



Course Outcomes (COs)

S.E. Information Technology Engineering (2019 Course)

Course Code: 214441

Name of Course: Discrete Mathematics

CO1	Formulate and apply formal proof techniques and solve the problems with logical reasoning.
CO2	Analyze and evaluate the combinatorial problems by using probability theory.
CO3	Apply the concepts of graph theory to devise mathematical models.
CO4	Analyze types of relations and functions to provide solution to computational problems.
CO5	Identify techniques of number theory and its application.
CO6	Identify fundamental algebraic structures

Course Code: 214442

Name of Course: Logic Design & Computer Organization

CO1	Perform basic binary arithmetic & simplify logic expressions
CO2	Grasp the operations of logic ICs and Implement combinational logic functions using ICs.
CO3	Comprehend the operations of basic memory cell types and Implement sequential logic functions using ICs.
CO4	Elucidate the functions & organization of various blocks of CPU
CO5	Understand CPU instruction characteristics, enhancement features of CPU.
CO6	Describe an assortment of memory types (with their characteristics) used in computer systems and basic principle of interfacing input, output devices.

Course Code: 214443

Name of Course: Data Structure & Algorithms

CO1	Perform basic analysis of algorithms with respect to time and space complexity.
CO2	Select appropriate searching and/or sorting techniques in the application development.
CO3	Implement abstract data type (ADT) and data structures for given application
CO4	Design algorithms based on techniques like brute -force, divide and conquer, greedy, etc.
CO5	Apply implement learned algorithm design techniques and data structures to solve problems.
CO6	Design different hashing functions and use files organizations



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Course Code: 214444

Name of Course: Object-Oriented Programming

CO1	Differentiate various programming paradigms.
CO2	Identify classes, objects, methods, and handle object creation, initialization, and Destruction to model real-world problems
CO3	Identify relationship among objects using inheritance and polymorphism principles.
CO4	Handle different types of exceptions and perform generic programming.
CO5	Use of files for persistent data storage for real world application
CO6	Apply appropriate design patterns to provide object-oriented solutions

Course Code: 214445

Name of Course: Basics of Computer Network

CO1	Understand and explain the concepts of communication theory and compare functions of OSI and TCP/IP model.
CO2	Analyze data link layer services, error detection and correction, linear block codes, cyclic Codes, framing and flow control protocols
CO3	Compare different access techniques, channelization and IEEE standards.
CO4	Apply the skills of subnetting, supernetting and routing mechanisms.
CO5	Differentiate IPv4 and IPv6
CO6	Illustrate services and protocols used at transport layer.

Course Code: 207003

Name of Course: Engineering Mathematics III

CO1	Solve Linear differential equations, essential in modelling and design of computer-based systems
CO2	Apply concept of Fourier transform and Z-transform and its applications to continuous and discrete systems and image processing.
CO3	Apply Statistical methods like correlation & regression analysis and probability theory for data analysis and predictions in machine learning.
CO4	Solve Algebraic & Transcendental equations 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.



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Course Code: 214451

Name of Course: Processor Architecture

CO1	Apprehend architecture and memory organization of PIC 18 microcontroller.
CO2	Implement embedded C programming for PIC 18.
CO3	Use concepts of timers and interrupts of PIC 18.
CO4	Demonstrate real life applications using PIC 18.
CO5	Analyze architectural details of ARM processor.

Course Code: 214452

Name of Course: Database Management System

CO1	Apply fundamental elements of database management systems.
CO2	Design ER-models to represent simple database application scenarios.
CO3	Formulate SQL queries on data for relational databases
CO4	Improve the database design by normalization & to incorporate query processing.
CO5	Apply ACID properties for transaction management and concurrency control.
CO6	Analyze various database architectures and technologies.

Course Code: 214453

Name of Course: Computer Graphics

CO1	Apply mathematical and logical aspects for developing elementary graphics operations like scan conversion of points, lines, circle, and apply it for problem solving.
CO2	Employ techniques of geometrical transforms to produce, position and manipulate Objects in 2 dimensional and 3-dimensional space respectively.
CO3	Describe mapping from a world coordinates to device coordinates, clipping, and projections in order to produce 3D images on 2D output device.
CO4	Apply concepts of rendering, shading, animation, curves and fractals using computer graphics tools in design, development and testing of 2D, 3D modeling applications.
CO5	Perceive the concepts of virtual reality.



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Course Code: 214454

Name of Course: Software Engineering

CO1	Classify various software application domains.
CO2	Analyze software requirements by using various modeling techniques.
CO3	Translate the requirement models into design models.
CO4	Apply planning and estimation to any project.
CO5	Use quality attributes and testing principles in software development life cycle.
CO6	Discuss recent trends in Software engineering by using CASE and agile tools.



T.E. Information Technology Engineering (2019 Course)

Course Code: 314441

Name of Course: Theory of Computation

CO1	Construct finite automata and its variants to solve computing problems
CO2	Write regular expressions for the regular languages and finite automata.
CO3	Identify types of grammar, design and simplify Context Free Grammar.
CO4	Construct Pushdown Automata machine for the Context Free Language
CO5	Design and analyze Turing machines for formal languages.
CO6	Understand decidable and undecidable problems, analyze complexity classes.

Course Code: 314442

Name of Course: Operating Systems

CO1	Explain the role of Modern Operating Systems
CO2	Apply the concepts of process and thread scheduling
CO3	Illustrate the concept of process synchronization, mutual exclusion and the deadlock
CO4	Implement the concepts of various memory management techniques.
CO5	Make use of concept of I/O management and File system.
CO6	Understand Importance of System software.

Course Code: 314443

Name of Course: Machine Learning

CO1	Apply basic concepts of machine learning and different types of machine learning algorithms
CO2	Differentiate various regression techniques and evaluate their performance.
CO3	Differentiate various regression techniques and evaluate their performance.
CO4	Illustrate the tree-based and probabilistic machine learning algorithms
CO5	Identify different unsupervised learning algorithms for the related real-world problems.
CO6	Identify different unsupervised learning algorithms for the related real-world problems.



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Course Code: 314444

Name of Course: Human Computer Interaction

CO1	Explain importance of HCI study and principles of user-centered design (UCD) approach.
CO2	Develop understanding of human factors in HCI design
CO3	Develop understanding of models, paradigms, and context of interactions.
CO4	Design effective user-interfaces following a structured and organized UCD process
CO5	Evaluate usability of a user-interface design.
CO6	Apply cognitive models for predicting human-computer-interactions.

Course Code: 314445(D)

Name of Course: Elective -I : Internet of Things

CO1	Discuss fundamentals, architecture and framework of IoT.
CO2	Select suitable sensors and actuators for real time scenarios.
CO3	Justify the significance of protocol for wireless communication and IoT challenges
CO4	Understand the Python programming for development of IoT applications.
CO5	Understand the cloud interfacing technologies.
CO6	Design and Implement realtime IoT applications

Course Code: 314451

Name of Course: Computer Network and Security

CO1	Explain Responsibilities, services offered and protocol used at application layer of network.
CO2	Apply concepts of wireless network and different wireless standards.
CO3	Recognize the Adhoc Network's MAC layer, routing protocol and Sensor network architecture.
CO4	Implement the principal concepts of network security and Understand network security threats, security services, and countermeasures
CO5	Apply basic cryptographic techniques in application development.
CO6	Gain a good comprehension of the landscape of cyber security Vulnerabilities & describe typical threats to modern digital systems.



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Course Code: 314452

Name of Course: Data Science and Big Data Analytics

CO1	Understand Big Data primitives.
CO2	Learn and apply different mathematical models for Big Data.
CO3	Demonstrate Big Data learning skills by developing industry or research applications.
CO4	Analyze and apply each learning model comes from a different algorithmic approach and it will perform differently under different datasets.
CO5	Understand, apply and analyze needs, challenges and techniques for big data visualization.
CO6	Learn different programming platforms for big data analytics.

Course Code: 314453

Name of Course: : Web Application Development

CO1	Develop Static and Dynamic website using technologies like HTML, CSS, Bootstrap.
CO2	Demonstrate the use of web scripting languages.
CO3	Develop web application with Front End & Back End Technologies.
CO4	Develop mobile website using JQuery Mobile.
CO5	Deploy web application on cloud using AWS.

Course Code: 314454

Name of Course: Elective-II- (Cloud Computing)

CO1	Articulate the main concepts, key technologies and fundamentals of cloud computing.
CO2	Understand cloud enabling technologies and virtualization.
CO3	Analyze various cloud programming models and apply them to solve problems on the cloud.
CO4	Explain data storage and major security issues in the cloud.
CO5	Understand trends in ubiquitous cloud and internet of things.
CO6	Explore future trends of cloud computing.



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Course Code: 314455

Name of Course: Internship

CO1	Develop professional competence through industry internship.
CO2	Apply academic knowledge in a personal and professional environment.
CO3	Build the professional network and expose students to future employees.
CO4	Apply professional and societal ethics in their day-to-day life.
CO5	Become a responsible professional having social, economic and administrative considerations.
CO6	Make own career goals and personal aspirations.



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B.E. Information Technology Engineering (2019 Course)

Course Code: 414441

Name of Course: Information Storage and Retrieval

CO1	Understand the concept of Information retrieval and to apply clustering in information retrieval.
CO2	Use an indexing approach for retrieval of text and multimedia data.
CO3	Evaluate performance of information retrieval systems.
CO4	Apply the concepts of multimedia and distributed information retrieval.
CO5	Use appropriate tools in analyzing the web information
CO6	Simulate the working of a search engine and recommender system.

Course Code: 414442

Name of Course: Software Project Management

CO1	Apply the practices and methods for successful Software Project Management
CO2	Create Design and Evaluate Project
CO3	Analyze Project Schedule and calculate Risk Management with help of tools.
CO4	Demonstrate different tools used for Project Tracking, Monitoring & Control.
CO5	Identify Staff Selection Process and the issues related to Staff Management.
CO6	Discuss and use modern tools for Software Project Management.

Course Code:414443

Name of Course: Deep Learning

CO1	Understand the theoretical foundations, algorithms, and methodologies of Deep Learning.
CO2	Apply the concepts of Convolution Neural Networks and use of popular CNN architectures.
CO3	Compare Feed Forward Neural Network and Recurrent Neural Network and learn modeling the time dimension using RNN and LSTM.
CO4	Elaborate unsupervised deep learning algorithms like Autoencoders.
CO5	Explore Representation Learning and Transfer Learning techniques using variants of CNN architecture.
CO6	Evaluate the performance of deep learning algorithms and to provide solution for various real-world applications.



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Course Code: 414444

Name of Course: Elective – III (Mobile Computing)

CO1	Understand the basic concepts of mobile computing, MAC and different multiplexing techniques.
CO2	Understand Protocols, Connection Establishment, Frequency Allocation, Routing of mobile telecommunication system like GSM, GPRS, UMTS.
CO3	understand the Generations of Mobile Communication Technologies
CO4	Learn mobile IP , Adhoc – Network, Reactive Routing protocols, Multicast Routing.
CO5	Obtaining knowledge of transport layer protocol TCP, File System, and different application layer protocols.
CO6	Gain knowledge about different mobile platforms, operating Systems, Software Development Kit, Security Issues

Course Code: 414445

Name of Course: Elective – IV (Wireless Communication)

CO1	Articulate the fundamental concept of cellular system.
CO2	Analyze the fundamentals of cellular systems.
CO3	Illustrate multiple access technique for effective utilization of spectrum.
CO4	Design and analyze the WAP Programming Model in networking environment.
CO5	Learn and understand security issues, challenges and tools in wireless communication.
CO6	Explore the emerging trends and applications in wireless communication

Course Code: 414450

Name of Course: Distributed Systems

CO1	Demonstrate the core concepts of distributed systems.
CO2	Understand the concept of middleware of distributed systems.
CO3	Understand Inter-process communication methods and analyze different coordination algorithms.
CO4	Comprehend the importance of replication to achieve fault tolerance in distributed systems.
CO5	Analyze the design and functioning of existing distributed file systems, distributed multimedia, and distributed web-based systems
CO6	Understand various Recent Trends in distributed systems.



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Course Code: 414451

Name of Course: Elective V (Natural Language Processing)

CO1	Understand and analyze the natural language text and model.
CO2	Analyze the natural language syntactically.
CO3	Analyze and study natural language logically.
CO4	Process the natural language text based on relations and knowledge.
CO5	Evaluate the natural language text using models and apply modeling techniques for automatic document separation and text mining.
CO6	Apply information retrieval techniques.

Course Code: 414452

Name of Course: Elective-VI (Blockchain Technology)

CO1	Understand the concept of cryptography and decentralization.
CO2	Acquire fundamental knowledge of blockchain with issues associated with it.
CO3	Acquire knowledge of Ethereum blockchain platform.
CO4	Understand hyper ledger fabric platform.
CO5	Acquire the knowledge regarding working of tokenization.
CO6	Describe the applications and risk involved.

Course Code: 414453

Name of Course: Startup and Entrepreneurship

CO1	Able to understand key concepts and framework of innovation and start-up ecosystem.
CO2	Gain knowledge of how to develop start up ecosystem, its key components and how to influence and manage dynamics between them and increase the productivity of ecosystem.
CO3	Understand the role of different stakeholders in ecosystem in building and supporting growth of start-ups.
CO4	Have insight into global trend in start-up ecosystem and product development.
CO5	Mapping different start-up ecosystems and developing performance indicators.