Department of Information Technology

Program Outcome

Engineering Graduates will be able to:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature, and analyzecomplex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in

independent and life-long learning in the broadest context of technological change.

Programmed Specific Outcomes of Information Technology (PSO)

1. Graduates will be able to apply basic engineering knowledge to understand and analyze basic-complex problems in the field of Information Technology.
2. Graduates will be able to provide optimized solutions for organizations and individuals through Information Technology specific skills.
3. Graduates will be able to work in a group to manage projects and human resources in the field of Information Technology.
4. Graduates will be able to contribute in the research and development field of Information Technology through the lifelong learning to serve the society and nation.

Syllabus- 1st Semester

Course Name: Mathematics-I

Course Code: M 101

Course Outcomes:

COs	DESCRIPTIONS
CO1	Recall the distinctive characteristics of matrix algebra and calculus.
CO2	Understand 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.

Course Name: Physics –I

Course Code: PH 101

Course Outcomes:

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

Course Name: Basic Electronics Engineering

Course Code: EC101

Course Outcomes:

CO1	Students able to describe the fundamentals of Semiconductors
CO2	Students able to explain V-I characteristics of P-N Junction Diode, zenerdiode , working of diode rectifier, clipper, clamper, and regulator circuit
CO3	Students able to analyze characteristics of Bipolar junction transistor(BJT) under CE, CB, CC mode of operation and its biasing therein
CO4	Students able to illustrate the operations of JFET, MOSFET and the CS,CD , CG configuration using JFET
CO5	Students able to determine parameters due to effect of feedback in amplifier
CO6	Students able to construct inverting amplifier circuit , non-inverting amplifier circuit ,adder circuit , integrator and differentiator circuit using Operational Amplifier IC

Course Name: English

Course Code: HU101

Course Outcomes:

CO1: Know about and employ communication in a globalized workplace scenario.

CO2: Understand 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.

Course Name: Physics I Lab

Course Code: PH 191

Course Outcomes:

CO1 : Demonstrate experiments allied to their theoretical concepts

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

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

Course Name: Basic Electronics Engineering Lab

Course Code: EC 191

Course Outcomes:

CO1	Knowledge of Electronic components such as Resistors, Capacitors, Diodes, Transistors measuring equipment like DC power supply, Multimeter, CRO, Signal generator, DC power supply.
CO2	Analyse 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	Able to know the application of Diode, BJT & OPAMP.

Course Name: Workshop/Manufacturing Practices

Course Code: ME 192

Course Outcomes:

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

Syllabus- 2nd Semester

Course Name: Mathematics - II

Course Code: M 201

Course Outcomes:

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	Understand the concept of Laplace transform to solve ordinary differential equations.

Course Name: Chemistry

Course Code: CH201

Course Outcomes:

CO1: Able to describe the fundamental properties of atoms & molecules, atomic structure and the periodicity of elements in the periodic table

CO2: Able to apply fundamental concepts of thermodynamics in different engineering applications.

CO3: Able to apply the knowledge of water quality parameters, corrosion control & polymers to different industries.

CO4: Able to determine the structure of organic molecules using different spectroscopic techniques.

CO5: Capable to 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.

Course Name: Basic Electrical Engineering

Course Code: EE201

Course Outcomes:

CO1: To understand Basic Electrical circuits, Power distribution and Safety measures.

CO2: To analyze an apply DC network theorems.

CO3: To analyze and apply concept of AC circuits of single-phase and three-phase.

CO4: To analyze and apply concepts of AC fundamentals in solving AC network problems.

CO5: To understand basic principles of Transformers and Rotating Machines.

Course Name: Programming for Problem Solving

Course Code: CS 201

Course Outcomes:

CO1	Understand and 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	Understand the dynamic behavior of memory by the use of pointers.

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

Course Name: Engineering Mechanics

Course Code: ME 201

Course Outcomes:

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

CO2: To 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: Understand and apply the concept of virtual work, rigid body dynamics and systems under vibration.

Course Name: Programming for Problem Solving Lab

Course Code: CS291

Course Outcomes:

CO1	Learn the concept of DOS system commands and editor.
CO2	To formulate the algorithms for simple problems and to translate given algorithms to a working and correct program.
CO3	To be able to identify and correct syntax errors / logical errors as reported during compilation time and run time.

CO4	To be able to write iterative as well as recursive programs.
CO5	Learn the concept of programs with Arrays, Pointers, Structures, Union and Files.

Course Name: Chemistry Lab

Course Code: CH 291

Course Outcomes:

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

CO2: Able to analyse and determine the composition of liquid and solid samples working as an individual and also as an team member

CO3: Able to analyse different parameters of water considering environmental issues

CO4: Able to synthesize drug and polymer materials.

CO5: Capable to design innovative experiments applying the fundamentals of chemistry

Course Name: Basic Electrical Engineering Laboratory

Course Code: EE291

Course Outcomes:

CO1: Identify and use common electrical components.

CO2: To develop electrical networks by physical connection of various components and analyze the circuit behavior.

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

Course Name: Engineering Graphics & Design

Course Code: ME 291

Course Outcomes:

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

CO2: Know 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.

Course Name: Lang. Lab. and Seminar Presentation

Course Code: HU 291

Course Outcomes:

CO1: Able to understand advanced skills of Technical Communication in English through Language Laboratory.

CO2: Able to apply listening, speaking, reading and writing skills in societal and professional life.

CO3: Able to demonstrate the skills necessary to be a competent Interpersonal communicator.

CO4: Able to analyze communication behaviours.

CO5: Able to adapt to multifarious socio-economical and professional arenas with the help of effective communication and interpersonal skills.

Course Name: NSS/Physical Activities/ Meditation & Yoga/ Photography/Nature

Club Course Code: MC 281

Course Objectives:

- To increase student awareness about the weaker and unprivileged sections of society
- To expose students to environmental issues and ecological concerns
- To make students self aware about their participatory role in sustaining society and the environment

Syllabus- 3rd Semester

Course Name: Data Structure and Algorithm

Course Code: IT 301

Course Outcome: At the end of the course students will be able to

CO1	Use different kinds of data structures which are suited to different kinds of applications, and some are highly specialized to specific tasks.

CO2	Manage large amounts of data efficiently, such as large databases and internet indexing services.
CO3	Use efficient data structures which are a key to designing efficient algorithms.
CO4	Use some formal design methods and programming languages which emphasize on data structures, rather than algorithms, as the key organizing factor in software design.
CO5	Store and retrieve data stored in both main memory and in secondary memory.

Course Name: Analog and Digital Electronics

Course Code: IT 302

Course Outcome: After completion of this course student will be able to

CO1	Understand basic analog and digital electronics, including semiconductor properties, operational amplifiers, combinational and sequential logic and analog-to-digital
	digital-to-analog conversion techniques

CO2 Identify different symbols, working principles of basic Digital electronics circuits for data processing application

CO3 Analyze the characteristics of basic digital circuits

CO4 Design analog amplifiers, combinational logic devices and sequential logic devices like counters and registers

Course Name: Mathematics - III

Course Code: M (IT) 301

Course Outcome: At the end of the course students will be able to

CO1	Recall the distinctive characteristics of probability distribution, abstract algebra, and graph theory.
CO2	Demonstrate the theoretical working of probability distribution, abstract algebra, and graph theory.
CO3	Compute the probability of real world uncertain phenomena by indentifying probability distribution that fits the phenomena.
CO4	Construct the shortest path and minimal spanning tree from a given graph using the algorithms of graph theory.

Course Name: Physics II

Course Code: PH 301

Course Outcome: After completion of this course student 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

Course Name: Numerical Methods and Statistics

Course Code: M (IT) 302

Course Outcome: At the end of the 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.

Course Name: Data Structure Lab

Course Code: IT391

Course Outcome: After completion of this course student will be able to

CO1	Understand the concept of dynamic memory management, data types, basic data structures, and complexity analysis.
CO2	Introduce the concept of data structures through ADT.
CO3	Choose the appropriate linear and non-linear data structure and algorithm design method for a specified application design.
CO4	Analyze the complexity of the problems.

Course Name: Analog and Digital Electronics Lab

Course Code: IT392

Course Outcome: At the end of the course students will be able to know to find out:

CO1	Examine the characteristics of analog electronic circuit devices such as BJTs and FETs, amplifiers
CO2	Make use of different basic logic gates and universal gates
CO3	Implement the combinational circuits in digital electronics using basic logic gates
CO4	Construct sequential circuits like registers and counters using flip-flops and basic gates

Course Name: Physics-II Lab

Course Code: PH391

Course Outcome: At the end of the course students will be able to know to find out:

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

Course Name: Numerical Methods and Statics Lab

Course Code: M(IT)392

Course Outcome:

On successful completion of the learning sessions of the course, the learner 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.

Course Name: Behavioral& Interpersonal Skills

Course Code: MC-381

Course Outcome:

CO1	It will equip the student to handle workplace interpersonal communication in an effective manner.
CO2	To enable students with strong oral and written interpersonal communication skills.
CO3	To prepare students to critically analyze workplace situations and take appropriate decisions.
CO4	To make students campus ready through proper behavioral and interpersonal grooming.

CO5	Integration of enhanced skill set to design and frame team based Project Report and Presentation.

Syllabus-4th Semester

Course Name: Computer Organization & Architecture

Course Code: IT 401

Course Outcome: At the end of the course students will be able to

CO1:	Understand the organization of the Control unit, Arithmetic and Logical unit, Memory unit and the I/O unit of digital computer system.
CO2:	Identify the structure and functioning of a digital computer including its overall system architecture, operating system, and digital components.
CO3:	Analyze various design techniques of CPU, Memory, pipelining, ALU, interconnecting I/O devices and microprogramming in order to achieve multiprocessing.
CO4:	Develop and Design quantitative performance evaluation of computer systems.

Course Name: Object Oriented Programming using JAVA

Course Code: IT 402

Course Outcome: At the end of the course students will be able to

CO1:	Understand the key concepts of object oriented programming and have an ability to design Object Oriented programs.
CO2:	alyze complex programming problems and optimize the solutions.
CO3:	aluate and analyze different solution based on object oriented concepts.
CO4:	Apply the concepts of object oriented programming for implementing solution of dynamic problems in the field of Information Technology.

Course Name: Formal Language and Automata Theory

Course Code: IT 403

Course Outcome: At the end of the course students will be able to

CO1:	Analyze situations in related areas of theory in computer science.
CO2:	Model, compare and analyze different computational models using combinatorial methods.
CO3:	Apply rigorously formal mathematical methods to prove properties of languages, grammars and Automata.
CO4:	Construct algorithms for different problems and argue formally about correctness on different restricted Machine models of computation.
CO5:	Identify limitations of some computational models and possible methods of proving them.

Course Name: Communication Engineering & Coding Theory

Course Code: IT 404

Course Outcome: At the end of the course students will be

CO1:	Able to understand basics of communication system and coding schemes.
CO2:	Able to apply the basic concept of PCM systems and baseband transmission schemes.
CO3:	Able to analyze and evaluate band pass signalling schemes.
CO4:	Able to Create spectral characteristics of band pass signalling schemes and asses noise performance.

Course Name: Values & Ethics in Profession

Course Code: HU 401

Course Outcome: At the end of the course students will be

CO1:	Able to understand the core values that shape the ethical behaviour of an engineer and Exposed awareness on professional ethics and human values.
CO2:	Able to understand the basic perception of profession, professional ethics, various moral issues & uses of ethical theories.
CO3:	Able to understand various social issues, industrial standards, code of ethics and role of professional ethics in engineering field.
CO4:	Able to aware of responsibilities of an engineer for safety and risk benefit analysis, professional rights and responsibilities of an engineer.
CO5:	Able to acquire knowledge about various roles of engineers in variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives.

Course Name: Computer Organization and Architecture Lab

Course Code: IT 491

Course Outcome: At the end of the course students will be able to

CO1:	Remember the basic designing principles of digital electronics circuits.
CO2:	Demonstrate Hardware Description Language (HDL) in order to implement skills in designing Architectural solutions and describing designs using VHDL.
CO3:	Apply fundamentals of digital design and extend the learning to design sequential circuits.
CO4:	Analyze&Examine the digital circuit design using Simulation tool.

Course Name: Object Oriented Programming Lab

Course Code: IT 492

Course Outcome: At the end of the course students will be able to

CO1:	Apply object oriented programming concepts in designing programs.
CO2:	Analyze different dimensions of a problem and provide optimal solutions.
CO3:	Evaluate and analyze different solution based on object oriented concepts.
CO4:	Implement solutions of real-life problems in the field of Information Technology.

Course Name: Programming Skill Development Lab

Course Code: IT 493

Course Outcome: At the end of the course students will be able to

CO1:	Understand basic of Python Programming Language.
CO2:	Analyze problems and design effective solutions of them.
CO3:	Apply the best features of Python to program real life problems.
CO4:	Implement optimal solution of a given problem.

Course Name: Environmental Science

Course Code: MC 401

Course Outcome: At the end of the course students will be able to

CO1:	Describe the structure and function of environment and different types of environmental pollution.
CO2:	Identify all types of resources and learn the quality parameter to maintain proper balance.
CO3:	Demonstrate environmental problems like global warming, acid rain, natural and manmade disasters.
CO4:	Demonstrate the controlling method of environmental pollution and apply their knowledge for environment management.
CO5:	Apply the method of synthesis

5th Semester

Course Name: Design and Analysis of Algorithm

Course Code: IT 501

Course Outcome

After completion of this course students will be able to

CO1: Understanding the time complexity of the basic algorithms for the classic problems in various domains.

CO2: Apply the classic algorithms to solve different problems.

CO3: Evaluate existing algorithms by calculating the time complexity.

CO4: Design algorithm to solve various problems in

Course Name: Software Engineering

Course Code: IT 502

Course Outcome

After completion of this course student will be able to

CO1: Ability to analysis and design of complex systems and meet ethical standards, legal Responsibilities.

CO2: Ability to apply software engineering principles, techniques and develop, maintain, Evaluate large-scale software systems.

CO3: To produce efficient, reliable, robust and cost-effective software solutions and perform independent research and analysis.

CO4: Ability to work as an effective member or leader of software engineering teams and manage time, processes and resources effectively by prioritizing competing demands to achieve personal and team goals.

Course Name: Operating System

Course Code: IT 503

Course Outcome:

After completion of this course students will be able to

CO1: Understand competence in recognizing and using operating system features.

CO2: Apply knowledge of different operating system algorithms.

CO3: Analyze theory and implementation of different operating system aspect and the structure and basic architectural components involved in operating system.

CO4: Evaluate different operating system approaches.

Course Name: Programming Practice with C++

Course Code: IT 504A

Course Outcome

After completion of this course student will be able to

CO1: Understand the basic concept of object oriented programming

CO2: Apply the concept of object oriented programming concept using C++

CO3: Analyse the different features of object oriented programming in the context of C++

CO4: Evaluate concept of

Course Name: Artificial Intelligence

Course Code: IT 504B

Course Outcome

After completion of this course student will be able to

CO1: Understand various AI search algorithms (uninformed, informed, heuristic, constraint satisfaction).

CO2: Apply facts, rules, and concepts of knowledge representation (logic based, frame-based, semantic nets), inference and theorem proving.

CO3: Analyze working knowledge of reasoning in the presence of incomplete and/or uncertain information.

CO4: Evaluate and create knowledge representation, reasoning, and machine learning techniques for the solution of real-world problems.

Course Name: Microprocessor & Microcontroller

Course Code: IT 504C

Course Outcome:

After completion of this course student will be able to

CO1: Describe the general architecture of a microcomputer system and architecture&organization of 8085 & 8086 Microprocessor and understand the difference between 8085 and advanced microprocessor.

CO2: Understand and classify the instruction set of 8085 microprocessor and distinguish the use of different instructions and apply it in assembly language programming.

CO3: Recognize 8051 micro controller hardware, input/output pins, ports, external memory, counters and timers, instruction set, addressing modes, serial data i/o, interrupts

CO4: Understand and realize the Interfacing of memory & various I/O devices with 8085 microprocessor.

Course Name: Industrial & Financial Management

Course Code: HU 503

Course Outcome

After completion of this course student will be able to

CO1: Explain and describe various technology-based business models and the dynamics of value creation,

value proposition, and value capture in industrial enterprises.

CO2: Select, interpret and use different costing techniques as a basis for decisions in various business situations.

CO3: Understand the basic principles of financial accounting and reporting.

CO4: Produce and interpret an industrial company's Annual Statement, at a basic level.

Course Name: Constitution of India

Course Code: MC501

Course Outcome:

After completion of this course student will be able to

CO1: Develop human values, create awareness about law ratification and significance of Constitution

CO2: Comprehend the Fundamental Rights and Fundamental Duties of the Indian Citizen to implant morality, social values and their social responsibilities.

CO3: Create understanding of their Surroundings, Society, Social problems and their suitable solutions.

CO4: Familiarize with distribution of powers and functions of Local Self Government.

CO5: Realize the National Emergency, Financial Emergency and their impact on Economy of the country.

Course Name: Design Analysis of Algorithm Lab

Course Code: IT 591

Course Outcome

After completion of this course student will be able to

CO1: Analyze a problem and design the solution for the problem.

CO2: Optimize the solution with respect to time complexity & memory usage.

CO3: Apply different algorithmic approaches for solving the problems.

CO4: Analyze the efficiency of algorithms using time and space complexity theory

Course Name: Software Engineering Lab

Course Code: IT 592

Course Outcome:

After completion of this course student will be able to

CO1: Ability to analysis and design of complex systems and meet ethical standards, legal responsibilities

CO2: Ability to apply software engineering principles, techniques and develop, maintain, evaluate large-scale software systems.

CO3: To produce efficient, reliable, robust and cost-effective software solutions and perform independent research and analysis.

CO4: Ability to work as an effective member or leader of software engineering teams and manage time, processes and resources effectively by prioritizing competing demands to achieve personal and team goals.

Course Name: Operating System Lab

Course Code: IT 593

Course Outcome

After completion of this course student will be able to

CO1: Describe the important computer system resources and the role of operating system in their management policies and algorithms.

CO2: Understand the process management policies and scheduling of processes by CPU

CO3: Evaluate the requirement for process synchronization and coordination handled by operating system

CO4: Describe and analyze the memory management and its allocation policies

Course Name: Programming Practice with C++ Lab

Course Code: IT 594A

Course Outcome

After completion of this course student will be able to

CO1: Apply the concept of Object oriented programming in developing program

CO2: Analyse and evaluate different feature of C++ in different laboratory experiments

CO3: Develop small to big scale project using C++

Course Name: Artificial Intelligence Lab

Course Code: IT 594B

Course Outcome:

After completion of this course student will be able to

CO1: Understand and recognize various AI search algorithms and AI tools.
CO2: Apply the fundamentals of knowledge representation, inference and theorem proving using
CO3: Analyze working knowledge of reasoning in the presence of incomplete and/or uncertain information.
CO4: Evaluate and create knowledge representation, reasoning, and machine learning techniques for the solutions of real-world problems.

Course Name: Microprocessor and Microcontroller

Lab Course Code: IT 594C

Course Outcome

After completion of this course student will be able to

CO1: Able to solve small assignments using the 8085 basic instruction sets and memory mapping through trainer kit and simulator.
CO2: Able to write 8085 assembly language programs like Addition, Subtraction, Multiplication, Square, Complement, Look up table, Copying a block of memory, Shifting, Packing and unpacking of BCD numbers, Ascending order, Descending order etc. using trainer kit.

CO3: Able to validate the interfacing technique using 8255 trainer kit through subroutine calls and IN/OUT instructions like glowing LEDs accordingly, stepper motor rotation etc

CO4: Able to test fundamental of 8051 programs using the trainer kit.

6th Semester

Course Name: Database Management System

Course Code: IT 601

Course Outcome

After completion of this course student will be able to

CO1: Understand Database Management System, explain fundamental elements of a database management system, compare the basic concepts of relational data model, entity relationship model, file organization and use appropriate index structure.

CO2: Apply efficient query optimization techniques, suitable transaction management, concurrency control mechanism and recovery management techniques.

CO3: Evaluate a database design and improve the design by normalization.

CO4: Design entity-relationship diagrams to represent simple database application scenarios, translate entity-relationship diagrams into relational tables, populate a relational database and formulate SQL queries on the data.

Course Name: Web Technology

Course Code: IT 602

Course Outcome: At the end of the course students will be able to

CO1: Understand and evaluate web application architecture, technologies and frameworks.

CO2: Apply the knowledge of web technology in developing web applications

CO3: Evaluate different solutions in field of web application development.

CO4: Implement small to large scale project to provide live solution in web application development fields

Course Name: Computer Networking

Course Code: IT 603

Course Outcome

After completion of this course student will be able to

CO1: Understand the network model and architecture

CO2: Apply different networking concepts for implementing network solution.

CO3: Analyse different networking functions and features for identifying optimal solutions

CO4: Evaluate and implement routing algorithms for implanting solution for the real-life problems

Course Name: E-Commerce and ERP

Course Code: IT604A

Course Outcome

After completion of this course student will be able to

CO1: Understand the policy issues related to privacy, intellectual property rights, and establishing identity those are germane to electronic commerce along with the Internet and related technologies.

CO2: Comprehend the underlying economic mechanisms and driving forces of E-Commerce.

CO3: Analyse the impact that electronic commerce is facing and outlines the different digital transaction process and basic concepts of e-commerce.

CO4: Identify different technologies and IT support used in ERP and apply different tools used in ERP.

Course Name: Digital Image Processing

Course Code: IT 604B

Course Outcome:

After completion of this course students will be able to

CO1: Understand the fundamental concepts of a digital image processing system.

CO2: Analyze images in the spatial as well as frequency domain using various transformation techniques for improving the image quality.

CO3: Implement various compression techniques.

CO4: Evaluate image segmentation and representation techniques

Course Name: Soft Computing

Course Code: IT 604C

Course Outcome

After completion of this course student will be able to

CO1: Understand importance of soft computing.
CO2: Remember different soft computing techniques like Genetic Algorithms, Fuzzy Logic, Neural Networks and their combination.
CO3: Implement algorithms based on soft computing.
CO4: Apply soft computing techniques to solve engineering or real-life problems.

Course Name: Database Management System Lab

Course Code: IT 691

Course Outcome:

After completion of this course student will be able to

CO1: Design and implement a database schema for a given problem-domain

CO2: Create and maintain tables using PL/SQL Course Outcome

CO3: Populate and query a database

CO4: Application development using PL/SQL & front-end tools

Course Name: Web Technology Lab

Course Code: IT 692

Course Outcome: At the end of the course students will be able to CO1:

Apply the knowledge of web technology in developing web applications

CO2: Evaluate different solutions in field of web application development

CO3: Implement small to large scale project to provide live solution in web application development fields.

Course Name: Computer Networking Lab

Course Code: IT 693

Course Outcome

After completion of this course student will be able to

CO1: Understand and apply different network commands.

CO2: Analyze different networking functions and features for implementing optimal solutions.

CO3: Apply different networking concepts for implementing network solution.

CO4: Implement different network protocols.

Course Name: E-Commerce and ERP Lab

Course Code: IT694A

Course Outcome

After completion of this course student will be able to

CO1: Understand the concept of PhP framework.

CO2: Analyzing different client and server side components for developing application.

CO3: Apply and concept for developing MVC application.

CO4: Apply and implement the solution to real life problem using PHP concepts.

Course Name: Digital Image Processing Lab

Course Code: IT 694B

Course Outcome:

After completion of this course students will be able to

CO1: Apply enhancing operations on the image using spatial filters and frequency domain filters.

CO2: Analyse the characteristics of the image using different transformation techniques.

CO3: Estimate the efficiency of the compression techniques on the images. CO4: Implement different segmentation operations of images.

Course Name: Soft Computing Lab

Course Code: IT 694C

Course Outcome

After completion of this course student will be able to

CO1: Understand importance of soft computing techniques and tools.

CO2: Understand different soft computing techniques like Genetic Algorithms, Fuzzy Logic, Neural Networks and their combination.

CO3: Implement algorithms based on soft computing techniques.

CO4: Apply soft computing techniques to solve engineering or real life problems.

7th Semester

Course Name: Cloud Computing
Course Code: IT701A
Course Outcome:

At the end of the course students will be able to:

CO1 Understand the basic architecture of cloud computing

CO2 Apply the knowledge of cloud computing in the evaluation of the computing model

CO3 Analyze different problems in the domain of cloud computing

CO4 Evaluate the different models and solutions provided in the field of cloud computing

Course Name: Computer Graphics and Multimedia
Course Code: IT701B
Course Outcome:

At the end of the course students will be able to:

CO1 Understand the basic computer graphics and Identify different media representations of different multimedia data and data formats, windows, clipping and view-ports object representation.

CO2 Analyze geometric, mathematical and algorithmic concepts necessary for programming computer graphics.

CO3 Apply different coding technique for solving real world problems.

CO4 Evaluate the software utilized in constructing computer graphics and multimedia applications.

Course Name: Distributed System
Course Code: IT701C
Course Outcome:

At the end of the course students will be able to:

CO1 Understand the knowledge of the basic elements and concepts related to distributed system technologies for identify core architectural aspects of distributed systems;

CO2 Identify the main underlying components of distributed systems (such as RPC, file systems) and use those components for building a distributed system;

CO3 Use and apply important methods in distributed systems to support scalability and fault tolerance;

CO4 Demonstrate experience in building large-scale distributed applications.

Course Name: Machine Learning
Course Code: IT701D
Course Outcome:

At the end of the course students will be able to:

CO1 Recognize the characteristics of machine learning that make it useful to real-world problems.

CO2 Characterize machine learning algorithms as supervised, semi-supervised, and unsupervised.

CO3 Be able to use support vector machines.

CO4 Understand the learning algorithm for hidden Markov model with latent variables.

Course Name: Cryptography and Network Security
Course Code: IT702A
Course Outcome:

After completion of this course student will be able to

CO1 Identify computer and network security threats, classify the threats, and understand different technique of cryptography and security.

CO2 Analyze existing cryptographic algorithm, authentication, and key agreement protocols, identify the strength and weaknesses of existing algorithm

CO3 Apply different algorithm and technique of encryption and decryption method over informationand security techniques to the existing computer and network platforms.

CO4 Design and develop cryptography algorithm and network technique security product or code, investigate the strong and weak points of the product or code.

Course Name: Data Warehousing and Data Mining
Course Code: IT702B
Course Outcome:

After completion of this course student will be able to

CO1 Understand the basic concepts of data warehousing and data mining.

CO2 Apply the various mining algorithms for extract knowledge from data warehouse.

CO3 Analyze different data warehousing methodologies and data mining algorithms

CO4 Design a data warehouse

Course Name: Advanced Computer Architecture
Course Code: IT702C

Course Outcome:

At the end of the course students will be able to:

CO1 Understand the operations of modern and high-performance computer systems

CO2 Identify cache and memory related issues in multi-processors architecture

CO3 Analyze performance of different ILP techniques of computer architecture

CO4 Evaluate performance of different architectures with respect to various parameter & Design the mechanism by which the performance of the system is enhanced

Course Name: Compiler Design
Course Code: IT702D
Course Outcome:

At the end of the course students will be able to:

CO1 To understand the knowledge of parsing, lexical and syntax analysis.

CO2 To analyze various parsing techniques, code optimization.

CO3 To apply the knowledge about the compilers they practically use.

CO4 To learn how the parse trees are generated, errors are handled and code is optimized.

Course Name: Sensor Network

Course Code: IT703A

Course Outcome:

After completion of this course student will be able to

CO1 Illustrate the fundamental principles of various types of sensors.

CO2 Illustrate the different types of transducers available.

CO3 Employ appropriate sensors to perform engineering tasks and scientific researches

CO4 Design of different Sensors.

Course Name: Pattern Recognition
Course Code: IT703B
Course Outcome:

At the end of the course students will be able to:

CO1 Understand basic concepts in pattern recognition
CO2 Formulate and describe various applications in pattern recognition
CO3 Gain knowledge about state-of-the-art algorithms used in pattern recognition research
CO4 Understand pattern recognition theories, such as Bayes classifier, linear discriminant analysis
CO5 Demonstrate successful applications to process and analyze images, and to make automatic decisions based on extracted feature information

Course Name: Internet Technology
Course Code: IT703C
Course Outcome:

At the end of the course students will be able to:

CO1 Understand advanced networking concepts and internet and web application architectures
CO2 Apply and Analyze d different advanced routing protocols being used in web application development
CO3 Evaluate and Analyze different solution available in the field of networking and web application development such as http and the World Wide Web, HTML, and Java Scripts;
CO4 Implement solution for different critical network related issues as; implementing the design using the client/server model, testing and documenting the solutions developed.

Course Name: Robotics
Course Code: IT703D
Course Outcome:

After completion of this course student will be able to

CO1 Understand the math and computational methods necessary to model and solve kinematic problems involving robot manipulators and mobile robots

CO2 Familiarize with the most common robot sensors and understand fundamental sensor processing algorithms and their engineering trade-offs

CO3 Analyze the computational challenges inherent in fundamental mobile robotic tasks

CO4 Develop simple robot control systems integrating perception, planning, and action

Course Name: Modeling and Simulation
Course Code: IT704A
Course Outcome

After completion of this course student will be able to

CO1: Summarize the issues in Modeling and Simulation

CO2: Explain the System Dynamics & Probability concepts in Simulation. **CO3:** Solve the Simulation of Queuing Systems

CO4: Analyze the Simulation output

CO5: Identify the application area of Modeling and Simulation and apply in the corresponding fields

Course Name: Microelectronics and VLSI Design
Course Code: IT704B
Course Outcome:

At the end of the course students will be able to:

CO1 Use mathematical methods and circuit analysis models in analysis of CMOS digital electronics circuits, including logic components and their interconnect

CO2 Create models of moderately sized CMOS circuits that realize specified digital functions

CO3 Apply CMOS technology-specific layout rules in the placement and routing of transistors and interconnect, and to verify the functionality, timing, power, and parasitic effects

CO4 Understand of the characteristics of CMOS circuit construction and the comparison between different state-of-the-art CMOS technologies and processes

CO5 Complete a significant VLSI design project having a set of objective criteria and design constraints

Course Name: Mobile Communication
Course Code: IT704C
Course Outcome:

At the end of the course students will be able to:

CO1 Understand the basic of Mobile Communication system & its generation in wireless network

CO2 Analyze the network infrastructure requirements to support mobile devices and users.

CO3 Apply the knowledge to determine the functionalities, techniques, protocols and architecture employed in wireless local area networks, cellular networks, and performs basic requirements analysis.

CO4 Evaluate the techniques and technologies to design and communicate a simple mobile application for smaller devices.

Course Name: Operations Research
Course Code: IT704D
Course Outcome:

At the end of the course students will be able to:

CO1 Design knowledge-base representation models

CO2 Analyze the performance of rule-based-systems

CO3 Develop rule-based expert systems and planning tools

CO4 Implement heuristic search algorithms for real life problem solving

Course Name: Cloud Computing Lab
Course Code: IT791A
Course Outcome:

At the end of the course students will be able to:

CO1 Apply the concept to solve practical application

CO2 Analyzing different service in cloud computing

CO3 Evaluate different available service with Amazon and Azure
CO4 Design Cloud based application

Course Name: Computer Graphics and MULTIMEDIA Lab
Course Code: IT791B
Course Outcome:

At the end of the course students will be able to:

CO1 Analyze the effects of scale and use on both presentation and lower level requirements

CO2 Apply 3D graphical scenes using open graphics library suits

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

CO4 Implement image manipulation, enhancement, and basic transformations on objects and clipping algorithm on lines.

Course Name: Distributed System
Course Code: IT791C
Course Outcome:

At the end of the course students will be able to:

CO1 Understand the knowledge of the basic elements and concepts related to distributed system technologies for identify core architectural aspects of distributed systems;

CO2 Identify the main underlying components of distributed systems (such as RPC, file systems) and use those components for building a distributed system;

CO3 Use and apply important methods in distributed systems to support scalability and fault tolerance;

CO4 Demonstrate experience in building large-scale distributed applications.

Course Name: Machine Learning using R Programming Lab
Course Code: IT791D
Course Outcome:

At the end of the course students will be able to:

CO1 Master the use of the R interactive environment

CO2 Develop Loop constructs in R

CO3 Use R for descriptive statistics

CO4 Use R for inferential statistics

8th Semester

Course Name: Principles of Management
Course Code: HU804
Course Outcome:

At the end of the course students will be able to:

CO1 Recall and identify the relevance of management concepts

CO2 Apply management techniques for meeting current and future management challenges faced by the organization

CO3 Compare the management theories and models critically to solve real life problems in an organization

CO4 Apply principles of management in order to execute the role as a manager in an organization.

Course Name: Blockchain
Course Code: IT801A
Course Outcome:

At the end of the course students will be able to:

CO1 Understand the basic concepts of blockchain and it's architectures.

CO2 Analyze different issues in the domain of blockchain and understand the practical applications of blockchain.

CO3 Evaluate and analyze different solutions for the real life problems related to the blockchain.

CO4 Apply the concepts of blockchain to design large scale distributed and secure data storage systems.

Course Name: Big Data Analytics
Course Code: IT801B

Course Outcome:

After completion of this course student will be able to

CO1 Understand the fundamental concepts of big data and analytics
CO2 Understand about clustering, classification and association techniques
CO3 Summarize about stream computing.
CO4 Summarize about the research that requires the integration of large amounts of data
CO5 Summarize about tools and practices for working with big data

Course Name: Virtual Reality

Course Code: IT801C
Course Outcome:

At the end of the course students will be able to:

CO1 Understand the basic concept of Virtual Reality

CO2 Apply the knowledge of virtual reality in the evaluation of different models.

CO3 Analyze different problems in the domain of Virtual Reality

CO4 Evaluate the different solutions provided in the field of virtual reality

Course Name: Natural Language Processing

Course Code: IT801D
Course Outcome:

After completion of this course student will be able to

CO1 Understand the models, methods, and algorithms of statistical Natural Language Processing (NLP) for common NLP tasks.

CO2 Analyze the core computer science concepts and algorithms in the processing of natural language.

CO3 Apply the methods to solve new NLP problems and the problems outside NLP.

CO4 Design a system which processes a natural language & be familiar with research field.

Course Name: Bio-Informatics
Course Code: IT802A
Course Outcome:

At the end of the course students will be able to:

CO1 Understand the knowledge of Bioinformatics technologies with the related concept of DNA, RNA and their implications.

CO2 Analyze the techniques of different types of Data Organization and Sequence Databases with different types of Tools for Sequence Data Banks.

CO3 Apply the knowledge of the DNA Sequence Analysis.
CO4 Evaluate the performance of different types of Probabilistic models used in Computational Biology.

Course Name: Embedded System
Course Code: IT802B
Course Outcome:

After completion of the course, the students will be able to
CO1 Understand the architecture and classifications of different embedded systems and the related programming knowledge.
CO2 Understand the concepts of embedded systems like I/O, timers, interrupts, interaction with peripheral devices.
CO3 Choose case-specific debugging technique for an embedded system.
CO4 Design various real time systems using embedded systems.

Course Name: Internet of Things
Course Code: IT802C
Course Outcome:

At the end of the course students will be able to:
CO1 Understand the basic concepts of IoT and it's architectures.
CO2 Analyze different issues in the domain of IoT and understand the practical applications of IoT.
CO3 Evaluate and analyze different solution for the real life problems of IoT.
CO4 Apply the concepts of IoT to design different smart tools.

Course Name: Deep Learning

Course Code: IT802D

Course Outcome:

After completion of this course student will be able to
CO1 Identify the deep learning algorithms which are more appropriate for various types of learning tasks in various domains.
CO2 Implement deep learning algorithms and solve real-world problems.
CO3 Understand the working knowledge of neural networks and deep learning, and data needs of deep learning
CO4 Design and explore the parameters for neural networks

Course Name: Data Science
Course Code: IT803A

Course Outcome

After completion of this course student will be able to

CO1: Demonstrate proficiency with statistical analysis of data.

CO2: Develop the ability to build and assess data-based models.

CO3: Execute statistical analyses with professional statistical software.

CO4: Demonstrate skill in data management.

Course Name: Cyber Law and IPR

Course Code: IT803B

Course Outcome:

At the end of the course students will be able to:

CO1 Understand the policy issues related to electronic filing of documents with the Government agencies and further to amend the Indian Penal Code, the Indian Evidence Act, 1872, the Bankers' Books Evidence Act, 1891 and the Reserve Bank of India Act, 1934 and for matters connected therewith or incidental thereto.

CO2 Analyze the effectiveness of the prevailing information security law practices.

CO3 Identify the importance of lawful recognition for transactions through electronic data interchange and other means of electronic communication, commonly referred to as electronic commerce or E-Commerce.

CO4 Comprehend the architecture that can cater to the needs of the social information security.

Course Name Cluster and Grid Computing
Course Code: IT803C
Course Outcome:

At the end of the course students will be able to:

CO1 Understand the basic architecture of Cluster and Grid computing

CO2 Apply the knowledge of Cluster and Cluster computing in the evaluation of the computing model

CO3 Analyze different problems in the domain of Cluster and Grid computing

CO4 Evaluate the different models and solutions provided in the field of Cluster and Grid computing

Course Name: Entrepreneurship Development
Course Code: IT803D
Course Outcome:

At the end of the course students will be able to:

CO1 Understand the Meaning and Importance Evolution of term ‘Entrepreneurship

CO2 Apply the knowledge in the evaluation of different models.

CO3 Analyze different problems in the domain entrepreneurship skill development

CO4 Evaluate the different solutions, rules and regulation provided in the field of developing enterprises