

**Department of Computer Technology**  
**Course Outcomes**  
**Session 2021-2022**

Sr. No.	Sem	Course Code	Subject	Course Outcomes
1	3	CT-2204 CT-2205	Data Structures Data Structures Lab	Acquire the basic concepts of language constructs and use them for problem solving
				Demonstrate the use of loops and arrays for handling similar type of data and perform various data manipulations on it using basic arithmetic operations to design good working solution for given problem
				Use technique of dynamic memory allocation for structures to solve problems of unknown input size
				Select appropriate linear data structures and use files to design good working solution for given problem
2	3	CT2202 CT2203	Object Oriented Programming Object Oriented Programming Lab	Understand the concept of object-oriented programming and modelling
				Apply the knowledge of object-oriented programming to solve the given problem
				Analyze the problem to provide the object-oriented solution using advanced programming concepts
				Design the event driven web based solution for the problem
3	3	GE1201	Engineering Mathematics-III	Estimate the Calculus of Numerical Function.
				Determine the transforms and inverse transforms of various functions of variables and use it to solve Mathematical equations.
				Discuss the nature of periodic function and express it in terms of series.
				Use appropriate method/s to solve partial differential equations.
4	3	CT-2201	Computer Architecture & Organization	Apply the fundamental knowledge to understand the functionality of computer system for CPU, Control Unit, Memory, IO and Storage.
				Analyze the execution of complete instruction, arithmetic and processor design.
				Design of adders, ALU and Memory management unit, Organization of memory, memory hierarchy, other peripheral devices, and estimate the cost of computation.
				Select any framework for python programming as per their understanding
5	3	CT2206	Python Programming	Write any python program using various data structures and control statements
				Write program where file handling and concepts of classes and objects are needed
				Develop advanced applications using functionalities provided under various packages of python
				Illustrate various internet technologies.
6	3	CT2207	Web Technology Laboratory	Design the web pages using some basic techniques.
				Implement the XML technology to store the data.
				Develop the interactive web pages using the advanced technique.
				Implement statistical formulae and visualization techniques
1	4	CT-2255 CT-2256	Mathematical Foundations for Data Analysis and Lab	Solve the real-life problem using the probability theory
				Analyze the problem to predict the solution using the estimation theory for given samples
				Write conclusion using hypothesis testing
				Compare different levels of abstraction & data independence.
2	4	CT-2257 CT-2258	Database Management Systems and Lab	Design Entity Relationship Diagram for any scenario.
				Solve queries based on relational algebra & SQL.
				Identify functional dependencies & normalize the database
				Analyze transaction management, various concurrency control protocols and crash recovery methods
3	4	CT2251 CT2252	Operating Systems and Lab	Describe the different services provided by operating systems at different level.
				Apply knowledge of different operating systems algorithms to solve a given problem
				Analyze various approaches used to improve system performance
				Differentiate various disk scheduling algorithms based on their performances.

4	4	CT-2253/CT-2254	Advanced Data Structures and Lab	Acquire the basic concepts of data structures and select appropriate data structures for solving real life problems
				Demonstrate various operations on linked list, skip list based on the requirements of real life problems
				Implement various hashing techniques
				Implement different types of trees and graph data structures and use them to solve problems dealing with non-linear data
5	4	GE2206	Discrete Mathematics & Probability Theory	Explain the basic concept of classical sets, fuzzy sets, Relations, functions and logical methods.
				Identify the nature of different algebraic structures such as Group, Ring, field
				Analyze the graphs and spanning of trees
				Determine the probability, Expectations of functions of two random variables
1	5	GE-2312	Fundamental of Economics	Recognizes consumer's behavior and pricing
				Extrapolates an operations in market with productions constrain.
				Describes the national income accounting and public finance.
				Interprets international trade and institutions.
2	5	CT2301/CT2302	Computer Networks and Computer Networks Lab	Understand design issues of layers and network reference model
				Solve the given problems related to networking domain.
				Analyze different networking protocol at various layers
				Evaluate the performance of network using different tools
3	5	CT 2317/CT 2318	Introduction to Geographical Information System / Lab	understand the various fundamental concepts of GIS , coordinate systems, projection, spatial analysis, recent trends in GIS
				compute geometric measurements and compare spatial models, map projection, coordinate systems, various geoprocessing tools
				analyze real life problems and prepare different geospatial layers, geodatabase, maps, model , share maps using GIS tools
4	5	CT2331	OE II: Soft Computing	Review applications of soft computing to solve problems in varieties of application domains
				Demonstrate Fuzzy logic and its applications
				Explain Rough Set theory and its usage as soft computing
				Relate single-objective optimization problems using GAs.
				Describe Artificial neural networks and its applications
5	5	CT2303	Theoretical Foundation of Computer Science	Construct automata, regular expression for any pattern.
				Construct context free grammar for various languages.
				Design push down automata and Turing Machine for a language.
				Derive whether a problem is decidable or not.
6	5	CT2327	OE I: Image Processing	Describe basic relationships between pixels
				Compare various image enhancement techniques in spatial domain and frequency domain
				Illustrate different image compression techniques to understand the advantage of image compression
				Demonstrate the applications of similarity based and dissimilarity-based approaches for image segmentation
				Interpret various representation techniques
7	5	CT2334	OE II:Multimedia and Animation	Understand multimedia basics - hardware and software
				Develop skills in design, illustration, image manipulation, graphic designing, video editing, visual effects and game designing
				Develop the skills in Animation software.
8	5	CT2328	Operating System Concepts	Use LINUX operating system
				Write Shell scripts
9	5	CT2332	OE II: Software Testing	Formulate problem by following Software testing life cycle.
				Design Manual Test cases for Software Project.
				Demonstrate utilization of testing automation through testing tool.
10	5	CT2313/CT2314	PE I:Mobile Operating Systems/ Mobile Operating Systems Lab	compare & analyze different flavors of mobile operating system and their specific features.
				design an app using different controls.
				design an app which can manage data and can communicate with native application.
				design and publish an app which can handle multiple devices with different configurations.

11	5	CT2315/ CT2316	PE I: Advanced Web Technologies/ Advanced Web Technologies Lab	Describe various concepts related to web site Apply the concepts used for web page designing Create web pages and web sites
12	5	CT2319 /CT2320	PE I :Computer Graphics / Lab	Draw lines and polygons and fill polygons using basic graphics functions Select proper imaging technology to be used for image creation Handle interactive software with images & text Develop animated programs for various applications
13	5	CT2335	OE II:CurrentTrendsand Technologies	Use the basics of internet for deployment of various servers and recourses Design and implement technologies for e-Commerce and e-Learning Choose appropriate implementation of Green Computing Make use of Social Networking properly and securely
14	5	CT2323/CT2324	PE I : Privacy and Security in Online Social Networks (PSOSN)/ Lab	Collect online social networking data using different tools and API's Review privacy and policies in social media Categorize eCrimes and Attacks in OSM Link profiles of user on OSM
15	5	CT2311	Randomized Algorithms/Lab	Apply basic concepts of probability calculus in algorithmic context Derive good upper bounds for the expected running time of simple randomized algorithms Design simple randomized algorithms that run fast or that return the correct output with high probability. Apply the probabilistic method to show the existence of certain combinatorial objects.
				Provide students an insight regarding internal working of companies in a team Understanding of project and product management Understand the importance of communication, and employment practices Analyze algorithms to find the time complexity in terms of asymptotic notations
1	6	CT2351/ CT2352	Design & Analysis of Algorithms/ Design & Analysis of Algorithms Lab	Solve recurrences using various techniques. Implement and analyze different algorithms like divide and conquer strategy, greedy strategy, dynamic programming algorithms and backtracking strategy Compare different types of complexity classes and categories algorithms into specific complexity class
2	6	CT2355 / CT2356	Software Engineering / Lab	Choose appropriate software engineering process model, requirement engineering principles and software designing fundamentals for a given project Select appropriate testing strategy and apply testing principles for testing a given application Apply basics of software configuration management, version control and change control in software development Able to estimate cost, effort and severity of software risk for given application Perform basic operations on Sub-version for software version control.
3	6	CT2353/CT 2354	Language Processors / Lab	Design lexical analyzer using FLEX tool Implement syntax analyzer using YACC tool Create a syntax-directed definition and an annotated parse tree Demonstrate the use of a symbol table throughout compilation Apply various code optimizing transformations and code generation techniques
4	6	CT2365/CT2366	PE-II-Business Intelligence and its Applications / Lab	Acquire the knowledge of basic concepts of Business Intelligence and multidimensional modelling and digital data types Apply the multidimensional data modelling and processing concepts Analyze the business information to construct the reports from it Use different modes / channels to implement the business intelligence solution for the specific problem
5	6	CT2372	OE-III-Essentials of IT	Develop algorithm and write pseudo code for a given problem statement Construct Entity-Relationship Model and design RDBMS for a given problem statement Design static and dynamic web pages using HTML and Javascript and write simple programs in Javascript Apply software engineering concepts in any software project implementation
6	6	CT2385	OE-IV-Current Trends & Technology	Use the basics of internet for deployment of various servers and recourses Design and implement technologies for e-Commerce and e-Learning Choose appropriate implementation of Green Computing Make use of Social Networking properly and securely

7	6	CT2363/CT2364	PE II: Internet of Things/Lab	Develop various IOT environments
				Demonstrate IOT architecture and its enabling technologies
				Analyze IOT environments using various communication technologies
				Apply various IOT enabling technologies for creation of IOT environments
8	6	CT2323	OE I: Image Processing	Describe basic relationships between pixels
				Compare various image enhancement techniques in spatial domain and frequency domain
				Illustrate different image compression techniques to understand the advantage of image compression
				Demonstrate the applications of similarity based and dissimilarity-based approaches for image segmentation
9	6	CT2381	OE IV: Soft Computing	Interpret various representation techniques
				Review applications of soft computing to solve problems in varieties of application domains
				Demonstrate Fuzzy logic and its applications.
				Explain Rough Set theory and its usage as soft computing.
10	6	CT2382	OE IV: Software Testing	Relate single-objective optimization problems using GAs.
				Formulate problem by following software testing life cycle.
				Design Manual Test cases for Software testing approaches.
				Demonstrate utilization of testing automation through testing tool.
11	6	GE: 2311	FUNDAMENTAL OF MANAGEMENT	Explain the Legal provision and Functions of Management.
				Analyze the role of Human Resource and Financial Management in the organization.
				Analyze the project life cycles.
				Identify tools and techniques for the marketing of goods and services
12	6	CT2369/CT2370	PEII: Customer Relationship Management(CRM) / Lab	Define the customer-centered organization and Implement the integral processes within an organization that are automated and how does the automation create predictability and efficiencies.
				Design and customize a CRM application for organization to suit their business needs.
				Look at business intelligence, cross selling/up selling, customer loyalty, continuous improvement and quality programs that have been the direct and ongoing result of implementing CRM applications.
				Employ the knowledge of customer-centered organization and implement the integral processes within an organization that are automated and how does the automation create predictability and efficiencies
13	6	CT2375	OE-III: Introduction to Salesforce	Represent a customize a CRM application for organization to suit their business needs
				Determine CRM strategies by understanding customers' preferences for the long-term sustainability of the Organizations
				Describe linguistic phenomena with formal grammars
				Illustrate and test algorithms for NLP problems
14	6	CT-2367/CT-2368	PE II: Introduction to Natural Language Processing / Lab	Examine NLP applications
				Devise real world NLP applications using NLP techniques
				Describe Basic relationships between pixels
				Compare various image enhancement techniques in spatial domain and frequency domain
15	6	CT2361	PE II: Digital Image Processing	Illustrate different image compression techniques to understand the advantage of image compression
				Demonstrate the applications of similarity based and dissimilarity-based approaches for image segmentation
				Interpret various representation techniques
				Understand the fundamentals of artificial intelligence and identify performance measure for given intelligent agent
1	7	CT2401/2402	Artificial Intelligence /Lab	Apply searching techniques for problem solving and planning
				Apply the concept of knowledge representation and transform real life information in different representations
				Solve AI problems using the techniques of uncertainty
				Identify threats to network security, associated attacks and countermeasures against attack.
2	7	CT 2403	Network Security	Use appropriate mathematical techniques in cryptography.
				Apply various algorithms/ mechanisms to formulate appropriate solution.
				Use of different security protocols at various networking layers.
				Understand the fundamentals of Artificial Neural Network and Fuzzy Logic
3	7	CT2411	PE-III-Neural Network and Fuzzy Logic	Apply the concepts of Artificial Neural Network and Fuzzy Logic for the given scenario
				Design single layer and multilayer neural networks for the given problem definition

4	7	CT 2412	PE - III - Ad-hoc Wireless Network	Compare the differences between cellular and ad hoc networks and identify the design issues at various layers.
				Summarize the protocols used at different layers of Adhoc network. Also compare the different protocols in each category
				Identify the various types of attack in ad hoc network.
				Classify QoS approaches and Identify the need of energy management in ad hoc network.
5	7	CT 2413	PE - III - Information Retrival System	Describe different Information retrievalmodels.
				Apply retrieval methodsfor given problems
				Evaluation of designed retrieval system
6	7	CT 2414	PE-III - Human Computer Interaction	Understand the fundaments of human components for interaction with computer
				Understand the designing techniques used for interaction with computer
				Understand the evaluation techniques used for interaction with computer
7	7	CT 2421 / CT2422	PE IV: Pattern Recognition /Lab	Demonstrate the concepts of pattern recognition, probability, random variable, density function, different feature extraction techniques and solve problems for the given data
				Compute the parameters for different density functions and interpret it
				Design appropriate pattern recognition solutions to classification, regression, and clustering problems.
				Evaluate and interpret the results of the applied techniques to solve pattern recognition problem
8	7	CT-2423 / CT2424	PE IV: Cyber Forensics / Lab	Understand the fundamentals of Computer & Digital Forensics
				Describe the usage of tools to collect data useful for investigation
				Use forensic tools to collect evidence and generate report of investigation

9	7	CT2425/2426	PE - IV -Machine Learning /Lab	understand the knowledge of various machine learning techniques and design methods
				apply various machine learning techniques/tools to solve real life problems
				analyze various tools and techniques of machine learning
				evaluate the performance of a machine learning techniques
				design a solution using machine learning technique for given real life problems
10	7	CT 2427/2428	PE-IV: Design Patterns/ Lab	understand the fundamentals of design pattern
				apply object oriented techniques and tools to implement various design patterns
				analyze the complexity of design patterns
				design solution for various types of patterns
11	7	CT 2429/2430	PE-IV: Mobile Communications / Lab	Compare and analyze different processor architectures.
				Apply different data types and instruction sets for implementation of different system programs.
				Implementation of Assembler
				Implementation of Macro processor and apply installation of device driver.
				Implementation of Direct Linking Loader
12	7	CT 2431/2432	PE-IV: Software Project Management / Lab	Differentiate between various Object file formats.
				Understand basic concepts about project,projectmanagementandprojectplanning.
				Assess givenrequirements and performcostbenefitanalysis and current completion stateofproject.
				Create a project schedule using some network planning model and a risk management plan for given requirements..
				Evaluate the project and risk involved
13	7	CT2433 / CT2434	PE-IV: Numerical Computing / Lab	Apply appropriate formula to find different types of error in numerical computation and mitigate it.
				Choose appropriate numerical techniques for problem solving interpret the results and assess accuracy
				Apply appropriate techniques for numerical integration.
				Demonstrate basics of conditioning of problems and stability of numerical algorithms
				Understand the basics of cloud computing, cloud models and its applications
14	7	CT2435	PE - V-Cloud Computing	Apply the requirements of various service paradigms in Cloud Computing
				Analyze suitable type of virtualization
				An ability to classify the techniques, tools, skills in a secured cloud environment
				Design a cloud-based system, process, component, or program to meet desired needs.
				Identify areas where parallel computing is applicable
15	7	CT2436	PE - V-Parallel programming	Implement parallel version of different algorithms using thread programming and OpenMP
				Find the speedup factor by analyzing parallel programs
				Develop real life applications using parallel programming
				Understand the various supervised and unsupervised data processing and mining techniques for knowledge extraction
16	7	CT2437	PE - V-Data Mining	Apply various data mining techniques to extract knowledge from the given problem
				Analyse the various data mining techniques
				Evaluate the various supervised and unsupervised data processing and mining techniques for knowledge extraction
				Understand the concept of Embedded System and different Applications of a microcontroller.
17	7	CT2438	PE - V-Embedded System	Distinguish real- time embedded systems from other systems
				Understand the design process of Embedded System, Inter-process Communication and Synchronization of processes, Threads and Tasks.
				Understand the architectural support of ARM processor, function of memory management, instruction set of ARM controller.
				Identify and develop operational research models from the verbal description of the real system.
18	7	CT2439	PE - V-Operations Research	Understand the mathematical tools that are needed to solve optimisation problems.
				Use mathematical software to solve the proposed models.
				Develop a report that describes the model and the solving technique, analyse the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.

19	7	CT2440	PE - V-Bioinformatics	Acquire the basic concepts of Bioinformatics and its significance in Biological data analysis.
				Describe the history, scope and importance of Bioinformatics and role of internet in Bioinformatics.
				Explain about the methods to characterise and manage the different types of Biological data.
				Classify different types of Biological Databases.
20	7	CT 2409	Mini Project	Identify real life technical problem, conduct literature survey, and find limitations in existing solutions to address societal and industrial concerns.
				Analyze the problem and identify suitable tools and technologies for finding solution to the problem.
				Communicate proposed solution effectively with proper presentation methods.
21	7	CT 2410	CRT	Infer the Knowledge about current trends in industry
				Deliver Technical presentation
				Communicate effectively
1	8	CT 2451	Major Project	Acquire the domain knowledge and analyze the implemented model
				Design and develop the solution using appropriate tools and techniques for betterment of society and industry
				Communicate the work done through paper presentation or participation in competition as a team.
2	8	CT2452	Extra Curricular Activities Evaluation	Develop his hobbies and interests
				Communicate and work in team
				Develop the sense of responsibility