (L4)
CO 03	Explore the security issues in cloud and devise mechanisms to address them using Security as a Service model through AWS Identity and Access Management (AWS IAM) for managing the access to the cloud services (L4)
CO 04	Implement the cloud computing service models of STaaS using AWS S3 to solve the given problem statement using AWS cloud platform (L3)
CO 05	Implement the cloud computing service model of DBaaS using AWS RDS to solve the given problem statement using AWS cloud platform (L3)
CO 06	Implement and Communicate a cloud based solution for a real world problem statement by working in a group (L3)

Course Outcomes

Course Code: - CSC601

Course: - System Programming
& Compiler Construction

CO 01	Articulate the relevance of different system programs. (L3)
CO 02	Execution of various data structures used for assembler and macroprocessor. (L3)
CO 03	Distinguish between different loaders and linkers and their contribution in developing efficient user applications. (L4)
CO 04	Analysis of fundamentals of compiler design and their relationships among different phases of the compiler. (L4)
CO 05	Examining of code optimization and code generation.(L3)



Course Outcomes

Course Code: - CSL601

Course: - System Programming
& Compiler Construction Lab

CO 01	Implement two pass assemblers and macro processor. (L3)
CO 02	Examine the given input string by constructing Top down/Bottom-up parser. (L3)
CO 03	Examine the tokens for given high level language and Implement synthesis phase of compiler. (L3)
CO 04	Distinguish LEX & YACC tools. (L4)

Course Outcomes

Course Code: - CSC702

Course: - Big Data Analytics

CO 01	Discuss the key issues in big data management and its associated applications for business decisions and strategy.
CO 02	Apply fundamental enabling techniques like Hadoop and MapReduce in solving real world problems.
CO 03	Develop problem solving and critical thinking skills in fundamental enabling techniques like NoSQL in big data analytics.
CO 04	Apply advanced techniques for emerging applications like stream analytics.
CO 05	Apply adequate perspectives of big data analytics in various applications like recommender systems, social media applications, etc.
CO 06	Apply statistical computing techniques and graphics for analyzing big data.

Course Outcomes

Course Code: - CSL702

Course: - Big Data Analytics Lab

CO 01	Explore Hadoop Ecosystem, its core components and manage Hadoop's file System using HDFS commands
CO 02	To implement algorithms that uses Map Reduce for applying on structured and unstructured data
CO 03	To perform CRUD operations on any NoSql databases such as Cassandra, HadoopHbase, MongoDB, etc.
CO 04	To implement various data streams algorithms.
CO 05	To develop and analyze the social network graphs with data visualization techniques.
CO 06	Explore and Present various real life large data application to be implemented using standard Datasets available on the web in a group. (Mini Project)

Course Outcomes

Course Code: - CSDC7013

Course: - Natural Language Processing (DLOC-03)

CO 01	Demonstrate the capabilities and limitations of current tools and technologies in the field of natural language processing
CO 02	Illustrate a language model with formal grammars to perform morphological analysis of words and perform evaluation of N-grams
CO 03	Perform part of speech tagging and parse tree generation for syntactical analysis of sentences using suitable algorithms and statistical techniques in computational linguistics.
CO 04	Analyze the relations among lexemes and their senses and perform semantic analysis using associated algorithms
CO 05	Demonstrate the concept of pragmatic analysis by reference resolution using Hobbs and Centering algorithm



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CO 06	Design an NLP applications such as machine translation, text categorization, text summarization, information extraction using suitable NLP techniques
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Course Outcomes

Course Code: - CSDL7013

Course: - Natural Language Processing Lab (DLOC-03)

CO 01	Apply different types of text preprocessing techniques on a sample text and explore Python libraries like NLTK ,RE, Spacy, Indic NLP, etc.
CO 02	Perform morphological Analysis by Designing a Morphological Analyzer and Build a predictor of next words in a given text using N-gram model.
CO 03	Classify the words in the given text into suitable parts of speech category using POS tagging technique followed by Applying chunking technique on the words to group them into meaningful phrases
CO 04	Distinguish the named entities in text using Named Entity Recognition technique and perform Exploratory data analysis of a given text using Word Cloud
CO 05	Implement Text Similarity Recognizer for 2 text documents
CO 06	Develop an NLP application using suitable natural language processing techniques and communicate proper experimental methodology for its design

Course Outcomes

Course Code: - CSDC7023

Course: - Information Retrieval (DLOC-04)

CO 01	Apply the concepts of the Information retrieval system in different areas.
CO 02	Design the various modeling techniques for information retrieval systems.
CO 03	Implement the query structure and various query operations
CO 04	Analyzing the indexing and scoring operations in information retrieval system
CO 05	Evaluate information retrieval systems
CO 06	Analyze various information retrieval systems for real world application

Course Outcomes

Course Code: - CSDL7023

Course: - Information Retrieval Lab (DLOC-04)

CO 01	Analyze the Query Structure for Information Retrieval
CO 02	Implement different modeling techniques for information retrieval
CO 03	Implement the frame queries for information retrieval
CO 04	Perform the query expansion techniques
CO 05	Demonstrate evaluation techniques for Information retrieval

Course Outcomes

Course Code: - HAIMLC701

Course: - AI&ML in Healthcare

CO 01	Understand the role of AI and ML for handling Healthcare data.
CO 02	Apply Advanced AI algorithms for Healthcare Problems.
CO 03	Learn and Apply various Computational Intelligence techniques for Healthcare Application.
CO 04	Use evaluation metrics for evaluating healthcare systems.
CO 05	Develop NLP applications for healthcare using various NLP Techniques..

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CO 06	Apply AI and ML algorithms for building Healthcare Applications
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Course Outcomes

Course Code: - HAIMLSBL701

Course: - AI&ML in Healthcare Lab

CO 01	Students will be able to understand computational models of AI and ML.
CO 02	Students will be able to develop healthcare applications using appropriate computational tools.
CO 03	Students will be able to apply appropriate models to solve specific healthcare problems.
CO 04	Students will be able to analyze and justify the performance of specific models as applied to healthcare problems.
CO 05	Students will be able to design and implement AI and ML-based healthcare applications.

Course Outcomes

Course Code: - ILOC7013

Course: - Management Information System (ILOC-01)

CO 01	Explore CBIS and its impact on organisations & significance on society.
CO 02	Evaluate the benefits and limitations of BI & various Data Knowledge management systems
CO 03	Explore ethical issues & privacy for Information Security
CO 04	Explore technologies for accessing information from databases to improve business performance and decision making
CO 05	Illustrate various computer networking techniques with modern extension of pervasive & cloud computing.

Course Outcomes

Course Code: - CSL701

Course: - Machine Learning Lab

CO 01	Implement an appropriate machine learning model for the given application
CO 02	Implement ensemble techniques to combine predictions from different models
CO 03	Implement the dimensionality reduction techniques
CO 04	Communicate and present a solution for the given problem

Course Outcomes

Course Code: - CSC701

Course: - Machine Learning

CO 01	Acquire fundamental knowledge of developing machine learning models
CO 02	Apply an appropriate machine learning model for the given problem
CO 03	Evaluate an appropriate machine learning model for the given problem
CO 04	Demonstrate ensemble techniques to combine predictions from different models
CO 05	Demonstrate the dimensionality reduction techniques

Course Outcomes

Course Code: - CSP701

Course: - Major Project 1

CO 01	Apply Knowledge and skills to solve societal /research needs in a group.
CO 02	Draw the proper inferences from available results through theoretical/ experimental/ simulations.
CO 03	Develop interpersonal skills to work as member or leader of group.
CO 04	Analyze the impact of solution in societal and environmental context for sustainable development.
CO 05	Develop a solution using norms of applicable software engineering practices and demonstrate excel in written, oral communication and project management skills.



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CO 06	Combine different skills like critical thinking, problem solving approach, ethical practice and team work which will lead to life long learning.
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Course Outcomes

Course Code: - CSC801

Course: - Distributed Computing

CO 01	Articulate the knowledge of the basic elements and concepts related to distributed system technologies;
CO 02	Determine the middleware technologies that support distributed applications such as RPC, RMI and Object based middleware.
CO 03	Analyze and contrast the various techniques used for clock synchronization, mutual exclusion and deadlock.
CO 04	Illustrate the concepts of Resource and Process management.
CO 05	Distinguish the concepts of Consistency, Replication Management and fault Tolerance.
CO 06	Examine the knowledge of Distributed File systems in building large-scale distributed applications.

Course Outcomes

Course Code: - CSL801

Course: - Distributed Computing Lab

CO 01	Examine and debug using Message-Oriented Communication or RPC/RMI based client-server programs
CO 02	Implement techniques for clock synchronization.
CO 03	Choose techniques for Election Algorithms.
CO 04	Analyze mutual exclusion algorithms and deadlock handling.
CO 05	Assess techniques of resource and process management.
CO 06	Review the concepts of distributed File Systems with some case studies.

Course Outcomes

Course Code: - CSDC8011

Course: - Deep Learning (DLOC-05)

CO 01	Explore python libraries for Deep Learning
CO 02	Implementation of DNN to solve real world problems
CO 03	Implementation of Autoencoder architecture for Image segmentation
CO 04	Design of CNN architecture for healthcare applications
CO 05	Comparing of RNN architecture for NLP applications
CO 06	Presentation of Generative AI Models for various applications

Course Outcomes

Course Code: - CSDL8011

Course: - Deep Learning Lab (DLOC-05)

CO 01	Interpretation of basic concept of deep learning [L2]
CO 02	Implementation of DNN with any one Optimization Algorithm(L3)
CO 03	Implementation of Autoencoder architecture for Image segmentation(L3)

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CO 04	Testing of CNN architecture for object detection applications(L4)
CO 05	Reviewing of RNN architecture for NLP applications(L3)
CO 06	Presenting modern deep leaning with Industrial applications (L2)

Course Outcomes

Course Code: - CSDC8023

Course: - Social Media Analytics (DLOC-06)

CO 01	Apply the concept of Social media Analytics to realworld problems (L3)
CO 02	Illustrate social network structures of a Realworld Applications (L3)
CO 03	Analyze social media text , actions and hyperlink of realworld Applications (L3)
CO 04	Implement different Social media analytics tools effectively and efficiently. (L3)
CO 05	Determining different risks present in social media analytics.(L3)
CO 06	Presentation on privacy aspects of social media and hands-on skills needed to work with social media data. (L3)

Course Outcomes

Course Code: - CSDC8023

Course: - Social Media Analytics Lab (DLOC-06)

CO 01	Apply characteristics and types of social media networks.
CO 02	Implement social media analytics tools for business
CO 03	Implement, monitor , store and track social media data
CO 04	Analyze and visualize social media data from multiple platforms
CO 05	Design and Implement content and structure based social media analytics models.
CO 06	Design and implement social media analytics applications for business.

Course Outcomes

Course Code: - ILO8023

Course: - Entrepreneurship Development and Management (ILOC-02)

CO 01	Analyse the concept of business plan (L4)
CO 02	Examining the concept of entrepreneurship capital and Women Entrepreneurs (L3)
CO 03	Interpret key regulations and legal aspects of entrepreneurship in India (L4)
CO 04	Analyse effective business management (L4)
CO 05	Judging the success of small businesses (L3)

Course Outcomes

Course Code: - CSP801

Course: - Major Project 2

CO 01	Apply Knowledge and skills to solve societal /research needs in a group.
CO 02	Draw the proper inferences from available results through theoretical/ experimental/ simulations.

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CO 03	Develop interpersonal skills to work as member or leader of group.
CO 04	Analyze the impact of solution in societal and environmental context for sustainable development.
CO 05	Develop a solution using norms of applicable software engineering practices and demonstrate excel in written, oral communication and project management skills.
CO 06	Combine different skills like critical thinking, problem solving approach, ethical practice and team work which will lead to life long learning.

Course Outcomes

Course Code: - HAIMLC801

Course: - Text, Web and Social Media Analytics

CO 01	Extract Information from the text and perform data pre-processing
CO 02	Apply clustering and classification algorithms on textual data and perform prediction.
CO 03	Apply various web mining techniques to perform mining, searching and spamming of web data.
CO 04	Provide solutions to the emerging problems with social media using behaviour analytics and Recommendation systems.
CO 05	Apply machine learning techniques to perform Sentiment Analysis on data from social media.

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