JIS College of Engineering
Department of Computer Science & Engineering

Vision

The Computer Science and Engineering Department at JIS College of Engineering will be a leader in computing innovation through excellence in undergraduate and graduate education, active research programmes and the dissemination of knowledge. The Department will leverage both the international and interdisciplinary nature of computing.

Mission

The Department's mission is to

(i) Provide students and faculty members with an open environment that encourage professional and personal growth.
(ii) Prepare students for flexible career paths and continuing advancement in computing through its academic programs.
(iii) Motivate and encourage the students to build a successful career in the computing professions through flexible programs of study that can be adapted to support individual career goals.

Programme Educational Objectives (PEOs)

PEO 1: Graduates will be engineering practitioners and leaders, who would assist to resolve industry's technological problems.

PEO 2: Graduates will be engineering professionals, innovators or entrepreneurs engaged in technology development, technology deployment, or engineering system implementation in industry and research institute.

PEO 3: Graduates will interact with their peers in other disciplines in industry and society and contribute to social awareness and the economic growth of the country.

PEO 4: Graduates will be successful in pursuing higher studies in engineering or management and will pursue career paths in teaching or research.

Programme Outcomes (POs)

PO 1: Apply knowledge of mathematics, science, engineering fundamentals in engineering specialization to get the solution of complex engineering problems.

PO 2: Identify, formulate, research literature, and analyse complex engineering problems and formulate it to the substantiated conclusions of mathematics, natural sciences and engineering sciences.

PO 3: Design solutions for complex engineering problems to meet the specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO 4: Use the research-based knowledge and methodologies for interpretation of data and synthesis of information to provide valid conclusions.

PO 5: Use the appropriate techniques, resources and modern engineering and IT tools to predict and model the complex engineering activities with an understanding of the limitations.

PO 6: Apply contextual knowledge reasoning to assess societal, health, safety, legal and cultural issues towards consequent responsibilities relevant to professional engineering practice.

PO 7: Apply the engineering solutions in societal and environmental contexts and demonstrate knowledge for sustainable development.

PO 8: Apply ethical principles to commit the professional ethics, responsibilities, and norms for engineering practice.

PO 9: Effectively function as an individual, a member and leader in diverse group in multidisciplinary areas.

PO 10: Effectively communicate on complex engineering activities with the engineering community for effective reports and design documentation to make effective presentations and give and receive clear instructions.

PO 11: Use engineering and management principles to manage projects and in multidisciplinary environment as a member and leader of a team.

PO 12: Self-learner and clearly understand the value of lifelong learning.

Program Specific Outcomes (PSOs)

A graduate of the Computer Science and Engineering Program will demonstrate:

PSO1: The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.

PSO2: The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.

PSO3: The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies and research.

Semester wise COs
Department of Computer Science & Engineering

1st Semester

M 101: MATHEMATICS-I

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Recall the distinctive characteristics of matrix algebra and calculus.

CO2: Demonstrate the theoretical working of matrix algebra and calculus.

CO3: Apply the principles of matrix algebra and calculus to address problems in their disciplines.

CO4: Examine the nature of system using the concept of matrix algebra and calculus.

PH 101: PHYSICS –I

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Describe various types mechanical resonance and its electrical equivalence

CO2: Explain basic principles of Laser, Optical fibers and various types of semiconductors

CO3: Apply superposition to explain interference and diffraction as well as apply wave mechanics to attainment of Heisenberg's uncertainty principle

CO4: Analyze importance of light as a carrier of information and examine different crystallographic structures according to their co-ordination number and packing factors

CO5: Justify the need of a quantum mechanics as remedy to overcome limitations imposed by classical physics

EC101: BASIC ELECTRONICS ENGINEERING

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Describe the fundamentals of Semiconductors

CO2: Explain V-I characteristics of P-N Junction Diode, zener diode, working of diode rectifier, clipper, clamper, and regulator circuit

CO3: Analyze characteristics of Bipolar junction transistor (BJT) under CE, CB, CC mode of operation and it's biasing therein

CO4: Illustrate the operations of JFET, MOSFET and the CS, CD, CG configuration using JFET

CO5: Determine parameters due to effect of feedback in amplifier

CO6: Construct inverting amplifier circuit, non-inverting amplifier circuit, adder circuit, integrator and differentiator circuit using Operational Amplifier IC

HU101: ENGLISH

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Employ communication in a globalized workplace scenario.

CO2: Demonstrate and apply functional grammar, reading skills and sub-skills.

CO3: Acquire a working knowledge of writing strategies, formats and templates of professional writing.

CO4: Apply and make use of the modalities of intercultural communication.

PH 191: PHYSICS I LAB

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Demonstrate experiments allied to their theoretical concepts

CO2: Conduct experiments using LASER, Optical fiber, Torsional pendulum, Spectrometer

CO3: Participate as an individual, and as a member or leader in groups in laboratory sessions actively

CO4: Analyze experimental data from graphical representations, and to communicate effectively them in Laboratory reports including innovative experiments

EC 191: BASIC ELECTRONICS ENGINEERING LAB
COURSE OUTCOMES:
After completion of this course students will be able to
CO1: Demonstrate Electronic components such as Resistors, Capacitors, Diodes, Transistors measuring equipment like DC power supply, Multimeter, CRO, Signal generator, DC power supply.
CO2: Analyze the characteristics of Junction Diode, Zener Diode, BJT & FET and different types of Rectifier Circuits.
CO3: Determination of input-offset voltage, input bias current and Slew rate, Common- mode Rejection ratio, Bandwidth and Off-set null of OPAMPs.
CO4: Demonstrate the application of Diode, BJT & OPAMP.
ME 192: WORKSHOP/MANUFACTURING PRACTICES
COURSE OUTCOMES:
After completion of this course students will be able to
CO1: Fabricate components with their own hands.
CO2: Get practical knowledge of the dimensional accuracies and tolerances applicable for different manufacturing processes.
CO3: Produce small devices of their interest for project or research purpose.

2nd Semester

M 201: MATHEMATICS - II
COURSE OUTCOMES:
After completion of this course students will be able to
CO1: Use mathematical tools to evaluate multiple integrals and vector integrals
CO2: Apply effective mathematical tools for the solutions of ordinary differential equations that model physical processes.
CO3: Recall the properties of Laplace Transform to evaluate multiple integrals and their usage
CO4: Demonstrate the concept of Laplace transform to solve ordinary differential equations.
CH201: CHEMISTRY
COURSE OUTCOMES:
After completion of this course students will be able to
CO1: Describe the fundamental properties of atoms & molecules, atomic structure and the periodicity of elements in the periodic table
CO2: Apply fundamental concepts of thermodynamics in different engineering applications.
CO3: Apply the knowledge of water quality parameters, corrosion control & polymers to different industries.
CO4: Determine the structure of organic molecules using different spectroscopic techniques.
CO5: Evaluate theoretical and practical aspects relating to the transfer of the production of chemical products from laboratories to the industrial scale, in accordance with environmental considerations.
EE201: BASIC ELECTRICAL ENGINEERING
COURSE OUTCOMES:
After completion of this course students will be able to
CO1: Demonstrate Basic Electrical circuits, Power distribution and Safety measures.
CO2: Analyze an apply DC network theorems.
CO3: Analyze and apply concept of AC circuits of single-phase and three-phase.
CO4: Analyze and apply concepts of AC fundamentals in solving AC network problems.
CO5: Demonstrate basic principles of Transformers and Rotating Machines.

CS 201: PROGRAMMING FOR PROBLEM SOLVING

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Differentiate among different programming languages for problem solving.

CO2: Describe the way of execution and debug programs in C language.

CO3: Define, select, and compare data types, loops, functions to solve mathematical and scientific problem.

CO4: Demonstrate the dynamic behaviour of memory by the use of pointers.

CO5: Design and develop modular programs using control structure, selection structure and file.

ME 201: ENGINEERING MECHANICS

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Demonstrate representation of force, moments for drawing free-body diagrams and analyze friction-based systems in static condition

CO2: Locate the centroid of an area and calculate the moment of inertia of a section.

CO3: Apply of conservation of momentum & energy principle for particle dynamics and rigid body kinetics

CO4: Demonstrate and apply the concept of virtual work, rigid body dynamics and systems under vibration.

CS291: PROGRAMMING FOR PROBLEM SOLVING LAB

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Learn the concept of DOS system commands and editor.

CO2: Formulate the algorithms for simple problems and to translate given algorithms to a working and correct program.

CO3: Identify and correct syntax errors / logical errors as reported during compilation time and run time.

CO4: Write iterative as well as recursive programs.

CO5: Demonstrate the concept of programs with Arrays, Pointers, Structures, Union and Files.

CH 291: CHEMISTRY LAB

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Operate different types of instruments for estimation of small quantities chemicals used in industries and scientific and technical fields.

CO2: Analyze and determine the composition of liquid and solid samples working as an individual and also as a team member

CO3: Analyze different parameters of water considering environmental issues

CO4: Synthesize drug and polymer materials.

CO5: Design innovative experiments applying the fundamentals of chemistry

EE291: BASIC ELECTRICAL ENGINEERING LABORATORY

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Identify and use common electrical components.

CO2: Develop electrical networks by physical connection of various components and analyze the circuit behaviour.

CO3: Apply and analyze the basic characteristics of transformers and electrical machines.

ME 291: ENGINEERING GRAPHICS & DESIGN

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Get introduced with Engineering Graphics and visual aspects of design.

CO2: Demonstrate and use common drafting tools with the knowledge of drafting standards.

CO3: Apply computer aided drafting techniques to represent line, surface or solid models in different Engineering viewpoints.

CO4: Produce part models; carry out assembly operation and show working procedure of a designed project work using animation.

HU 291: LANG. LAB. AND SEMINAR PRESENTATION
COURSE OUTCOMES:
After completion of this course students will be able to
CO1: Demonstrate advanced skills of Technical Communication in English through Language Laboratory.
CO2: Apply listening, speaking, reading and writing skills in societal and professional life.
CO3: Demonstrate the skills necessary to be a competent Interpersonal communicator.
CO4: Analyze communication behaviour.
CO5: Adapt to multifarious socio-economical and professional arenas with the help of effective communication and interpersonal skills.

3rd Semester

M(CSE) 301: MATHEMATICS - III
COURSE OUTCOME (COS):
After completion of this course students will be able to
CO1: Recall the distinctive characteristics of probability distribution, algebraic structure, number theory, recurrence relation, propositional logic and graph theory.
CO2: Demonstrate the theoretical working of probability distribution, algebraic structure, number theory, recurrence relation, propositional logic and graph theory.
CO3: Compute the probability of real-world uncertain phenomena by identifying probability distribution that fits the phenomena.
CO4: Formulate different counting problems and solve the recurrence relation using the underlying concept.
CO5: Construct the shortest path and minimal spanning tree from a given graph using the algorithms of graph theory.
PH 301: PHYSICS-II
COURSE OUTCOMES:
After completion of this course students will be able to
CO1: Explain electromagnetic wave propagation using fundamentals of electrostatics, magnetostatics and electromagnetic theory.
CO2: Apply Schrödinger equation in variety of atomic scale problems including nanomaterials.
CO3: Analyze the importance of superposition principle of quantum mechanics in conceptualization of Quantum bits.
CO4: Justify the importance of Fermi energy level in turning electronic properties of various semiconductors
CS301: DIGITAL ELECTRONICS AND COMPUTER ORGANIZATION
COURSE OUTCOME:
After completion of this course students will be able to
CO1: Realize basic gate operations and laws Boolean algebra.
CO2: Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.
CO3: Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.
CO4: Perform different operations with sequential circuits.
CO5: Understand memory and I/O operations.

CS302: DATA STRUCTURES

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Differentiate how the choices of data structure & algorithm methods impact the performance of program.

CO2: Solve problems based upon different data structure & also write programs.

CO3: Identify appropriate data structure & algorithmic methods in solving problem.

CO4: Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing

CO5: Compare and contrast the benefits of dynamic and static data structures implementations.

CS303: CIRCUIT THEORY AND NETWORK

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Explain Kirchhoff's Laws and Networks theorem for simple circuit analyses

CO2: Apply Laplace Transform for steady state and transient analysis

CO3: Analyze the response of Step, Ramp, Impulse, Sinusoidal, Square, Saw tooth signals.

CO4: Explain two port network parameters through solving related numerical problems

CO5: Analyze various types of network topology matrices by using graph theory as applied to electrical network analysis

PH 391: PHYSICS-II LAB

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Demonstrate experiments allied to their theoretical concepts

CO2: Conduct experiments using semiconductors, dielectric and ferroelectrics

CO3: Classify various types of magnetic materials

CO4: Participate as an individual, and as a member or leader in groups in laboratory sessions actively

CO5: Analyze experimental data from graphical representations, and to communicate effectively them in Laboratory reports including innovative experiments

CS391: DIGITAL ELECTRONICS AND COMPUTER ORGANIZATION LAB

COURSE OUTCOME:

After completion of this course students will be able to

CO1: Design basic gate operations.

CO2: Analyze different combinational circuits- adder, subtractor, multiplexer, decoder, encoder etc.

CO3: Develop different sequential circuits-flip flops.

CO4: Understand memory and I/O operations.

CO5: Design RAM architecture.

CS392: DATA STRUCTURES LAB

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Understand appropriate data structure as applied to specified problem definition.

CO2: Apply operations like searching, insertion, deletion, traversing mechanism on various data structures.

CO3: Develop practical knowledge on the applications of data structures.

CO4: Analyze to store, manipulate and arrange data in an efficient manner.

CO5: Implement queue and stack using arrays and linked list. Implementation of queue, binary tree and binary search tree.

CS393: PROGRAMMING WITH C++ LAB
COURSE OUTCOMES:
After completion of this course students will be able to
CO1: Demonstrate a thorough understanding of modular programming by designing programs that requires the use of programmer-defined functions.
CO2: Understanding of arrays by designing and implementing programs that search and sort arrays.
CO3: Understanding of the object-oriented programming concepts of encapsulation, data abstraction and composition by designing and implementing classes including the use of overloaded functions and constructors.
CO4: Apply of the concept of pointers and dynamic memory allocation, the implementation of programmer-defined functions and classes by writing code, performing unit testing and debugging of multiple complex programs.
CO5: Analyze the differences between C and C++ in the areas of strings, pass by reference/passing pointers, and structs by designing and implementing programs that use C strings, C++ strings, C language structs and classes.
MC-381: BEHAVIORAL & INTERPERSONAL SKILLS
COURSE OUTCOMES:
CO1: Handle workplace interpersonal communication in an effective manner.
CO2: Enable students with strong oral and written interpersonal communication skills.
CO3: Prepare students to critically analyze workplace situations and take appropriate decisions.
CO4: Get campus ready through proper behavioural and interpersonal grooming.
CO5: Enhance skill set to design and frame team-based Project Report and Presentation.

4th Semester

M(CSE)401: NUMERICAL METHODS AND STATISTICS
COURSE OUTCOMES:
After completion of this course students will be able to
CO1: Recall the distinctive principles of numerical analysis and the associated error measures.
CO2: Understand the theoretical workings of numerical techniques.
CO3: Apply numerical methods used to obtain approximate solutions to intractable mathematical problems such as interpolation, integration, the solution of linear and nonlinear equations, and the solution of ordinary differential equations.
CO4: Select appropriate numerical methods to apply to various types of problems in engineering and science in consideration of the mathematical operations involved, accuracy requirements, and available computational resources.
CO5: Interpret complex statistical findings using the understanding of inferential statistics.
HU402: ECONOMICS FOR ENGINEERS
COURSE OUTCOME:
After completion of this course students will be able to
CO1: Apply the appropriate engineering economics analysis method(s) for problem solving: present worth, annual cost, rate-of-return, payback, break-even, benefit-cost ratio.
CO2: Evaluate the cost effectiveness of individual engineering projects using the methods learned and draw inferences for the investment decisions.
CO3: Compare the life cycle cost of multiple projects using the methods learned, and make a quantitative decision between alternate facilities and/or systems.
CO4: Evaluate the profit of a firm, carry out the break-even analysis and employ this tool to make production decision.

CS401: COMPUTER ARCHITECTURE

COURSE OUTCOME:

After completion of this course students will be able to

CO1: To implement pipelining concepts and parallelism techniques with a prior knowledge of stored program methods.

CO2: To evaluate the performance of each type of memory in the hierarchy and their mapping techniques.

CO3: To analyze the SIMD and MIMD architecture and their interconnection techniques.

CO4: Identify the role of VLIW Superscalar processor and branch handling techniques for performance improvement.

CS402: DESIGN & ANALYSIS OF ALGORITHM

COURSE OUTCOME:

After completion of this course students will be able to

CO1: To understand the concepts of time and space complexity, worst case, average case and best case complexities and the big-O notation

CO2: To apply design principles and concepts to algorithm design.

CO3: To understand the mathematical foundation in analysis of algorithms.

CO4: To understand different algorithmic design strategies.

CO5: To analyze the efficiency of algorithms using time and space complexity theory.

CS 403: FORMAL LANGUAGE AND AUTOMATA THEORY

COURSE OUTCOME:

After completion of this course students will be able to

CO1: Apply the knowledge of the basics of state machines with or without output and its different classifications

CO2: Implement synchronous sequential circuits as the foundation of a digital system.

CO3: Apply techniques of designing grammars and recognizers for several programming languages.

CO4: Analyze Turing's Hypothesis as a foreword to algorithms.

CO5: Analyze power and limitation of a computer, and take decisions on computability.

M(CSE)491: NUMERICAL METHODS AND STATISTICS (LAB)

COURSE OUTCOME:

After completion of this course students will be able to

CO1: Understand the theoretical workings of numerical techniques with the help of C/ Matlab

CO2: Execute basic command and scripts in a mathematical programming language

CO3: Apply the programming skills to solve the problems using multiple numerical approaches.

CO4: Analyze if the results are reasonable, and then interpret and clearly communicate the results.

CO5: Understand the theoretical workings of numerical techniques with the help of C/ Matlab

CS491: COMPUTER ARCHITECTURE LAB

COURSE OUTCOME:

After completion of this course students will be able to

CO1: Design the basic gates

CO2: Implement the truth table

CO3: Design circuit using Xilinx tools

CO4: Develop and simulate list of combinational and sequential digital circuits using Xilinx –VHDL language

CS492: DESIGN & ANALYSIS OF ALGORITHM LAB

COURSE OUTCOME:

After completion of this course students will be able to

CO1: Develop the correctness and analyze the running time of the basic algorithms for those classic problems in various domains.

CO2: Understand methods for analyzing the efficiency and correctness of algorithms (such as exchange arguments, recurrence, induction, and average case analysis)

CO3: Design algorithms using the dynamic programming, greedy method, Backtracking, Branch and Bound strategy, and recite algorithms that employ this strategy

CO4: Compare, contrast, and choose appropriate algorithmic design techniques to present an algorithm that solves a given problem.

CO5: Identify and analyze criteria and specifications appropriate to new problems.

CS501: COMPUTER GRAPHICS

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Explain the foundations of computer graphics and different display technology and devices.

CO2: Develop the concept of geometric, mathematical and algorithmic approach necessary for programming computer graphics.

CO3: Implement clipping with the comprehension of windows, view-ports in relation to images display on screen.

CO4: Analyze and compare different hidden surface illumination methods and curves design methods.

CS502: OPERATING SYSTEM

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Describe how computing resources (such as CPU, memory and I/O) are managed by the operating system.

CO2: Analyze kernel and user mode in an operating system.

CO3: Solve different CPU scheduling problem to achieve specific scheduling criteria.

CO4: Apply the knowledge of process management, synchronization, deadlock, memory management to solve computer resource related problems.

CS503: DATABASE MANAGEMENT SYSTEM

COURSE OUTCOMES (COS):

After completion of this course students will be able to

CO1: Apply the knowledge of Entity Relationship (E-R) diagram for an application.

CO2: Create a normalized relational database model Analyze real world queries to generate reports from it.

CO3: Determine whether the transaction satisfies the ACID properties.

CO4: Create and maintain the database of an organization.

CS504A: OBJECT ORIENTED PROGRAMMING USING JAVA

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Design the process of interaction between Objects, classes & methods w.r.t. Object Oriented Programming.

CO2: Acquire a basic knowledge of Object Orientation with different properties as well as different features of Java.

CO3: Analyze various activities of different string handling functions with various I/O operations.

CO4: Discuss basic code reusability feature w.r.t. Inheritance, Package and Interface.

CO5: Implement Exception handling, Multithreading and Applet (Web program in java) programming concept in Java.

CS504B: MULTIMEDIA TECHNOLOGY

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Explain different media including optical storage media; representations of different multimedia data and data formats.

CO2: Analyze various compression techniques.

CO3: Evaluate and create various audio and video file formats.

CO4: Apply different coding technique for solving real life multimedia application.

CS 504C: COMMUNICATION ENGINEERING

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Apply the fundamental concepts of engineering principles in design issues in various communication systems.

CO2: Apply the basic concepts for analyzing the modulation techniques including amplitude modulation (AM), frequency modulation (FM) and phase modulation (PM) that are widely used in analogue communication systems in the time and frequency domains.

CO3: Demonstrate the concepts of sampling, Pulse Modulation techniques and their comparison.

CO4: Illustrate various types of coherent and non-coherent digital modulation techniques, analyse immunity parameters and calculate their error probabilities.

CS 505A: OPERATIONS RESEARCH

COURSE OUTCOME

After completion of this course students will be able to

CO1: Recall the distinctive characteristics of different types of decision-making problem to formulate and solve a real-world problem a prototype of mathematical problem.

CO2: Explain the theoretical workings of appropriate decision-making approaches and tools to identify the optimal strategy in competitive world.

CO3: Apply the principles of different Methods/Model of Operations Research to solve practical problems.

CO4: Develop Mathematical model from the description of the real system.

CS505B: COMPUTATIONAL GEOMETRY

COURSE OUTCOME

After completion of this course students will be able to

CO1: Analyze randomized algorithms for small domain problems

CO2: Apply line-point duality to develop efficient algorithms

CO3: Apply geometric techniques to real-world problems in graphics

CO4: Solve linear programs geometrically

CS505C: DISTRIBUTED ALGORITHMS

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Explain basic concept of different models and organizational structure of distributed algorithm. Explain different models of synchronous, asynchronous allocation techniques in the light of implementation in network and memories.

CO2: Analyze basic idealization of synchronous, asynchronous and shared allocation techniques

CO3: Explain the concepts of shared storage, data links and agreement mechanisms along with its failure detection technique for algorithms.

CO4: Develop partial and distributed algorithms in time-based proof of protocols and methods along with its perspective in modern computing era.

CS591: COMPUTER GRAPHICS LAB

COURSE OUTCOMES:

After completion of this course students will be able to

CO1: Draw different Geometric primitives.

CO2: Apply scan line, Boundary fill, Flood fill polygon filling algorithm for real life problems

CO3: Implement basic transformations on objects

CO4: Implement clipping algorithm on lines and polygons

CS 592: OPERATING SYSTEMS LAB

COURSE OUTCOME

After completion of this course students will be able to

CO1: Analyze different aspects of Linux.

CO2: Design different scripts using shell programming.

CO3: Implement process, thread, semaphore concept of operating system.

CO4: Create shared memory with the implementation of reading from, write into shared memory.

CS593: DATABASE MANAGEMENT SYSTEM LAB

COURSE OUTCOME

After completion of this course students will be able to

CO1: Explain the basic concepts regarding database, know about query processing and techniques involved in query optimization and understand the concepts of database transaction and related database facilities including concurrency control, backup and recovery.

CO2: Describe the introductory concepts of some advanced topics in data management like distributed databases, data warehousing, deductive databases and be aware of some advanced databases like partial multimedia and mobile databases.

CO3: Differentiate between DBMS and advanced DBMS and use of advanced database concepts and become proficient in creating database queries

CO4: Analyze database system concepts and apply normalization to the database.

CO5: Apply and create different transaction processing and concurrency control applications.

CS594A: OBJECT ORIENTED PROGRAMMING LAB

COURSE OUTCOMES:

CO1: Create the procedure of communication between Objects, classes & methods.

CO2: Explain the elementary facts of Object Orientation with various characteristics as well as several aspects of Java.

CO3: Analyze distinct features of different string handling functions with various I/O operations.

CO4: Describe simple Code Reusability notion w.r.t. Inheritance, Package and Interface.

CO5: Apply Exception handling, Multithreading and Applet (Web program in java) programming concept in Java.

CS594B: MULTIMEDIA TECHNOLOGY LAB

COURSE OUTCOME

After completion of this course students will be able to

CO1: Describe about various latest interactive multimedia devices, the basic concepts about images and image format.

CO2: Apply and analyze data compression techniques, image compression techniques like JPEG, video compression techniques like MPEG, and the basic concepts about animation.

CO3: Evaluate and develop an interactive multimedia presentation by using multimedia devices and identify theoretical and practical aspects in designing multimedia applications are surrounding the emergence of multimedia technology.

CO4: Analyze the effects of scale and use on both presentation and lower level requirements along with feedback evaluation in response to an objective set of criteria for multimedia design.

CS 594C: COMMUNICATION ENGINEERING LAB

COURSE OUTCOME

After completion of this course students will be able to

CO1: Analyze the concept of analog and digital communication techniques and their applications.

CO2: Demonstrate to the practical methods of the use of generating and demodulating communication signals.

CO3: Distinguish the significance of signal constellation and spectral width.

CO4: Develop insight into the relations between the input and output signals in various stages of a transmitter and a receiver.

MC 501: ENVIRONMENTAL SCIENCE

COURSE OUTCOME

After completion of this course students will be able to

CO1: Explain the natural environment and its relationships with human activities.

CO2: Apply the fundamental knowledge of science and engineering to assess environmental and health risk.

CO3: Develop guidelines and procedures for health and safety issues obeying the environmental laws and regulations.

CO4: Apply skills for scientific problem-solving related to air, water, noise & land pollution.

6th Semester

CS601: COMPUTER NETWORKS

COURSE OUTCOME(S):

After completion of this course students will be able to

CO1: Describe OSI and TCP/IP models.

CO2: Analyze MAC layer protocols and LAN technologies.

CO3: Design applications using internet protocols.

CO4: Implement routing and congestion control algorithms.

CO5: Develop application layer protocols and understand socket programming

CS602: MICROPROCESSORS & MICROCONTROLLERS

COURSE OUTCOME

After completion of this course students will be able to

CO1: Describe the hardware details of 8085 and 8086 microprocessors AND 8051 microcontrollers with the related signals and their implications

CO2: Develop skill in assembly Language programming of 8085

CO3: Explain the concept and techniques of designing and implementing interfacing of microprocessor with memory and peripheral chips involving system design

CO4: Analyze the performance of computers and its architecture to real-life applications

CS603: SOFTWARE ENGINEERING

COURSE OUTCOME

After completion of this course students will be able to

CO1: Analyze elicit and specify software requirements through a productive working relationship with various stakeholders of the project.

CO2: Design applicable solutions in one or more application domains using software engineering approaches that integrates ethical

CO3: Develop the code from the design and effectively apply relevant standards and perform testing

CO4: Identify modern engineering tools necessary for software project management

CS604A: COMPILER DESIGN

COURSE OUTCOME

After completion of this course students will be able to

CO1: Illustrate the basic concept of compilers and discuss on the components as well as the strengths and weaknesses of various phases of designing a compiler.

CO2: Explain the role of finite automata in compiler design.

CO3: Design and analyze algorithms for syntactic or parsing techniques and semantic analysis of the process of designing compilers.

CO4: Formulate the theories of creating simple compilers using C programming languages.

CS604B: COMPUTER VISION

COURSE OUTCOME

After completion of this course students will be able to

CO1: Explain the Image formation process and the 3D vision techniques

CO2: Analyze the image by extracting features from an images

CO3: Develop applications using the Computer Vision Techniques

CO4: Describe the basics of video processing, motion computation and 3D vision and geometry

CS604C: SIMULATION AND MODELING

COURSE OUTCOME

After completion of this course students will be able to

CO1: Explain the issues in Modeling and Simulation and the System Dynamics & Probability concepts in Simulation.

CO2: Solve the Simulation of Queuing Systems

CO3: Analyze the Simulation output.

CO4: Identify the application area of Modeling and Simulation and apply them.

CS605A: PATTERN RECOGNITION

COURSE OUTCOME

After completion of this course students will be able to

CO1: Explain different Pattern classification methods, Dimensionality reduction method.

CO2: Analyze different clustering and classification technique to solve different pattern recognition problem.

CO3: Solve different probabilistic problem, classification, and clustering problem mathematically.

CO4: Implement simple pattern classifiers, classifier combinations.

CO5: Apply pattern recognition techniques to real-world problems such as document analysis etc.

CS605B: DISTRIBUTED OPERATING SYSTEM

COURSE OUTCOME

After completion of this course students will be able to

CO1: Explain the potential benefits of distributed systems and major security issues associated with distributed system.

CO2: Analyze Distributed Computing techniques, Synchronous and Processes and Shared Data access and Files concepts

CO3: Describe Distributed File Systems and Distributed Shared Memory

CO4: Apply standard design principles in the construction of these systems.

CS605C: DISTRIBUTED DATABASE

COURSE OUTCOME(S):

CO1: Describe database management system internals, internal algorithms in detail.

CO2: Identify and be able to use recent and advanced database techniques (e.g. in concurrency control, buffer management, and recovery

CO3: Analyze on configuration issues related to database operation and performance. Identify which parameters are suitable and what are its implications

CO4: Analyze and optimize transactional code, identifying causes of possible anomalies and correct them.

CO5: Explain on optimization issues given a known database workload, by manipulating indexes, choosing more adequate data types, and modifying queries.

CS606A: DATA WAREHOUSING & DATA MINING

COURSE OUTCOME

After completion of this course students will be able to

CO1: Summarize the issues in Data mining.

CO2: Explain and give examples of Data warehousing.

CO3: Solve Business problems and can apply the Data mining in real applications in industry.

CO4: Implement the classical algorithms in data mining and data warehousing.

CS606B: DIGITAL IMAGE PROCESSING

COURSE OUTCOME

After completion of this course students will be able to

CO1: Explain the basic pre-processing techniques in monochrome and color images.

CO2: Develop skill in concepts of image enhancement like linear and nonlinear spatial filters using MATLAB.

CO3: Describe the concept and techniques of simple image processing projects using different methods of restoration.

CO4: Explain the various segmentation algorithms for practical applications.

CO5: Analyze the performance of Lossless and Lossy compression techniques in images.

CS606C: E-COMMERCE AND ERP

COURSE OUTCOME

After completion of this course students will be able to

CO1: Differentiate various types of Ecommerce.

CO2: Describe E-business and its Models.

CO3: Describe Hardware and Software Technologies for Ecommerce.

CO4: Explain the basic concepts of ERP and identify different technologies used in ERP.

CO5: Apply different tools used in ERP.

CS691: COMPUTER NETWORKS LAB

COURSE OUTCOME

After completion of this course students will be able to

CO1: Demonstrate the socket program using TCP & UDP.

CO2: Develop simple applications using TCP & UDP.

CO3: Develop the code for Data link layer protocol simulation.

CO4: Examine the performances of Routing protocol.

CO5: Experiment with congestion control algorithm using network simulator

CS692: MICROPROCESSORS & MICROCONTROLLERS LAB

COURSE OUTCOME

After completion of this course students will be able to

CO1: Apply the fundamentals of assembly level programming of microprocessors and microcontroller

CO2: Work with standard microprocessor real time interfaces including GPIO, serial ports, digital-to-analog converters and analog-to-digital converters.

CO3: Troubleshoot interactions between software and hardware

CO4: Analyze abstract problems and apply a combination of hardware and software to address the problem

CS693: SOFTWARE ENGINEERING LAB

COURSE OUTCOME

After completion of this course students will be able to

CO1: Handle software development models through rational method.

CO2: Prepare SRS document, design document, project management related document.

CO3: Develop function oriented and object-oriented software design using tools like rational rose.

CO4: Apply various testing techniques through test cases.

7th Semester

HU701: VALUES AND ETHICS IN PROFESSION

COURSE OUTCOME:

After completion of this course, students will be able to

CO1: Explain the core values that shape the ethical behaviour of an engineer and Exposed awareness on professional ethics and human values

CO2: Explain the basic perception of profession, professional ethics, various moral issues & uses of ethical theories, various social issues, industrial standards, code of ethics and role of professional ethics in engineering field

CO3: Implement awareness of responsibilities of an engineer for safety and risk benefit analysis, professional rights and responsibilities of an engineer

CO4: Apply ethical principles to resolve situations that arise in their professional lives

CS701A: ARTIFICIAL INTELLIGENCE

COURSE OUTCOME(S)

On completion of the course students will be able to:

CO1: Explain the fundamental concepts of Artificial Intelligence such as knowledge representation, problem solving and expert systems.

CO2: Apply the use of AI to solve communication problems using Natural Language Processing

CO3: Develop knowledge of decision making and learning methods.

CO4: Develop new facts from existing knowledge base using resolution and unification.

CO5: Apply the way of writing Facts and Rules in order to solve some problems based on rules and to develop systems for question-answer.

CS701B: ROBOTICS

COURSE OUTCOME:

After the successful completion of this course, the student will be able to:

CO1: Describe and explain the microcontrollers used the in robots

CO2: Design the software and build the prototype of robots

CO3: Apply localization and mapping aspects of mobile robotics

CO4: Demonstrate self-learning capability

CS701C: DATA ANALYTICS

COURSE OUTCOME(S):

After completion of this course, students will be able to

CO1: Identify the difference between structured, semi-structured and unstructured data

CO2: Summarize the challenges of big data and how to deal with the same

CO3: Explain the significance of NoSQL databases, Hadoop Ecosystem

CO4: Identify the difference between Pig and Hive

CS702A: SOFT COMPUTING

COURSE OUTCOME

After completion of this course, students will be able to

CO1: Compare the soft computing and hard computing

CO2: Apply the skill in soft computing methodology to some problems

CO3: Explain the concept and techniques of designing and implementing of soft computing methods in real world problem

CO4: Describe the knowledge of the fuzzy Neural network and Genetic Language

CO5: Analyze and optimized the problem of real-life applications

CS702B: NATURAL LANGUAGE PROCESSING

COURSE OUTCOME

On completion of the course students will be able to

CO1: Explain the fundamental concept of NLP, Regular Expression, Finite State Automata along with the concept and application of word tokenization, normalization, sentence segmentation, word extraction, spell checking in the context of NLP

CO2: Explain the concept of Morphology such as Inflectional and Derivational Morphology and different morphological parsing techniques including FSTs

CO3: Implement the concepts related to language modeling with introduction to N-grams, chain rule, smoothing, Witten Bell discounting, backoff, deleted interpolation, spelling and word prediction and their evaluation along with the concept of Markov chain, HMM, Forward and Viterbi algorithm, POS tagging

CO4: Apply the concept of different text classification techniques, sentiment analysis, concepts related to CFG in the context of NLP, concept of lexical semantics, lexical dictionary such as WordNet, lexical computational semantics, distributional word similarity and concepts related to the field of Information Retrieval in the context of NLP

CS702C: WEB TECHNOLOGY

COURSE OUTCOME(S):

On completion of the course students will be able to

CO1: Explain the notions of World Wide Web (www), Internet, HTTP Protocol, Web Browsers, Client-Server etc.

CO2: Develop interactive web pages using HTML, DHTML and CSS

CO3: Apply the knowledge of different information interchange formats like XML

CO4: Design web applications using scripting languages like JavaScript, CGI, PHP

CO5: Implement the server-side programming concepts using servlet, JSP and Net framework

CS703A: CLOUD COMPUTING

COURSE OUTCOME

After completion of course, students would be able to

CO1: Articulate the business model concepts, architecture and infrastructure of cloud computing, including cloud service models and deployment models

CO2: Apply and design suitable Virtualization concept, Cloud Resource Management and design scheduling algorithms

CO3: Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications

CO4: Analyze the core issues of cloud computing such as security, privacy, interoperability, and its impact on cloud application

CS703B: SENSOR NETWORK AND IOT

COURSE OUTCOMES

After completion of this course, students will be able to

CO1: Analyze basic protocols in wireless sensor network

CO2: Explain the concepts of Internet of Things

CO3: Recognize the M2M communication protocols

CO4: Design IoT applications in different domain on embedded platform and be able to analyze their performance

CS703C: CRYPTOGRAPHY AND NETWORK SECURITY

COURSE OUTCOME

After the completion of the course, the students will be able to

CO1: Demonstrate the basic concepts in cryptography

CO2: Apply the deployment of different encryption techniques to secure messages in transit across data networks

CO3: Corroborate various techniques used to assure Integrity and Authentication

CO4: Analyse diverse security measures and issues in practice

CS791A: ARTIFICIAL INTELLIGENCE LAB

COURSE OUTCOME(S):

On completion of the course students will be able to

CO1: Explain the concept of simple programming using PROLOG

CO2: Implement the AI based programs using PROLOG

CO3: Develop the capability to represent various real life problem domains using logic based techniques

CS791B: ROBOTICS LAB

COURSE OUTCOME

After the completion of this course, the student should be able to:

CO1: Explain the practical operation of robots and test their degree of freedoms

CO2: Analyze the gripper performance as per varying objectives

CO3: Carry out case studies with robots for practical applications

CO4: Evaluate the robot using simulation software

CS791C: DATA ANALYTICS LAB

COURSE OUTCOME

After completion of this course, the students will be able to

CO1: Process big data using Hadoop framework

CO2: Apply linear and logistic regression models

CO3: Perform data analysis with machine learning methods

CO4: Perform graphical data analysis

CO5: Implement clustering techniques

CS 792A: SOFT COMPUTING

COURSE OUTCOME

After completion of this course, the students will be able to:

CO1: Explain the concept and techniques of designing and implementing of soft computing methods in real world problem

CO2: Apply the knowledge of the fuzzy Neural network

CO3: Apply the knowledge of Genetic algorithm

CO4: Analyze and optimize the problem of real-life applications

CS792B: NATURAL LANGUAGE PROCESSING LAB
COURSE OUTCOME
On completion of the course students will be able to
CO1: Access text corpora and lexical resources and process of raw text
CO2: Write structured programs for categorizing and tagging of words, segmentation of sentences
CO3: Classify text and extract information from it
CO4: Analyze sentence structure, build feature based grammar, meaning of sentences and to manage linguistic data

CS792C: WEB TECHNOLOGY
COURCE OUTCOMES
After completion of this course students will be able to
CO1: Develop interactive web pages using HTML, DHTML, CSS and image map
CO2: Apply the knowledge of information interchange formats like XML
CO3: Validate fields of web pages using scripting languages like JavaScript
CO4: Develop web applications using PHP and ASP.net
CO5: Implement the server-side programming concepts using servlet, JSP

8th Semester

HU804: PRINCIPLES OF MANAGEMENT
COURSE OUTCOME
After completion of this course, students will be able to
CO1: Analyze critically and evaluate a variety of management practices in the contemporary context
CO2: Explain a variety of management and organizational theories in practice
CO3: Apply the principles of matrix algebra and calculus to address problems in their disciplines and a variety of management and organizational theories in practice.
CO4: Examine the nature of system using the concept of matrix algebra and calculus.

CS801A: MOBILE COMPUTING
COURSE OUTCOME
After completion of this course, students will be able to
CO1: Analyze the working of modern communication technologies.
CO2: Demonstrate the various routing algorithms for both infrastructures based and ad hoc networks.
CO3: Develop mobility and bandwidth management in cellular network
CO4: Design and build an energy efficient and secure mobile computing environment using heterogeneous wireless technologies
CO5: Identify the technical issues related to the recent mobile computing environment.

CS801B: BIO-INFORMATICS
COURSE OUTCOME
After completion of this course, students will be able to
CO1: Explain Bioinformatics technologies with the related concept to DNA, RNA and their implications
CO2: Develop idea in MOLECULAR BIOLOGY
CO3: Describe the concept and techniques of different types of Data Organization and Sequence Databases with different types of Analysis Tools for Sequence Data Banks
CO4: Explain the knowledge of the DNA SEQUENCE ANALYSIS
CO5: Analyse the performance of different types of Probabilistic models used in Computational Biology

CS801C: CYBER LAW AND SECURITY POLICY

COURSE OUTCOMES:

After the completion of the course, the students will be able to

CO1: Explicate the social and intellectual property issues emerging from cyberspace.

CO2: Demonstrate the information technology act, security policies, and legal framework of right to privacy, data security and data protection.

CO3: Elucidate the relationship between commerce and cyberspace

CO4: Explain the network security threats and validate the countermeasures.

CS801D: VLSI DESIGN

COURSE OUTCOME

After completion of this course, students will be able to

CO1: Describe scale of integration – SSI, MSI, LSI, VLSI, Moor's Law, scaling, short channel effect, VLSI design flow, FPGA architecture and construct gate level circuit with PAL & PLA concept.

CO2: Analyze CMOS inverter voltage transfer characteristics with the parameters – VIL, VIH, VOL, VOH, Vth and based on the knowledge of digital circuit design methodology like – CMOS, Pass transistor, TG, DCVSL, dynamic logic, NORA, able to construct schematic of combinational, sequential circuit, SRAM, DRAM cell using MOSFET.

CO3: Calculate value of resistance of current source, MOS diode, current of current mirror circuit, voltage of references (voltage divider, threshold voltage and band gap), emulate resistance of switch capacitor circuit, gain of switch capacitor integrator and 1st order switch capacitor filter, the value of parameters to design CMOS differential amplifier and two stage OP-AMP, gate delay, dynamic power

CO4: Describe fabrication steps of IC and construct stick diagram & layout of CMOS inverter and basic gates based on lambda and micron design rules.

CS802A: PARALLEL COMPUTING

COURSE OUTCOME

On completion of the course students will be able to

CO1: Explain the range of requirements that modern parallel systems have to address.

CO2: Define the functionality that parallel systems must deliver to meet some need.

CO3: Articulate design trade-offs inherent in large-scale parallel system design.

CO4: Demonstrate the potential run-time problems arising from the concurrent operation of many (possibly a dynamic number of) tasks in a parallel system.

CO5: Justify the presence of concurrency within the framework of a parallel system.

CS802B: MACHINE LEARNING

COURSE OUTCOMES:

On completion of the course students will be able to

CO1: Explain fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.

CO2: Analyse the strengths and weaknesses of many popular machine learning approaches.

CO3: Explain underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised, un-supervised learning and reinforcement learning.

CO4: Design and implement various machine-learning algorithms in a range of real-world applications.

CS802D: ADVANCED COMPUTER ARCHITECTURE

COURSE OUTCOME

After completion of this course, students will be able to

CO1: Explain parallelism and pipelining

CO2: Develop knowledge of parallel processing

CO3: Combine the concept and design techniques of interconnection network

CO4: Describe the shared memory architecture, fundamentals of embedded system architecture