Vision:

To be a valuable resource for industry and society through quality education and research in Computer Engineering

Mission:

1. To impart knowledge and inculcate skills by nurturing a conducive learning environment
2. To promote research and development in collaboration with industry
3. To build conducive environment for R&D based innovation to serve emerging needs of society
4. To develop attitude and inculcate values for character building and holistic development

Programme Educational Objectives (PEO's):

PEO1: To develop core competencies in the field of Computer Engineering

PEO2: To inculcate professional skills and ethics

PEO3: To develop an ability to conduct research

Program Outcomes:

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

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

PO 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.

PO 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.

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

PO 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.

PO 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.

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

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

PO 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.

PO 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.

PO 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.

Program Specific Outcomes:

PSO 1: Provide solutions using appropriate data structure and efficient algorithms

PSO 2: Apply standard practices and strategies to design and develop computer-based systems

Course Outcomes:

SE – Sem I

Subject 1: Discrete Structures (210241)

At the end of this course, Students will be able to

CO1. Apply techniques for constructing mathematical proofs and make use of appropriate set operations, propositional logic to solve problems

CO2. Use functions or relation models to interpret associated relationship

CO3. Apply basic counting techniques to solve combinatorial problem

CO4. Use graph concepts as a tool to visualize and solve problems.

CO5. Build a minimum spanning tree for a given graph and to find prefix code for a given tree.

CO6. Apply abstract algebra in coding theory and evaluate the algebraic structures.

Subject 2: Fundamentals of Data Structures (210242)

At the end of this course, Students will be able to

CO1 Demonstrate a detailed understanding of behavior of data structures like array, linked list, stack, and queue by developing programs.

CO2 Analyze and use effective and efficient data structures in solving various Computer Engineering domain problems.

CO3 Design the algorithms to solve the programming problems

CO4 Implement various kinds of searching and sorting techniques, and know when to choose which technique

CO5 Compare different representations of linear data structures and to identify the advantages and disadvantages of each.

CO6 Use features of object oriented and structured programming as per requirements of an algorithm to implement and test it

Subject 3: Object Oriented Programming (210243)

CO1 Apply Object Oriented Programming concepts to solve various computing problems

CO2 Design a class using object oriented features like inheritance, data abstraction, encapsulation, and polymorphism

CO3 Design an application using the concept of Compile time and Runtime Polymorphism

CO4 Make use of suitable methods for storing and retrieving data from files.

CO5 Design an application using generic programming and exception handling.

Subject 4: Computer Graphics (210244)

CO1. Explain basic concepts of computer graphics to generate line ,circle & polygon

CO2. Use polygon filling and polygon clipping algorithms

CO3. Apply geometric transformations on 2D and 3D objects

CO4. Explain illumination, color models and shading algorithms

CO5 Design graphical applications using Curves and Fractals

CO6. Use different techniques and tools to create animation

Subject 5: OOPCG Lab (210247)

CO1 **Apply Object Oriented Programming features like inheritance, data abstraction, encapsulation, and polymorphism to solve various computing problems**

CO2 **Make use of suitable methods for storing and retrieving data from files to develop an application**

CO3 **Design an application using generic programming and exception handling**

CO4 **Implement various algorithms for scan conversion and filling & clipping of polygon**

CO5 **Apply geometric transformations on 2D and 3D objects**

CO6 **Design and develop graphical applications using Curves, Fractals and animation techniques**

Subject 6: Digital Electronics and Logic Design (210245)

CO1 **Make use of minimization techniques to solve Boolean Expressions specifications.**

CO2 **Design and implement combinational circuits using ICs, breadboard etc. as per given specifications**

CO3 **Design and implement sequential circuits using ICs, breadboard etc. as per given specifications**

CO4 **Design combinational and sequential circuits using ASM , PLD**

CO5 **Describe characteristics of digital ICs, TTL and CMOS devices.**

CO6 **Explain organization and architecture of Computer System**

Subject 7: Business Communication skills (210249)

At the end of this course, Students will be able to

CO1 **Develop effective verbal/ oral communication skills and improve listening skills**

CO2 **Create precise reports, letters, resume and emails**

CO3 **Develop skills required for group discussion/ meetings/ interviews and presentations**

CO4 **Inspect goal/ target settings, self motivation and practice creative thinking**

CO5 **Adapt in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership qualities**

Subject 8: Humanities and Social Science (210250)

At the end of this course, Students will be able to

CO1 **Outline of the various issues concerning humans and society.**

CO2 **Interpret about their responsibilities towards society.**

CO3 **Interpret issues regarding the social, cultural, economic and human aspects, involved in social changes**

CO4 **Illustrate the nature of the individual and the relationship between self and the community.**

CO5 **Illustrate major ideas, values, beliefs, and experiences that have shaped human history and cultures.**

SE – Sem II

Subject 1: Engineering Mathematics – III (207003)

At the end of this course, Students will be able to

CO1 **Evaluate General solution of higher-order linear differential equation with constant coefficient using different Methods.**

CO2 **Find Fourier transform & Inverse Fourier Transform for different functions. Find Z-Transform using Definition & properties of different sequences**

CO3 **Understand the different techniques of statistical Analysis. Use of probability and probability distribution.**

CO4 **Solve Algebraic and Transcendental equation and system of linear equations using numerical techniques.**

CO5 **Obtain interpolating polynomials, numerical differentiation and integration, numerical solutions of ordinary differential equations used in modern scientific computing**

Subject 2: Data Structures and Algorithms (210252)

CO1 **Describe the abstract properties of various data structures such as stacks, queues, lists, trees, graphs and hash tables**

CO2 **Identify and articulate the complexity goals and benefits of a good hashing scheme for real world applications.**

CO3 **Apply non-linear data structures for solving problems of various domain**

CO4 **Design an algorithm to solve a given problem using suitable data structure and analyze it and determine its efficiency.**

CO5 **Use efficient indexing methods and multiway search techniques to store and maintain data and use different file organization techniques**

CO6 **Design and specify the operations of a nonlinear-based abstract data type and implement them in a high-level programming language.**

Subject 3: Software Engineering (210253)

CO1 **Identify and apply process model for software development**

CO2 **Analyze and model software requirements for given application**

CO3 **Determine software project scheduling and estimation**

CO4 **Design and model a given software system**

CO5 **Identify and handle risk management and software configuration management**

CO6 **Design test cases for software system using verification and validation approaches**

Subject 4: Microprocessor (210254)

CO1 **Develop an application using programming model and instruction set of 80386DX**

CO2 **Illustrate advanced features and bus cycles of 80386 Microprocessor**

CO3 **Make use of memory management features of 80386DX**

CO4 **Analyze need of protection for 80386DX**

CO5 **Explain multitasking and virtual mode features of 80386DX**

CO6 **Explain interrupts mechanism and compare Microprocessors and Microcontrollers**

Subject 5: Principles of Programming Languages (210245)

CO1 **Explain the features and paradigm of different programming languages**

CO2 **Develop an application using object oriented approach**

CO3 **Develop an application using multithreading in Java**

CO4 **Demonstrate logical and functional programming paradigm**

CO5 **Analyze the strength and weaknesses of programming language for efficient and effective program development**

Subject 6: Project Based Learning II (210258)

CO1 **Identify the real life problem from societal need point of view**

CO2 **Choose and compare alternative approaches to select most feasible one**

CO3 **Analyze and synthesize the identified problem from technological perspective**

CO4 **Design the reliable and scalable solution to meet challenges**

CO5 **Demonstrate collaboration and communication skills**

CO6 **Inculcate long life learning attitude towards the societal problems**

Subject 7: Code of Conduct (210259)

CO1 **Interpret the basic perception of profession, professional ethics, various moral and social issues, industrial standards, code of ethics and role of professional ethics in engineering field.**

CO2 **Analyze professional rights and responsibilities of an engineer, responsibilities of an engineer for safety and risk benefit analysis.**

CO3 **Identify the impact of the professional Engineering solutions in societal and Environmental contexts, and demonstrate the knowledge of, and need for sustainable development.**

CO4 **Develop 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**

TE – Sem I

Subject 1: Database Management Systems (310241)

At the end of this course, Students will be able to

CO310241 .1	Create logical design of a database for a given application using ER-Model
CO310241.2	Design and implement a database for a real life application and formulate queries using SQL & PL/SQL
CO310241 .3	apply normalization technique for efficient database design
CO310241.4	Illustrate the need of protocols for Concurrency Control and recovery for transaction management
CO310241.5	Classify NOSQL data models and make use of MangoDB
CO310241 .6	Define Complex data types and Object-oriented databases

Subject 2: **Theory of Computation (310242)**

CO310242.1 Design finite automata and its variants using formal language and translation logic

CO310242.2 Construct regular expression to represent regular language and explain pumping lemma for RE

CO310242.3 Design Context Free Grammars, identify ambiguity and translate given grammar from one form to another

CO310242.4 Construct Pushdown Automaton model for the Context Free language

CO310242.5 Design Turing Machine model for regular and nonregular languages

CO310242.6 Analyze given problem for undecidability and computational complexity

Subject 3: **System Programming and Operating System (310243)**

CO310243.1 Design and Implement Assembler using suitable data structures.

CO310243.2 Design & Implement Macro-processor using suitable data structures.

CO310243.3 Explain functionalities of Linker and Loaders.

CO310243.4 Illustrate process scheduling algorithms.

CO310243.5 Explain deadlock detection, prevention, avoidance.

CO310243.6 Describe memory management techniques.

Subject 4: Computer Networks and Security (310244)

CO310244.1	Summarize fundamental concepts of Computer Networks, architectures, protocols and technologies
CO310244.2	Illustrate design issues of data link layer and different techniques for framing, error control, flow control and routing
CO310244.3	Analyze the working of different routing protocols and mechanisms
CO310244.4	Implement Client-server applications using sockets
CO310244.5	Illustrate Role Of application layer with its protocols,client-server architectures
CO310244.6	Summarize principle concepts, basic approaches in NetworkSecurity

Subject 5: Computer Networks and Security Lab (310247)

CO310247.1	Develop wired LAN and configure machines with IPs
CO310247.2	Demonstrate error control flow control techniques and protocols and analyze them
CO310247.3	Demonstrate the subnet formation with IP allocation mechanism and apply various routing algorithms
CO310247.4	Develop network applications using socket programming
CO310247.5	Construct web applications and services using application layer protocols
CO310247.6	Illustrate network security services and mechanisms

Subject 6: Elective I: Software Project Management (310245(D))

310245(D).1	Understand the fundamentals of Software Project Management
310245(D).2	Investigate software project planning and management tools
310245(D).3	Learn software project scheduling and tracking
310245(D).4	Discuss about the agile project management
310245(D).5	Analyse the same project using Agile.
310245(D).6	Know people management in software project

Subject 7: Laboratory Practice I (310248)

CO310248.1	Design assembler and macroprocessor by using various needed data structures.
CO310248.2	Implement process scheduling algorithms
CO310248.3	Demonstrate page replacement policies
CO310248.4	Apply various IoT protocols for communication between different endpoints to develop client server application/ Apply socket programming for developing Inter process communication application/ Apply Software Project Management tools for system
CO310248.5	Design and construct IoT applications for specified requirement / Design and construct real time applications using the principles of Distributed Systems / Create software project plan and schedule
CO310248.6	Design and develop secured cloud IoT applications/ Design, build and test application programs on Distributed Systems/ Design and analyse software design document for software project

Subject 8: Seminar and Technical Education (310249)

CO310249.1	Analyze a latest topic of professional interest
CO310249.2	Enhance technical writting skills
CO310249.3	Identify an Engineering problem,analyze it and propose a work plan to solve it
CO310249.4	Communicate with professional technical presentation skills

TE – Sem II

Subject 1: Data Science and Big Data Analytics (310251)

At the end of this course, Students will be able to

CO310251.1	Explain needs and challenges of Data Science and Big Data Analytics
CO310251.2	Apply statistical methods for Data representation and exploration
CO310251.3	Explain application of Big Data analytics lifecycle to solve real world problems
CO310251.4	Implement Big Data Analytics algorithms using Python programming
CO310251.5	Implement text pre-processing and apply data modelling strategies
CO310251.6	Implement data visualization techniques using Python programming and Big Databases using the Hadoop ecosystem

Subject 2: Web Technology (310252)

CO310252.1	Design websites by employing basic web designing elements using HTML, CSS.
CO310252.2	Apply Javascript and Jquery to validate client side scripting.
CO310252.3	Prepare server side web application using Java Servlets and XML
CO310252.4	Understand the concept of JSP and web services.
CO310252.5	Construct server side web applications using PHP, MySQL and ASP.NET
CO310252.6	Understand dynamic web page development using latest web development platforms.

Subject 3: Artificial Intelligence (310253)

CO310253.1	Decide the type of agent for a given application.
CO310253.2	Design smart systems using different informed, uninformed search or heuristic approaches.
CO310253.3	Represent knowledge by ontological engineering to plan a strategy to solve a given problem.
CO310253.4	Choose an appropriate Adversarial search method for a given problem.
CO310253.5	Apply knowledge based reasoning to solve the given problem.
CO310253.6	Identify a planning strategy for a given problem.

Subject 4: Elective II: Information Security (310254)

CO310254.1	Analyze principle concepts, basic approaches in information and network security.
CO310254.2	Interpret standard algorithms and protocols employed to provide confidentiality, integrity and authenticity.
CO310254.3	Apply cryptographic techniques by illustrating the use of symmetric key and asymmetric key cryptography
CO310254.4	Design and analyze web security solutions by deploying various cryptographic techniques along with data integrity algorithms
CO310254.5	Identify and Evaluate network and system Security threats
CO310254.6	Demonstrate the use of standards and cyber laws to enhance Information Security in the development process and infrastructure protection

Subject 5: Elective II: Cloud Computing (310254)

CO310254(C).1 Identify different cloud computing environments and architecture.

CO310254(C).2 Use appropriate data storage techniques on Cloud, based on Cloud application.

CO310254(C).3 Describe the principles of virtualization technologies and cloud computing.

CO310254(C).4 Develop and deploy applications on Cloud.

CO310254(C).5 Apply security in cloud applications.

CO310254(C).6 Explore future trends of cloud computing.

Subject 6 Laboratory Practice II (310258)

CO310258.1 Design a system using informed or uninformed search techniques.

CO310258.2 Develop an expert system for real life application.

CO310258.3 Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.

CO310258.4 Implement cryptographic technique for problem solving./ Use cloud computing services for problem solving.

CO310258.5 Demonstrate tools and techniques in the area of Information Security./Use tools and techniques in the area of cloud computing.

CO310258.6 Design and develop security solution./Design and develop applications on cloud.

Subject 7 Web Technology Lab (310257)

CO310257.1	Create web pages using HTML, CSS and XML.
CO310257.2	Develop dynamic web pages using JavaScript.
CO310257.3	Apply Servlet and JSP concepts to create dynamic web application and store data in database.
CO310257.4	Develop solution to complex problems using appropriate method, technologies, frameworks, web services and content management

BE – Sem I

Subject 1: Design and Analysis of Algorithms (410241)

At the end of this course, students will be able to

CO1: Formulate the problem

CO2: Analyze the asymptotic performance of algorithms

CO3: Decide and **apply** algorithmic strategies to solve given problem

CO4: Find optimal solution by applying various methods

CO5: Analyze and **Apply** Scheduling and Sorting Algorithms.

CO6: Solve problems for multi-core or distributed or concurrent environments

Subject 2: Machine Learning (410242)

CO1: Identify the needs and challenges of machine learning for real time applications.

CO2: Apply various data pre-processing techniques to simplify and speed up machine learning algorithms.

CO3: Select and apply appropriately supervised machine learning algorithms for real time applications.

CO4: Implement variants of multi-class classifiers and measure its performance.

CO5 :Compare and contrast different clustering algorithms.

CO6: Design a neural network for solving engineering problems.

Subject 3: Blockchain Technology (410243)

CO1: Interpret the fundamentals and basic concepts in Blockchain

CO2: Compare the working of different blockchain platforms

CO3: Use Crypto wallet for cryptocurrency based transactions

CO4: Analyze the importance of blockchain in finding the solution to the real-world problems.

CO5: Illustrate the Ethereum public block chain platform

CO6: Identify relative applications where block chain technology can be effectively used and implemented.

Subject 4: Elective III Pervasive Computing 410244(A)

CO1. Demonstrate fundamental concepts in pervasive computing.

CO2. Explain pervasive devices and decide appropriate one as per the need of real time applications.

CO3. Classify and analyze context aware systems for their efficiency in different ICT systems.

CO4. Illustrate intelligent systems and generic intelligent interactive applications.

CO5. Design HCI systems in a pervasive computing environment.

CO6.Explore the security challenges and know the role of ethics in the context of pervasive computing.

Subject 5: Elective III Multimedia Techniques 410244(B)

CO1: Describe the media and supporting devices commonly associated with multimedia information and systems.

CO2: Demonstrate the use of content-based information analysis in a multimedia information system.

CO3: Critique multimedia presentations in terms of their appropriate use of audio, video, graphics, color,and other information presentation concepts.

CO4: Implement a multimedia application using an authoring system.

CO5: Understanding of technologies for tracking, navigation and gestural control.

CO6: Implement Multimedia Internet of Things Architectures.

Subject 6: Elective III Cyber Security and Digital Forensics 410244(C)

CO1: Analyze threats in order to protect or defend it in cyberspace from cyber-attacks.

CO2: Build appropriate security solutions against cyber-attacks.

CO3: Underline the need of digital forensic and the role of digital evidence.

CO4: Explain rules and types of evidence collection

CO5: Analyze, validate and process crime scenes

CO6: Identify the methods to generate legal evidence and supporting investigation reports.

Subject 7: Elective III Object oriented Modeling and Design 410244(D)

CO1: Describe the concepts of object-oriented and basic class modeling.

CO2: Draw class diagrams, sequence diagrams and interaction diagrams to solve problems.

CO3: Choose and apply a befitting design pattern for the given problem

CO4: To Analyze applications, architectural Styles & software control strategies

CO5: To develop Class design Models & choose Legacy Systems.

CO6: To Understand Design Patterns

Subject 8: Elective III Digital Signal Processing 410244(E)

CO1: Understand the mathematical models and representations of DT Signals and Systems

CO2: Apply different transforms like Fourier and Z-Transform from applications point of view.

CO3: Understand the design and implementation of DT systems as DT filters with filter structures and different transforms.

CO4: Demonstrate the knowledge of signals and systems for design and analysis of systems

CO5: Apply knowledge and use the signal transforms for digital processing applications

CO6: To understand Filtering and Different Filter Structures

Subject 9: Elective IV Information Retrieval 410245(A)

CO1: Implement the concept of Information Retrieval

CO2:Generate quality information out of retrieved information

CO3:Apply techniques such as classification, clustering, and filtering over multimedia to analyzethe information

CO4: Evaluate and analyze retrieved information

CO5: Understand the data in various Application and Extensions of information retrieval

CO6: Understand Parallel information retrieving and web structure.

Subject 10 Elective IV GPU Programming and Architecture 410245(B)

CO1: Describe GPU architecture

CO2: Write programs using CUDA, identify issues and debug them.

CO3: Implement efficient algorithms in GPUs for common application kernels, such as matrix multiplication

CO4: Write simple programs using OpenCL

CO5: Identify efficient parallel programming patterns to solve problems

CO6: Explore the modern GPUs architecture and it‘s Applications.

Subject 11 Elective IV Mobile Computing 410245(C)

CO1: Develop a strong grounding in the fundamentals of mobile Networks

CO2: Apply knowledge in MAC, Network, and Transport Layer protocols ofWireless Network

CO3: Illustrate Global System for Mobile Communications

CO4: Use the 3G/4G technology based network with bandwidth capacity planning,VLR and HLR identification algorithms

CO5: Classify network and transport layer of mobile communication

CO6: Design & development of various wireless network protocols using simulation tools

Subject 12Elective IV Software Testing and Quality Assurance 410245(D)

CO1: Describe fundamental concepts in software testing such as manual testing, automation testing and software quality assurance.

CO2: Design and Develop project test plan, design test cases, test data, and conduct test operations.

CO3: Apply recent automation tools for various software testing for testing software.

CO4: Apply different approaches of quality management, assurance, and quality standard to software systems.

CO5: Apply and analyze effectiveness Software Quality Tools.

CO6: Apply tools necessary for an efficient testing framework.

Subject 13 Elective IV Compilers 410245(E)

CO1: Design and implement a lexical analyzer using LEX tools

CO2: Design and implement a syntax analyzer using YACC tools

CO3: Understand syntax-directed translation and run-time environment

CO4 : Generate intermediate codes for high-level statements.

CO5 :Construct algorithms to produce computer code.

CO6: Analyze and transform programs to improve their time and memory efficiency

Subject 14 Laboratory Practice III (410246)

CO1: Apply preprocessing techniques on datasets.

CO2: Implement and evaluate linear regression and random forest regression models.

CO3: Apply and evaluate classification and clustering techniques.

CO4: Analyze performance of an algorithm.

CO5: Implement an algorithm that follows one of the following algorithm design strategies: divide and conquer, greedy, dynamic programming, backtracking, branch and bound.

CO6: Interpret the basic concepts in Blockchain technology and its applications

Subject 15 Laboratory Practice IV (410247)

CO1: Apply android application development for solving real life problems
CO2: Design and develop system using various multimedia components.
CO3: Identify various vulnerabilities and demonstrate using various tools.
CO4: Apply information retrieval tools for natural language processing
CO5: Develop an application using open source GPU programming languages
CO6: Apply software testing tools to perform automated testing

Subject 15 Project Work Stage I (410248)

CO1. Solve real life problems by applying knowledge.
CO2. Analyze alternative approaches, apply and use the most appropriate one for a feasible solution.
CO3. Write precise reports and technical documents in a nutshell.
CO4. Participate effectively in multi-disciplinary and heterogeneous teams exhibiting teamwork
CO5. Inter-personal relationships, conflict management and leadership quality.

BE – Sem II

Subject 1: High Performance Computing (410250)

At the end of this course, Students will be able to
CO1: Understand various Parallel Paradigm
CO2: Design and Develop an efficient parallel algorithm to solve given problem
CO3: Illustrate data communication operations on various parallel architecture
CO4: Analyze and measure performance of modern parallel computing systems
CO5: Apply CUDA architecture for parallel programming
CO6: Analyze the performance of HPC applications

Subject 2: Deep Learning (410251)

CO1: Understand the basics of Deep Learning and apply the tools to implement deep learning applications
CO2: Evaluate the performance of deep learning models (e.g., with respect to the bias-variance trade-off, overfitting and underfitting, estimation of test error).
CO3: To apply the technique of Convolution (CNN) and Recurrent Neural Network (RNN) for implementing Deep Learning models
CO4: To implement and apply deep generative models.
CO5: Construct and apply on-policy reinforcement learning algorithms
CO6: To Understand Reinforcement Learning Process

Subject 3: Elective V Natural Language Processing 410252(A)

CO1: Describe the fundamental concepts of NLP, challenges and issues in NLP

CO2: Analyze Natural languages morphologically, syntactical and semantically OR Describe the concepts of morphology, syntax, semantics of natural language

CO3: Illustrate various language modeling techniques

CO4: Integrate the NLP techniques for the information retrieval task

CO5: Demonstrate the use of NLP tools and techniques for text-based processing of natural languages

CO6: Develop real world NLP applications

Subject 4: Elective V Image Processing 410252(B)

CO1: Apply Relevant Mathematics Required for Digital Image Processing.

CO2: Apply Special and Frequency Domain Method for Image Enhancement.

CO3: Apply algorithmic approaches for Image segmentation.

CO4: Summarize the Concept of Image Compression and Object Recognition.

CO5: Explore the Image Restoration Techniques.

CO6: Explore the Medical and Satellite Image Processing Applications.

Subject 5: Elective V Software Defined Networks 410252(C)

CO1: Interpret the need of Software Defined networking solutions.

CO2: Analyze different methodologies for sustainable Software Defined Networking Solutions.

CO3: Select best practices for design, deployment and troubleshoot of next generation networks.

CO4: Develop programmability of network elements.

CO5: Demonstrate virtualization and SDN Controllers using OpenFlow protocol

CO6: Design and develop various applications of SDN

Subject 6: Elective V Advanced Digital Signal Processing 410252(D)

CO1: Understand and apply different transforms for the design of DT/Digital systems

CO2: Explore the knowledge of adaptive filtering and Multi-rate DSP

CO3: Design DT systems in the field/area of adaptive filtering, spectral estimation and multi-rateDSP

CO4: Explore use of DCT and WT in speech and image processing

CO5: Develop algorithms in the field of speech , image processing and other DSP applications

CO6:Identify Image Processing Techniques

Subject 7: Elective VI Pattern Recognition 410253(A)

CO1: Analyze various type of pattern recognition techniques

CO2: Identify and apply various pattern recognition and classification approaches to solve the problems

CO3: Evaluate statistical and structural pattern recognition

CO4: Percept recent advances in pattern recognition confined to various applications

CO5:Implement Bellman‘s optimality principle and dynamic programming

CO6:Analyze Patterns using Genetic Algorithms & Pattern recognition applications.

Subject 8: Elective VI Soft Computing 410253(B)

CO1: Understand requirements of soft computing and be aware of various soft computing techniques.

CO2: Understand Artificial Neural Network and its characteristics and implement ANN algorithms.

CO3: Understand and Implement Evolutionary Computing Techniques.

CO4: Understand the Fuzzy logic and Implement fuzzy algorithms for solving real life problems.

CO5: Apply knowledge of Genetic algorithms for problem solving.

CO6: Develop hybrid systems for problem solving.

Subject 9: Elective VI Business Intelligence 410253(C)

CO1: Differentiate the concepts of Decision Support System & Business Intelligence

CO2: Use Data Warehouse & Business Architecture to design a BI system.

CO3:Build graphical reports

CO4:Apply different data preprocessing techniques on dataset

CO5:implement machine learning algorithms as per business needs

CO6: Identify role of BI in marketing, logistics, and finance and telecommunication sector

Subject 10: Elective VI Quantum Computing 410253(D)

CO1: To understand the concepts of Quantum Computing

CO2: To understand and get exposure to mathematical foundation and quantum mechanics

CO3: To understand and implement building blocks of Quantum circuits

CO4: To understand quantum information, its processing and Simulation tools

CO5: To understand basic signal processing algorithms FT, DFT and FFT

CO6 : To study and solve examples of Quantum Fourier Transforms and their applications

Subject 11: 410255: Laboratory Practice V

CO1: Analyze and measure performance of sequential and parallel algorithms.

CO2: Design and Implement solutions for multicore/Distributed/parallel environment.

CO3: Identify and apply the suitable algorithms to solve AI/ML problems.

CO4: Apply the technique of Deep Neural network for implementing Linear regression and classification.

CO5: Apply the technique of Convolution (CNN) for implementing Deep Learning models.

CO6: Design and develop Recurrent Neural Network (RNN) for prediction.

Subject 12: 410256: Laboratory Practice VI

CO1: Apply basic principles of elective subjects to problem solving and modeling.

CO2: Use tools and techniques in the area of software development to build mini projects

CO3: Design and develop applications on subjects of their choice.

CO4: Generate and manage deployment, administration & security.

Subject 13: 410257: Project Work Stage II

CO1: Show evidence of independent investigation

CO2: Critically analyze the results and their interpretation.

CO3: Report and present the original results in an orderly way and placing the open questions in the right perspective.

CO4: Link techniques and results from literature as well as actual research and future research lines with the research.

CO5: Appreciate practical implications and constraints of the specialist subject