I Year & I Semester

Discrete Mathematics

Objectives

- To know the concepts of relations and functions ·
- To distinguish among different normal forms and quantifiers ·
- To solve recurrence relations and permutations & combinations ·
- To know and solve matrices , rank of matrix & characteristic equations ·
- To study the graphs and its types

Outcomes

- To understand the concepts of relations and functions distinguish among normal forms
- To analyze and evaluate the recurrence relations
- To distinguish among various normal forms and predicate calculus
- To solve and know various types of matrices
- To evaluate and solve various types of graphs

Data Structures and Algorithms

Objectives

- To get a clear understanding of various ADT structures.
- To understand how to implement different ADT structures with real-time scenarios.
- To analyze the various data structures with their different implementations.
- To get an idea of applying right models based on the problem domain.
- To realize, and understand how and where to implement modern data structures with Python language.

Outcomes

- Understand various ADT concepts
- Familiar with implementation of ADT models with Python language and understand how to develop ADT for the various real-time problems
- Apply with proper ADT models with problem understanding
- Apply and Analyze right models based on the problem domain
- Evaluate modern data structures with Python language

Python Programming

Objectives

- To acquire programming skills in core Python ·
- To learn Strings and function ·
- To develop object oriented skills in Python ·

- To comprehend various Python Packages ·
- To develop web applications using Django

Outcomes

- Comprehend the programming skills in python and develop applications using conditional branches and loop
- Create python applications with strings and functions
- Understand and implement the Object Oriented Programming paradigm with the concept of objects and classes, Inheritance and polymorphism
- Evaluate the use of Python packages to perform numerical computations and data vizualization
- Design interactive web applications using Django

Data Structures using Python Programming Practical

Objectives

- To understand Stack, Queue and Doubly Linked ADT structures.
- To implement different ADT structures with real-time scenarios.
- To analyze the recursion concepts.
- To apply different sorting and tree techniques.
- To implement modern data structures with Python language.

Outcomes

- Strong understanding in various ADT concepts
- To become a familiar with implementation of ADT models
- Apply sort and tree search algorithms
- Evaluate the different data structure models
- Learn how to develop ADT for the various real-time problems

Data Engineering and Management

Objectives

- To understand Data Management concepts
- To get brief knowledge on Data Modeling
- To analyse the techniques used in Distributed Databases
- To assess Distributed database and Business Modeling
- To get familiar with CRM tools

Outcomes

- Comprehend the Data Management concepts and analyse the relationship with the enterprise
- Analyze Data Modelling concepts and assess its quality
- Understand and implement business modelling techniques
- Evaluate the use of Artificial Intelligence and Machine Learning in CRM

- Develop CRM applications in cloud

Architecture and Frameworks

Objectives

- To understand the basics, benefits and purpose of software architecture
- Understand the quality attributes to fulfil the software requirements and relates the software with an organization
- Explore the design patterns, best practice and paradigms of efficient software development
- Understand the performance and security measures of software architecture
- Enable the developers to advance their carrier in software domain

Outcomes

- Understand, analyze and evaluate the purpose of Software architecture and development methodologies with consideration of risk management.
- Comprehend, apply and evaluate the domain knowledge for software development process and determine the impact of quality attributes
- Understand, track and examine the systematic approach for various software design models with effective document process.
- Illustrate and summarize the functions of orthogonal systems with complexity, design principles and design pattern for software architecture
- Comprehend, analyze and evaluate the performance and security measures for Server, Web and Database applications in order to create the secure software systems for various domain applications.

Operating Systems and UNIX

Objectives

- To understand the basic concepts and functions of operating systems ·
- To understand Processes and Threads ·
- To analyze Scheduling algorithms.
- To understand the concept of Deadlocks.
- To analyze various memory management schemes.
- To understand I/O management and File systems.
- To provide a comprehensive introduction to UNIX operating system and shell programming.

Outcomes

- Analyze various scheduling algorithms.
- Understand deadlock, prevention and avoidance algorithms.
- Compare and contrast various memory management schemes.
- Understand the functionality of file systems.

Data Engineering and Management Practical

Objectives

- To acquire basic scripting knowledge in MongoDB
- To learn CRUD Operation on MongoDB database
- To comprehend MongoDB using DbVisualizer
- To be familiar with Zoho CRM features

Outcomes

- Comprehend the scripting knowledge in MongoDB and perform basic operations in shell prompt.
- Implement, Create, Read, Update and Delete Operations on MongoDB database.
- Analyze MongoDB using DbVisualizer.
- Assess Zoho CRM features for managing the customer relationships.
- Create a customized application in Zoho CRM

Architecture and Frameworks Practical

Objectives

- To understand and implement the basic concepts of Software architecture and its functions.
- To acquire programming skills to develop Implement various technologies and services associated with network protocols along with the challenges of data transfer.
- Implement the importance and functioning of Routing Protocols over communication service.
- To acquire skills to connect two routers and any two switches.
- To comprehend related to SSH protocols and accessing the remote device.

Outcomes

- Comprehend the programming skills of Software architecture tools and packages.
- Understand and implement the user profiles and authentication with recovery mechanism
- Comprehend and evaluate the access control and content representation use of FTP server.
- Understand and implement reading and writing resources for various applications
- Identify and examine the notifications, friends, and follower list of social application protocols.

Operating Systems and Unix Practical

Objectives

- To enable the students to run various UNIX commands.
- To develop and implement the shell scripts on UNIX OS.
- To develop and implement the shell script for GUI processing.
- To implement Inter process communication.
- To implement Deadlock detection algorithm.

- To implement various process scheduling algorithms

Outcomes

- To understand, apply and analyze the concepts and methodology of Unix shell programming.
- To comprehend, impart and apply fundamentals of control structure and script controls.
- To understand, analyses and evaluate the functions, graphical desktop interface and editors.
- To collaborate, apply and review the concepts and methodology of regular expression and advanced gawk
- To comprehend, use and analyze the advance concepts such as alternate shell script, dy and bash scripting

I Year & II Semester

Data Base Management System

Objectives

- To learn the fundamentals of data models and to represent a database system using ER diagrams. ·
- To study SQL and relational database design.
- To understand the internal storage structures using different file and indexing techniques which will help in physical DB design.
- To understand the fundamental concepts of transaction processing - concurrency control techniques and recovery procedures.
- To have an introductory knowledge about the Storage and Query processing Techniques

Outcomes

- Classify the modern and futuristic database applications based on size and complexity
- Map ER model to Relational model to perform database design effectively
- Write queries using normalization criteria and optimize queries
- Compare and contrast various indexing strategies in different database systems
- Appraise how advanced databases differ from traditional databases.

Big Data Analytics

Objectives

- To introduce big data tools & Information Standard formats.
- To understand the basic concepts of big data.
- To learn Hadoop, HDFS and Map Reduce concepts.
- To teach the importance of NoSQL.
- To explore the big data tools such as Hive, HBase and Pig

Outcomes

- To understand, illustrate and evaluate the concepts and techniques of Data Science, Big Data Analytics and its tools
- To collaborate,apply and review the computing for big data in Hadoop, and NoSQL environment.
- To comprehend, implement and review the concepts of data science and big data analytics projects using MapReduce, and MongoDB.
- To understand, use and analyze the concepts of big data analytics projects using HIVE database
- To illustrate, develop and review the concepts of PIG database in Hadoop environment.

Computer Networks

Objectives

- To understand the basic concepts of Transmission Control Protocol/Internet Protocol and associated functions
- Explore to describe the internet architecture and its processes associated with the data transfer and to provide the quality of service
- To understand technologies and services associated with network protocols along along with the challenges of dat transfer.
- Learners will understand the importance and functioning of Routing Protocols over communication service.
- Empower the learners to comprehend and manage the issues associated with IP protocols like data traffic problems, security and mobility.

Outcomes

- Understand, analyse and examine the concepts of Communication Protocols with its architecture and functions.
- Illustrate and apply the appropriate internet architecture along with efficient protocol models for the user defined communication environment.
- Comprehend, categorize and formulate the appropriate IP routing protocol to establish a efficient data transfer.
- Comprehend, analyse and evaluate the concepts of Virtual wired service and IP/optical networking with its functions and deployment.
- Elucidate, analyse and inspect the IP traffic engineering and its models along with the security mechanisms.

RDBMS with VB .NET Practical

Objectives

- To understand data definitions and data manipulation commands ·
- To learn the use of nested and join queries ·

- To understand functions, procedures and procedural extensions of databases ·
- To be familiar with the use of a front end tool ·
- To understand design and implementation of typical database applications

Outcomes

- Use typical data definitions and manipulation commands.
- Design applications to test Nested and Join Queries
- Implement simple applications that use Views
- Implement applications that require a Front-end Tool
- Critically analyze the use of Tables, Views, Functions and Procedures

Social Networking

Objectives

- To learn about Social media, Social networking and Webcasts
- To understanding and building a Word Press Powered Website
- To analysis the Social Networking & Micro-Blogging.
- To learn and analysis the Widgets & Badges.
- To explore the importance of Website optimization.

Outcomes

- To understand, impart and summarize the concepts of Social media, Social networking and Webcasts
- To comprehend, design and develop a Word Press Powered Website
- To understand, implement and perform evaluation of Social Networking and Micro-Blogging
- To collaborate, implement and analyse the Widgets and Badges in social networking environment
- To understand, illustrate and perform evaluation of web optimization for social networks

Cyber Security

Objectives

- To understand the basics of Cybercrime and Computer forensics with protecting mechanism
- To explore the working principles of WLAN, Email and Smartphone along with security mechanism and guidelines
- To gain the ability to understand the importance of cyber investigations with its functioning role and learn the basics of Wi Fi and its security measures
- To understand and learn the method of seize the digital evidence
- To learn and analyze the concepts of digital forensics with cybercrime prevention techniques

Outcomes

- Understand, describe, analyze and examine the basics of Cyber security concepts and its implementation in India.
- Comprehend and demonstrate the security tips in browsers, WLAN, social networks, Email security and Smart phone. Apply the investigations in post mortem and Forensics
- Understand, apply and evaluate the various investigation roles and Wi Fi protecting mechanisms
- Understand, illustrate and evaluate the method of seize the digital information and evidences forensics data and evaluate the forensics reports
- Comprehend, apply and appraise the methods digital forensics with cybercrime prevention techniques.

Block Chain Technologies

Objectives

- To understand about Blockchain is an emerging technology platform for developing decentralized applications and data storage.
- To comprehend fundamentals of Public Key Cryptography technology and Consensus Algorithms.
- To familiarize with Bitcoin Network, Bitcoin Clients, APIs and Payments technology of blockchain operations.
- To engage with Components of the Ethereum ecosystem.
- To grasp about Development Tools and Frameworks.

Outcomes

- Understand, apply and examine the characteristics of blockchain, bitcoin and consensus algorithm in centralized and decentralized methods.
- Comprehend and demonstrate the application of hashing and public key cryptography in protecting the blockchain
- Understand and analyse the elements of trust in a Blockchain: validation, verification, and consensus.
- Comprehend and evaluate the alternate coin, Ethereum and smart contract
- Grasp and apply the knowledge of Tools and languages for applications

Social Networking Practical

Objectives

- To familiarize the tools required to manage social network applications
- To analyze social networks like Facebook, LinkedIn, Google+, GitHub
- To teach the fundamental techniques and principles in achieving social networking environment.
- To enable students to have skills that will help them to solve real time applications.
- To get explore in the Github API.

Outcomes

- To understand , implement and review the fundamental techniques and principles for social networks.
- To design and develop the programs using the tools required to develop and manage social network like Facebook, LinkedIn, Google+, GitHub.
- To create and explore the functionality of social networking tools such as GitHub.
- To understand , implement and review the fundamental principles for social network graph.
- To comprehend and critically analyse the existing API for social networks.

Cyber Security Practical

Objectives

- To learn and implement to Change the wireless device mode as monitor mode ·
- To develop in multiple vulnerabilities webserver ·
- To understand and implement the open ports in the network ·
- To acquire programming skills in Implement various wireless device modes ·
- To comprehend related to find the sub domains of webpage

Outcomes

- Comprehend the programming skills in Change the wireless device mode as monitor mode
- Understand and implement multiple vulnerabilities webserver
- Evaluate the use of different wireless device modes
- Design to Solve related to find the subdomains of webpage
- Create and apply open ports in the network

Block Chain Technologies Practical

Objectives

- To learn the basics of Blockchain and apply cryptographic algorithms ·
- To design, build, and deploy smart contracts and distributed applications,
- To deploy Private Blockchain and smart contracts on Ethereum.
- To understand and deploy cryptocurrencies and their functions in applications ·
- To implement Blockchain for various use cases.

Outcomes

- Enable to setup your own private Blockchain and deploy smart contracts on Ethereum
- Gains familiarity and implement with cryptography and Consensus algorithms
- Create and deploy projects using Web3j
- Recall and deploy the structure and mechanism of Bitcoin, Ethereum, Hyperledger
- Implement Blockchain for various use cases

II Year & III Semester

Web Technology and Advanced Java Programming

Objectives

- To gain knowledge of Object Oriented Programming Concept in Java ·
- To understand usages of String functions in Java.
- To familiarize with the applet and swing ·
- To grasp the concepts on Java Beans ·
- To comprehend the connection between Relational Database and Java

Outcomes

- Understand the Object Oriented Program including classes and methods, Web technologies
- Understand JavaScript, Client Side benefits using Java script
- Understand Advanced XML, , Extensible Style Sheet Transformation (XSLT) and Java Beans
- JDBC Architecture, JDBC Drivers, Communicating with Database using JDBC APIs
- Understanding JSP, Describing the JSP Life Cycle

Artificial Intelligence

Objectives

- To impart knowledge about Artificial Intelligence.
- To give understanding of the main abstractions and reasoning for intelligent systems.
- To enable the students to understand the basic principles of Artificial Intelligence in various applications.
- To identify the scope of Artificial Intelligence in real life applications ·
- To enable decoding of human thinking process and find the ways of making the machine decide intelligently in lieu of number crunching.

Outcomes

- Outline the applicability, strength and weakness of artificial intelligence in
- solving computational problems
- Demonstrate the role of knowledge representation, problem solving and learning in Intelligent-system engineering
- Identify the characteristics of AI, Knowledge representation, Experts systems and its variants with ANN and robotics.
- Assess the scientific background through various real time examples

Advanced Machine Learning

Objectives

- To understand the concepts of Machine Learning.
- To understand the theoretical and practical aspects of types of machine learning
- To teach and get familiarized with supervised learning and their applications.
- To teach and get familiarized with the concepts and algorithms of unsupervised learning.
- To appreciate the concepts and algorithms of deep learning.

Outcomes

- To understand, impart and analyze the concepts and of Machine Learning Techniques and types of data.
- To comprehend, apply and evaluate the classification techniques for realworld applications.
- To understand, use and perform evaluation of Regression methods.
- To recognize, implement and analyse the unsupervised techniques for realworld applications.
- To understand, identify, implement and review the deep learning techniques for real-time applications.

Web Technology and Advanced Java Programming Practical

Objectives

- To implement object oriented concepts in JAVA
- Develop the program using concepts Network programme
- Learn how to create a program in java beans.
- Learn how to connect relational database to Java
- Develop the program using concepts Applet

Outcomes

- Implement classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem.
- Apply Applets and Swing programs.
- Develop Servlets and JSP for creating Web based applications using JDBC

Software Development Technologies

Objectives

- To learn and Implementing Micro services
- To analysing the Azure Kubernetes Service
- To learn and anlyse .NET DevOps for Azure and its applications
- To building code for .NET core applications
- To get familiarized with Azure pipelines

Outcomes

- To understand, apply and summarize the basic concepts of Micro services communication Microsoft Azure and Dev Ops for software development life cycle.
- To illustrate, and implement Azure Kubernetes Service tools for software development life cycle.
- To recognize, analyse and summarize the functionalities of .NET Dev Ops for Azure applications.
- To understand, design and evaluate the principles and architecture service tools for software development life cycle
- To comprehend, implement and review the functionalities of API and API gateways for cloud and Azure applications.

Cryptography and Network Security

Objectives

- To familiarize classical encryption techniques and advanced encryption standards
- To explore the working principles and utilities of various cryptographic algorithms including secret key cryptography, hashes and message digests, and public key algorithms
- To recognize different encryption and decryption techniques to solve problems related to confidentiality and authentication
- To develop the ability to use existing cryptographic utilities to build programs for secure communication.
- To learn the need of digital signatures to secure the document with key management

Outcomes

- Comprehend and analyze the security concepts to apply and evaluate the encryption techniques in various models
- Understand and examine the various data encryption standards and number theory. Illustrate and evaluate the various techniques in different applications
- Grasp the knowledge of AES techniques and apply to evaluate the performance with different key types.
- Comprehend and analyse the basics of hash function and MAC that helps to develop the encryption models in various application.
- Understand and illustrate the need of digital signature to examine the method of providing good security to the document. And also learn the concept of key management

Cloud Computing

Objectives

- To introduce the cloud computing concepts and map reduce programming model.
- To provide skills and knowledge about operations and management in cloud technologies so as to implement large scale systems.

- To provide skills to design suitable cloud infrastructure that meets the business services and customer needs.
- To provide Knowledge of different CPU, memory and I/O virtualization techniques that serve in offering software, computation and storage services on the cloud; Software Defined Networks (SDN) and Software Defined Storage (SDS); cloud storage technologies and relevant distributed file systems, NoSQL databases and object storage;
- To introduce the variety of programming models and develop working experience in several of them.

Outcomes

- Understand the evolution, principles, and benefits of Cloud Computing in order to assess existing cloud infrastructures to choose an appropriate architecture that meets business needs.
- Decide a suitable model to capture the business needs by interpreting different service delivery and deployment models.
- Understand virtualization foundations to cater the needs of elasticity, portability and resilience by cloud service providers.
- Infer architectural style, work flow of real-world applications and to implement the cloud applications using map reduce programming models.
- Compare operation and economic models of various trending cloud platforms prevailing in IT industry.

Advanced Machine Learning Practical - VI

Objectives

- To formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To apply machine learning algorithms to solve problems of moderate complexity.
- To apply CNN to solve problems of moderate complexity.
- To apply LSTM and RNN to solve problems

Outcomes

- To understand and implement the mathematical and statistical prospective of machine learning algorithms through python programming.
- To recognize and develop the machine learning models through python in built functions
- To understand, impart and develop the machine learning models for real-time dataset
- To comprehend , impart and implement the deep learning models for real-time applications
- To identify and evaluate the performance machine learning models for realtime dataset

II Year & IV Semester

Computer Vision

Objectives

- To understand the fundamental concepts related to Image formation and processing.
- To learn feature detection, matching and detection ·
- To become familiar with feature based alignment and motion estimation ·
- To develop skills on 3D reconstruction ·
- To understand image based rendering and recognition

Outcomes

- To understand basic knowledge, theories and methods in image processing and computer vision.
- To implement basic and some advanced image processing techniques in OpenCV
- To apply 2D a feature-based based image alignment, segmentation and motion estimations
- To apply 3D image reconstruction techniques
- To design and develop innovative image processing and computer vision applications

Internet of Things

Objectives

- To get familiar with the evolution of IOT with its design principles
- To outline the functionalities and protocols of internet communication
- To analyze the hardware and software components needed to construct IOT applications
- To identify the appropriate protocol for API construction and writing embedded code
- To realize various business models and ethics in Internet of Things

Outcomes

- Comprehend the IoT evolution with its architecture and sensors.
- Understand the networking concepts for communication and underlying IoT protocols.
- Assess the embedded technologies and develop prototypes for the IoT products
- Evaluate the use of Application Programming Interface and design an API for IoT in realitime
- Recognize the ethics of business models and perform security analysis

High Performance Computing

Objectives

- To get a clear idea of High Performance Computing concept.
- To get brief knowledge about how to function the HPC systems.
- To get idea of what techniques used in HPC models.
- To understand a Parallel computing concepts.
- To get familiar with OpenMP technology that is widely used in HPC technology.

Outcomes

- Understand of the HPC and ccNUMA concepts
- Design and develop a parallel programming with modern C, C++ and new version of FORTRAN
- Apply with parallel computing
- Develop an efficient OpenMP programming
- Evaluate an efficient MPI programming

Parallel and Distributed Computing

Objectives

- To analyze the current popular distributed systems such as peer-to-peer (P2P) systems will also be analyzed.
- To learn and apply knowledge of parallel and distributed computing techniques and methodologies.
- To learn the architecture and parallel programming in graphics processing units (GPUs).
- To understand the memory hierarchy and cost-performance tradeoffs.
- To gain experience in the design, development, and performance analysis of parallel and distributed applications

Outcomes

- Develop and apply knowledge of parallel and distributed computing techniques and methodologies.
- Apply design, development, and performance analysis of parallel and distributed applications.
- Use the application of fundamental Computer Science methods and algorithms in the development of parallel applications.
- Explain the design, testing, and performance analysis of a software system, and to be able to communicate that design to others.
- Understand the requirements for programming parallel systems and how they can be used to facilitate the programming of concurrent systems.

Skill Enhancement Professional Competency Skill

Objectives

- Ensure that you understand what the job involves, and that you have the necessary skills
- Make sure you do want to work for the company
- Check that the philosophy / values of the company match your personal requirements
- Find out more about the job, training, career structure etc.