

Computer Engineering

Course Objective & Course Outcome

Sub: Discrete Mathematics (210241)

CO No.	Course Objective	Course Outcome
1	To introduce students to understand, explain, and apply the foundational mathematical concepts at the core of computer science.	Formulate problems precisely, solve the problems, apply formal proof techniques, and explain the reasoning clearly.
2	To understand use of set, function and relation models to understand practical examples, and interpret the associated operations and terminologies in context.	Apply appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations including those in real-life contexts.
3	To acquire knowledge of logic and proof techniques to expand mathematical maturity.	Design and analyse real world engineering problems by applying set theory, propositional logic and to construct proofs using mathematical induction.
4	To learn the fundamental counting principle, permutations, and combinations.	Specify, manipulate and apply equivalence relations; construct and use functions and apply these concepts to solve new problems.
5	To study how to model problem using graph and tree.	Calculate numbers of possible outcomes using permutations and combinations; to model and analyze computational processes using combinatorics.
6	To learn how abstract algebra is used in coding theory.	Model and solve computing problem using tree and graph and solve problems using appropriate algorithms.
7		Analyze the properties of binary operations, apply abstract algebra in coding theory and evaluate the algebraic structures.

Sub: Fundamentals of Data Structures (210242)

CO No.	Course Objective	Course Outcome
1	To understand the standard and abstract data representation methods	Design the algorithms to solve the programming problems, identify appropriate algorithmic strategy for specific application, and analyze the time and space complexity.
2	To acquaint with the structural constraints and advantages in usage of the data.	Discriminate the usage of various structures, Design/Program/Implement the appropriate data structures; use them in implementations of abstract data types and Identity the appropriate data structure in approaching the problem solution.
3	To understand various data structures, operations on it and the memory requirements	Demonstrate use of sequential data structures- Array and Linked lists to store and process data.
4	To understand various data searching and sorting methods.	Understand the computational efficiency of the principal algorithms for searching and sorting and choose the most efficient one for the application.
5	To understand various algorithmic strategies to approach the problem solution.	Compare and contrast different implementations of data structures (dynamic and static).
6		Understand, Implement and apply principles of data structures-stack and queue to solve computational problems.

Sub: Object Oriented Programming (210243)

CO No.	Course Objective	Course Outcome
1	To learn the object-oriented programming paradigm, focusing on the definition and use of classes along with the fundamentals of object-oriented design	Apply constructs- sequence, selection and iteration; classes and objects, inheritance, use of predefined classes from libraries while developing software.
2	To learn the syntax and semantics of the C++ programming language.	Design object-oriented solutions for small systems involving multiple objects.
3	To understand the concept of data abstraction and encapsulation, how to design C++ classes for code reuse, how to implement copy constructors and class member functions, to overload functions and operators in C++.	Use virtual and pure virtual function and complex programming situations.
4	To learn how inheritance and virtual functions implement dynamic binding with polymorphism.	Apply object-oriented software principles in problem solving.
5	To learn how to design and implement generic classes with C++ templates and how to use exception handling in C++ programs.	Analyze the strengths of object-oriented programming.
6		Develop the application using object oriented programming language (C++).

Sub: Computer Graphics(210244)

CO No.	Course Objective	Course Outcome
1	Remembering: To acquaint the learner with the basic concepts of Computer Graphics.	Identify the basic terminologies of Computer Graphics and interpret the mathematical foundation of the concepts of computer graphics.
2	Understanding: To learn the various algorithms for generating and rendering graphical figures.	Apply mathematics to develop Computer programs for elementary graphic operations.
3	Applying: To get familiar with mathematics behind the graphical transformations.	Illustrate the concepts of windowing and clipping and apply various algorithms to fill and clip polygons.
4	Understanding: To understand and apply various methods and techniques regarding projections, animation, shading, illumination and lighting.	Understand and apply the core concepts of computer graphics, including transformation in two and three dimensions, viewing and projection..
5	Creating: To generate Interactive graphics using OpenGL.	Understand the concepts of color models, lighting, shading models and hidden surface elimination.
6		Create effective programs using concepts of curves, fractals, animation and gaming.

Sub: Digital Electronics and Logic Design(210245)

CO No.	Course Objective	Course Outcome
1	To study number systems and develop skills for design and implementation of combinational logic circuits and sequential circuits	Simplify Boolean Expressions using K Map.
2	To understand the functionalities, properties and applicability of Logic Families.	Design and implement combinational circuits
3	To introduce programmable logic devices and ASM chart and synchronous state machines	Design and implement sequential circuits.
4	To introduce students to basics of microprocessor.	Develop simple real-world application using ASM and PLD.
5		Differentiate and Choose appropriate logic families IC packages as per the given design specifications.
6		Explain organization and architecture of computer system

Sub: Data Structure Laboratory(210246)

CO No.	Course Objective	Course Outcome
1	To understand basic techniques and strategies of algorithm analysis, the memory requirement for various data structures like array, linked list, stack, queue etc using concepts of python and C++ programming language.	Use algorithms on various linear data structure using sequential organization to solve real life problems
2		Analyze problems to apply suitable searching and sorting algorithm to various applications.
3		Analyze problems to use variants of linked list and solve various real life problems.
4		Designing and implement data structures and algorithms for solving different kinds of problems.

Sub: OOP and Computer Graphics Laboratory(210247)

CO No.	Course Objective	Course Outcome
1	To understand basics of Computer Graphics, apply various methods and techniques for implementing line- circle drawing, projections, animation, shading, illumination and lighting using concepts of Object Oriented Programming.	Understand and apply the concepts like inheritance, polymorphism, exception handling and generic structures for implementing reusable programming codes.
2		Analyze the concept of file and apply it while storing and retrieving the data from secondary storages.
3		Analyze and apply computer graphics algorithms for line-circle drawing, scan conversion and filling with the help of object oriented programming concepts.
4		Understand the concept of windowing and clipping and apply various algorithms to fill and clip polygons.
5		Apply logic to implement, curves, fractals, animation and gaming programs.

Sub: Digital Electronics Laboratory(210248)

CO No.	Course Objective	Course Outcome
1	To understand fundamentals and functionality of electronic circuits, design and implement combinational circuits like MUX, comparator, adder/subtractor, design and implement sequential circuits like flip-flop, registers, and counters using different integrated circuits.	Understand the working of digital electronic circuits.
2		Apply the knowledge to appropriate IC as per the design specifications.
3		Design and implement Sequential and Combinational digital circuits as per the specifications.

Sub: Business Communication Skills(210249)

CO No.	Course Objective	Course Outcome
1	To facilitate Holistic growth	Express effectively through verbal/oral communication and improve listening skills
2	To make the engineering students aware, about the importance, the role and the content of business communication skills	Write precise briefs or reports and technical documents.
3	To develop the ability of effective communication through individual and group activities	Prepare for group discussion / meetings / interviews and presentations.
4	To expose students to right attitudinal and behavioural aspects and to build the same through various activities	Explore goal/target setting, self-motivation and practicing creative thinking.
5		Operate effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership qualities.

Sub: Humanity and Social Science (210250)

CO No.	Course Objective	Course Outcome
1	To facilitate Holistic growth	Aware of the various issues concerning humans and society
2	To Educate about Contemporary, National and International affairs	Aware about their responsibilities towards society.
3	To bring awareness about the responsibility towards society	Sensitized about broader issues regarding the social, cultural, economic and human aspects, involved in social changes.
4	To give an insight about the emergence of Indian society and the relevance of Economics	Able to understand the nature of the individual and the relationship between self and the community.
5		Able to understand major ideas, values, beliefs, and experiences that have shaped human history and cultures.

Sub: Audit Course 3 (Smart Cities)(210251)

CO No.	Course Objective	Course Outcome
1	To identify urban problems	Understand the dynamic behaviour of the urban system by going beyond the physical appearance and by focusing on representations, properties and impact factors
2	To study Effective and feasible ways to coordinate urban technologies.	Explore the city as the most complex human-made organism with a metabolism that can be modelled in terms of stocks and flows
3	To study models and methods for effective implementation of Smart Cities.	Knowledge about data-informed approaches for the development of the future city, based on crowd sourcing and sensing.
4	To study new technologies for Communication and Dissemination.	Knowledge about the latest research results in for the development and management of future cities
5	To study new forms of Urban Governance and Organization.	Understand how citizens can benefit from data-informed design to develop smart and responsive cities

Sub: Engineering Mathematics III(207003)

CO No.	Course Objective	Course Outcome
1	To make the students familiar with concepts and techniques in Linear differential equations, Fourier transform and Z-transform, Statistical methods, Probability theory and Numerical methods. The aim is to equip them with the techniques to understand advanced level mathematics and its applications that would enhance thinking power, useful in their disciplines.	Solve Linear differential equations, essential in modelling and design of computer-based systems.
2		Apply concept of Fourier transform and Z-transform and its applications to continuous and discrete systems and image processing.
3		Apply Statistical methods like correlation and regression analysis and probability theory for data analysis and predictions in machine learning.
4		Solve Algebraic and Transcendental equations and System of linear equations using numerical techniques.
5		Obtain Interpolating polynomials, numerical differentiation and integration, numerical solutions of ordinary differential equations used in modern scientific computing.

Sub: Data Structures and Algorithms(210252)

CO No.	Course Objective	Course Outcome
1	To develop a logic for graphical modeling of the real life problems.	Identify and articulate the complexity goals and benefits of a good hashing scheme for real- world applications.
2	To suggest appropriate data structure and	Apply non-linear data structures for solving

	algorithm for graphical solutions of the problems	problems of various domain.
3	To understand advanced data structures to solve complex problems in various domains.	Design and specify the operations of a nonlinear-based abstract data type and implement them in a high-level programming language.
4	To operate on the various structured data	Analyze the algorithmic solutions for resource requirements and optimization
5	To build the logic to use appropriate data structure in logical and computational solutions.	Use efficient indexing methods and multiway search techniques to store and maintain data.
6	To understand various algorithmic strategies to approach the problem solution.	Use appropriate modern tools to understand and analyze the functionalities confined to the secondary storage.

Sub: Software Engineering(210253)

CO No.	Course Objective	Course Outcome
1	To learn and understand the principles of Software Engineering.	Analyze software requirements and formulate design solution for a software.
2	To be acquainted with methods of capturing, specifying, visualizing and analyzing software requirements.	Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns.
3	To apply design and testing principles to software project development.	Apply new software models, techniques and technologies to bring out innovative and novelistic solutions for the growth of the society in all aspects and evolving into their continuous professional development.
4	To understand project management through life cycle of the project.	Model and design User interface and component-level.
5		Identify and handle risk management and software configuration management.
6		Utilize knowledge of software testing approaches, approaches to verification and validation.
7		Construct software of high quality - software that is reliable, and that is reasonably easy to understand, modify and maintain efficient, reliable, robust and cost-effective software solutions.

Sub: Microprocessor (210254)

CO No.	Course Objective	Course Outcome
1	To learn and distinguish the architecture and programmer's model of advanced processor.	Exhibit skill of assembly language programming for the application.
2	To identify the system level features and processes of advanced processors..	Classify Processor architectures.
3	To acquaint the learner with application instruction set and logic to build assembly language programs.	Illustrate advanced features of 80386 Microprocessor.
4		Compare and contrast different processor modes.
5		Use interrupts mechanism in applications
6		Differentiate between Microprocessors and Microcontrollers.

7		Identify and analyze the tools and techniques used to design, implement, and debug microprocessor-based systems.
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Sub: Principles of Programming Languages(210255)

CO No.	Course Objective	Course Outcome
1	To learn basic principles of programming languages and programming paradigms.	Make use of basic principles of programming languages.
2	To learn structuring the data and manipulation of data, computation and program structure.	Develop a program with Data representation and Computations.
3	To learn Object Oriented Programming (OOP) principles using Java Programming Language.	Develop programs using Object Oriented Programming language : Java.
4	To learn basic concepts of logical and functional programming language.	Develop application using inheritance, encapsulation, and polymorphism.
5		Demonstrate Multithreading for robust application development.
6		Develop a simple program using basic concepts of Functional and Logical programming paradigm.

Sub: Data Structures and Algorithms Laboratory(210256)

CO No.	Course Objective	Course Outcome
1	To understand practical implementation and usage of non linear data structures for solving problems of different domain.	Understand the ADT/libraries, hash tables and dictionary to design algorithms for a specific problem.
2	To strengthen the ability to identify and apply the suitable data structure for the given real world problems.	Choose most appropriate data structures and apply algorithms for graphical solutions of the problems.
3	To analyze advanced data structures including hash table, dictionary, trees, graphs, sorting algorithms and file organization.	Apply and analyze non linear data structures to solve real world complex problems.
4		Apply and analyze algorithm design techniques for indexing, sorting, multi-way searching, file organization and compression.
5		Analyze the efficiency of most appropriate data structure for creating efficient solutions for engineering design situations.

Sub: Microprocessor Laboratory(210257)

CO No.	Course Objective	Course Outcome
1	To understand assembly language programming instruction set	Understand and apply various addressing modes and instruction set to implement assembly language programs
2	To understand different assembler directives with	Apply logic to implement code conversion

	example	
3	To apply instruction set for implementing X86/64 bit assembly language programs	Analyze and apply logic to demonstrate processor mode of operation

Sub: Project Based Learning II (210258)

CO No.	Course Objective	Course Outcome
1	To develop critical thinking and problem solving ability by exploring and proposing solutions to realistic/social problem.	Identify the real life problem from societal need point of view
2	To Evaluate alternative approaches, and justify the use of selected tools and methods	Choose and compare alternative approaches to select most feasible one
3	To emphasizes learning activities that are long-term, inter-disciplinary and student-centric.	Analyze and synthesize the identified problem from technological perspective
4	To engages students in rich and authentic learning experiences.	Design the reliable and scalable solution to meet challenges
5	To provide every student the opportunity to get involved either individually or as a group so as to develop team skills and learn professionalism	Evaluate the solution based on the criteria specified
6	To develop an ecosystem that promotes entrepreneurship and research culture among the students.	Inculcate long life learning attitude towards the societal problems

Sub: Code of Conduct (210259)

CO No.	Course Objective	Course Outcome
1	To promote ethics, honesty and professionalism	Understand 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.
2	To set standards that are expected to follow and to be aware that If one acts unethically what are the consequences.	Aware of professional rights and responsibilities of an engineer, responsibilities of an engineer for safety and risk benefit analysis.
3	To provide basic knowledge about engineering Ethics, Variety of moral issues and Moral dilemmas, Professional Ideals and Virtues	Understand the impact of the professional Engineering solutions in societal and Environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
4	To provide basic familiarity about Engineers as responsible Experimenters, Research Ethics, Codes of Ethics, Industrial Standards, Exposure to Safety and Risk, Risk Benefit Analysis	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.
5	To have an idea about the Collegiality and Loyalty, Collective Bargaining, Confidentiality, Occupational Crime, Professional, Employee, Intellectual Property Rights.	

Sub: Audit Course 4-IPR(210260)

CO No.	Course Objective	Course Outcome
1	To encourage research, scholarship, and a spirit of inquiry	Understand the fundamental legal principles related to confidential information, copyright, patents, designs, trademarks and unfair competition
2	To encourage students at all levels to develop	Identify, apply and assess principles of law relating

	patentable technologies	to each of these areas of intellectual property
3	To provide environment to the students of the Institute for creation, protection, and commercialization of intellectual property and to stimulate innovation.	Apply the appropriate ownership rules to intellectual property you have been involved in creating

Sub: Database Management Systems (310241)

CO No.	Course Objective	Course Outcome
1	To understand the fundamental concepts of Database Management Systems	Analyze and design Database Management System using ER model
2	To acquire the knowledge of database query languages and transaction processing	Implement database queries using database languages
3	To understand systematic database design approaches	Normalize the database design using normal forms
4	To acquire the skills to use a powerful, flexible, and scalable general-purpose databases to handle Big Data	Apply Transaction Management concepts in real-time situations
5	To be familiar with advances in databases and applications	Use NoSQL databases for processing unstructured data
6		Differentiate between Complex Data Types and analyze the use of appropriate data types

Sub: Theory of Computation (310242)

CO No.	Course Objective	Course Outcome
1	To introduce the students to basics of Theory of Computation	Understand formal language, translation logic, essentials of translation, alphabets, language representation and apply it to design Finite Automata and its variants
2	To study abstract computing models to provide a formal connection between algorithmic problem solving and the theory of languages	Construct regular expression to present regular language and understand pumping lemma for RE
3	To understand Grammar, Pushdown Automata and Turing Machine for language processing and algorithm design	Design Context Free Grammars and learn to simplify the grammar
4	To learn about the theory of computability and complexity for algorithm design	Construct Pushdown Automaton model for the Context Free Language
5		Devise Turing Machine for the different requirements outlined by theoretical computer science
6		Analyze different classes of problems, and study concepts of NP completeness

Sub: Systems Programming and Operating System (310243)

CO No.	Course Objective	Course Outcome
1	To get acquainted with the basics of System Programming	Analyze and synthesize basic System Software and its functionality
2	To acquire knowledge of data structures used in the design of System Software	Identify suitable data structures and Design & Implement various System Software
3	To be familiar with the format of object modules, the functions of linking, relocation, and loading	Compare different loading schemes and analyze the performance of linker and loader

4	To comprehend the structures and functions of Operating Systems and process management	Implement and Analyze the performance of process scheduling algorithms
5	To deal with concurrency and deadlock in the Operating System	Identify the mechanism to deal with deadlock and concurrency issues
6	To learn and understand memory management of Operating System	Demonstrate memory organization and memory management policies

Sub: Computer Networks and Security (310244)

CO No.	Course Objective	Course Outcome
1	To understand the fundamental concepts of networking standards, protocols and technologies	Summarize fundamental concepts of Computer Networks, architectures, protocols and technologies
2	To learn different techniques for framing, error control, flow control and routing	Illustrate the working and functions of data link layer
3	To learn different layer protocols in the protocol stacks	Analyze the working of different routing protocols and mechanisms
4	To understand modern network architectures with respect to design and performance	Implement client-server applications using sockets
5	To learn the fundamental concepts of Network Security	Illustrate role of application layer with its protocols, client-server architectures
6		Comprehend the basics of Network Security

Sub: Elective I- Internet of Things and Embedded Systems (310245-A)

CO No.	Course Objective	Course Outcome
1	To understand fundamentals of Internet of Things (IoT) and Embedded Systems	Understand the fundamentals and need of Embedded Systems for the Internet of Things
2	To learn advances in Embedded Systems and IoT	Apply IoT enabling technologies for developing IoT systems
3	To learn methodologies for IoT application development	Apply design methodology for designing and implementing IoT applications
4	To learn the IoT protocols, cloud platforms and security issues in IoT	Analyze IoT protocols for making IoT devices communication
5	To learn real world application scenarios of IoT along with its societal and economic impact using case studies and real time examples	Design cloud based IoT systems
6		Design and Develop secured IoT applications

Sub: Database Management Systems Laboratory(310246)

CO No.	Course Objective	Course Outcome
1	To develop Database programming skills	Design E-R Model for given requirements and convert the same into database tables
2	To develop basic Database administration skills	Design schema in appropriate normal form considering actual requirements
3	To develop skills to handle NoSQL database	Implement SQL queries for given requirements, using different SQL concepts
4	To learn, understand and execute process of software application development	Implement PL/SQL Code block for given requirements

5		Implement NoSQL queries using MongoDB
6		Design and develop application considering actual requirements and using database concepts

Sub: Computer Networks and Security Laboratory (310247)

CO No.	Course Objective	Course Outcome
1	To learn computer network hardware and software components	Analyze the requirements of network types, topology and transmission media
2	To learn computer network topologies and types of network	Demonstrate error control, flow control techniques and protocols and analyze them
3	To develop an understanding of various protocols, modern technologies and applications	Demonstrate the subnet formation with IP allocation mechanism and apply various routing algorithms
4	To learn modern tools for network traffic analysis	Develop Client-Server architectures and prototypes
5	To learn network programming	Implement web applications and services using application layer protocols
6		Use network security services and mechanisms

Sub: Laboratory Practice I (310248)

CO No.	Course Objective	Course Outcome
1	To learn system programming tools	Implement language translators
2	To learn modern operating system	Use tools like LEX and YACC
3	To learn various techniques, tools, applications in IoT and Embedded Systems /Human Computer Interface/Distributed Systems/ Software Project Management	Implement internals and functionalities of Operating System
		Design IoT and Embedded Systems based application
		Develop smart applications using IoT
		Develop IoT applications based on cloud environment

Sub: Seminar and Technical Communication (310249)

CO No.	Course Objective	Course Outcome
1	To explore the basic principles of communication (verbal and non-verbal) and active, empathetic listening, speaking and writing techniques	Analyze a latest topic of professional interest
2	To explore the latest technologies	Enhance technical writing skills

3	To enhance the communication skills	Identify an engineering problem, analyze it and propose a work plan to solve it
4	To develop problem analysis skills	Communicate with professional technical presentation skills

Sub: Audit Course 5-A Cyber Security(310250)

CO No.	Course Objective	Course Outcome
1	To motivate students for understanding the various scenarios of cybercrimes	Understand and classify various cybercrimes
2	To increase awareness about the cybercrimes and ways to be more secure in online activities	Understand how criminals plan for the cybercrimes
3	To learn about various methods and tools used in cybercrimes	Apply tools and methods used in cybercrime
4	To analyze the system for various vulnerabilities	Analyze the examples of few case studies of cybercrimes

Sub: Data Science and Big Data Analytics (310251)

CO No.	Course Objective	Course Outcome
1	To understand the need of Data Science and Big Data	Analyze needs and challenges for Data Science Big Data Analytics
2	To understand computational statistics in Data Science	Apply statistics for Big Data Analytics
3	To study and understand the different technologies used for Big Data processing	Apply the lifecycle of Big Data analytics to real world problems
4	To understand and apply data modeling strategies	Implement Big Data Analytics using Python programming
5	To learn Data Analytics using Python programming	Implement data visualization using visualization tools in Python programming
6	To be conversant with advances in analytics	Design and implement Big Databases using the Hadoop ecosystem

Sub: Web Technology (310252)

CO No.	Course Objective	Course Outcome
1	To learn the fundamentals of web essentials and markup languages	Implement and analyze behavior of web pages using HTML and CSS
2	To use the Client side technologies in web development	Apply the client side technologies for web development
3	To use the Server side technologies in web development	Analyze the concepts of Servlet and JSP
4	To understand the web services and frameworks	Analyze the Web services and frameworks
5		Apply the server side technologies for web development

6		Create the effective web applications for business functionalities using latest web development platforms
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Sub: Artificial Intelligence (310253)

CO No.	Course Objective	Course Outcome
1	To understand the concept of Artificial Intelligence (AI) in the form of various Intellectual tasks	Identify and apply suitable Intelligent agents for various AI applications
2	To understand Problem Solving using various peculiar search strategies for AI	Build smart system using different informed search / uninformed search or heuristic approaches
3	To understand multi-agent environment in competitive environment	Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem
4	To acquaint with the fundamentals of knowledge and reasoning	Apply the suitable algorithms to solve AI problems
5	To devise plan of action to achieve goals as a critical part of AI	Implement ideas underlying modern logical inference systems
6	To develop a mind to solve real world problems unconventionally with optimality	Represent complex problems with expressive yet carefully constrained language of representation

Sub: Elective II - Information Security(310254-A)

CO No.	Course Objective	Course Outcome
1	To understand the fundamental approaches, principles and apply these concepts in Information Security	Model the cyber security threats and apply formal procedures to defend the attacks
2	To acquire the knowledge of mathematics for cryptography, understand the concepts of basic cryptography	Apply appropriate cryptographic techniques by learning symmetric and asymmetric key cryptography
3	To learn standard algorithms and protocols employed to provide confidentiality, integrity and authenticity	Design and analyze web security solutions by deploying various cryptographic techniques along with data integrity algorithms
4	To acquire the knowledge of security protocol deployed in web security	Identify and Evaluate Information Security threats and vulnerabilities in Information systems and apply security measures to real time scenarios
5	To study Information Security tools	Demonstrate the use of standards and cyber laws to enhance Information Security in the development process and infrastructure protection

Sub: Internship (310255)

CO No.	Course Objective	Course Outcome
1	To encourage and provide opportunities for students to get professional/personal experience through internships	To demonstrate professional competence through industry internship
2	To learn and understand real life/industrial	To apply knowledge gained through internships to

	situations	complete academic activities in a professional manner
3	To get familiar with various tools and technologies used in industries and their applications	To choose appropriate technology and tools to solve given problem
4	To nurture professional and societal ethics	To demonstrate abilities of a responsible professional and use ethical practices in day to day life.
5	To create awareness of social, economic and administrative considerations in the working environment of industry organizations	Creating network and social circle, and developing relationships with industry people
6		To analyze various career opportunities and decide carrier goals

Sub: Data Science and Big Data Analytics Laboratory(310256)

CO No.	Course Objective	Course Outcome
1	To understand principles of Data Science for the analysis of real time problems	Apply principles of Data Science for the analysis of real time problems
2	To develop in depth understanding and implementation of the key technologies in Data Science and Big Data Analytics	Implement data representation using statistical methods
3	To analyze and demonstrate knowledge of statistical data analysis techniques for decision-making	Implement and evaluate data analytics algorithms
4	To gain practical, hands-on experience with statistics programming languages and Big Data tools	Perform text preprocessing
5		Implement data visualization techniques
6		Use cutting edge tools and technologies to analyze Big Data

Sub: Web Technology Laboratory (310257)

CO No.	Course Objective	Course Outcome
1	To learn the web based development environment	Understand the importance of website planning and website design issues
2	To use client side and server side web technologies	Apply the client side and server side technologies for web application development
3	To design and develop web applications using front end technologies and backend databases	Analyze the web technology languages, frameworks and services
4		Create three tier web based applications

Sub: Laboratory Practice II (310258)

CO No.	Course Objective	Course Outcome
1	To learn and apply various search strategies for AI	Design a system using different informed search / uninformed search or heuristic approaches
2	To Formalize and implement constraints in search problems	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning
3	To understand the concepts of Information	Design and develop an interactive AI application

	Security / Augmented and Virtual Reality/Cloud Computing/Software Modeling and Architectures	
4		Use tools and techniques in the area of Information Security
5		Use the cryptographic techniques for problem solving
6		Design and develop security solution

Sub: Audit Course 6- Digital and Social Media Marketing(310259-A)

CO No.	Course Objective	Course Outcome
1	To understand the importance of digital marketing	Understand the fundamentals and importance of digital marketing
2	To understand the social media and marketing	Use the power of social media for business marketing
3		Analyze the effectiveness of digital marketing and social media over traditional process