V Semester B. Tech. (Information Technology)

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
				L	T	P		Continual Assessment	End Sem Examination	Total
1	PCC	23IT501T	Data Base Management System	3	-	-	3	30	70	100
2	PCC	23IT501P	Data Base Management System Lab	-	-	2	1	25	25	50
3	PCC	23IT502T	Design and Analysis of Algorithms	3	1	-	4	30	70	100
4	PCC	23IT502P	Design and Analysis of Algorithms Lab	-	-	2	1	25	25	50
5	PCC	23IT503T	Theory of Computation	3	1	-	4	30	70	100
6	PCC	23IT504T	Professional Elective - I	3	-	-	3	30	70	100
7	OE	23IT561O	Open Elective – II	3	-	-	3	30	70	100
8	VSC	23IT505T	Technical Skill Development - II	2	-	-	2	50	-	50
9	SEC	23IT541P	Career Development - V	-	-	2	1	50	-	50
Total				**17**	**2**	**6**	**22**	**300**	**400**	**700**
10	MDM	23IT551M	MDM-III Cloud Applications and Development	3	-	-	3	30	70	100
Total				**20**	**2**	**6**	**25**	**330**	**470**	**800**

Professional Elective - I	
23IT504T(i)	PE-I Gaming Architecture and Programming
23IT504T(ii)	PE-I Human Computer Interface
23IT504T(iii)	PE-I IoT DevOps

Open Elective - II	
23IT561O(i)	OE-II Web Technologies
23IT561O(ii)	OE-II Computer Animation

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23IT501T	Database Management System	3	-		3	30	70	100

Course Objectives	Course Outcomes
This course is intended	**Students will be able to·**
● To train the fundamental concepts of database management system, database modeling and design, SQL system implementation techniques. ● To enable students to model ER diagram for any customized applications. ● To provide knowledge on distributed databases, concurrency techniques, federated systems and active databases.	● An ability to apply the knowledge of mathematics, science and computing appropriate to the discipline. ● Understand the concept of data storage. ● Solve issues of information systems using the learned database principles. ● Construct database application using current tools and techniques. ● To gain overview advance SQL for database application.

Unit I : Introduction	**[9Hrs]**
History and motivation for database systems; components of database systems; DBMS functions; Database Architecture, Data Abstraction, Data Independence, Formal relational query languages: Relational Algebra, Tuple Relational calculus, Domain Relational Calculus. Database query languages: Overview of database languages; Introduction to SQL.	
Unit II: Storage and file structure	**[9Hrs]**
Data dictionary storage, Basic concepts of indexing, Ordered indices, B+ Tree index files, B+ Tree indexing, B+ Tree Extensions, Multiple Key Access, Hashed files; signature files; Database efficiency and tuning, Bitmap Indices, Index Definition in SQL.	
Unit III: Data Models	**[9Hrs]**
Entity Relationship Model, Development of ER Diagrams, Extended Entity Relationship Model, Relational database design: Database design; Codd's Relational Database Rules, functional dependency; normal forms; multi-valued dependency; join dependency; SQL: Nested Sub-queries Join Expressions, Views, Integrity Constraints	
Unit IV: Transactions	**[9Hrs]**
Failure and recovery; concurrency control in SQL, Overview of Query Processing, Measures of Query cost, Evaluation of relational algebra expressions, Query equivalence, Query optimization.	
Unit V: Advanced SQL	**[9Hrs]**
Dynamic SQL and Embedded SQL, Functions and Procedures, Triggers. Overview of OODBMS & Distributed DBMS, Introduction to NoSQL Database	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Database System Concepts	Abraham Silberschatz, Henry F. Korth and S. Sudarshan	6th	McGraw Hill (SIE), 2013.
2	Database Systems - Models, Languages, Design and Application Programming	Ramez Elmasri and Shamkant Navathe	6th	Pearson Education
3	Database Systems Concepts	Shio Kumar Singh	2nd	Pearson Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1	An introduction to database systems	C. J. Date	8th	Addison Wesley

Web Resources

1	https://www.tutorialspoint.com/dbms/index.htm
2	https://www.studytonight.com/dbms/introduction-to-sql.php
3	https://www.geeksforgeeks.org/introduction-of-dbms-database-management-system-set-1/

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23IT501P	Database Management System Lab		-	2	1	25	25	50

Course Objectives	Course Outcomes
This course is intended • To train the fundamental concepts of database management system, database modeling and design, SQL system implementation techniques. • To enable students to model ER diagram for any customized applications. • To provide knowledge on distributed databases, concurrency techniques, federated systems and active databases.	**Students will be able to·** • Demonstrate and design a database using basic concepts like tables and relationships. • Construct SQL queries for data definition, manipulation, and retrieval tasks across multiple tables. • Design and implement a database schema for given problem.

Expt. No.	Title of the experiment
1	SQL Database Installation
2	SQL Query for Database Creation & Deletion
3	SQL Query for Relation Creation & Deletion
4	SQL Query for Constraints
5	SQL Query for DML commands
6	SQL Query for DCL Commands
7	SQL Query for TCL Commands
8	SQL Query for Join & Set Operations
9	Micro Project

Text Books

S.N	Title	Authors	Edition	Publisher
1	Database System Concepts	Abraham Silberschatz, Henry F. Korth and S. Sudarshan	6th	McGraw Hill (SIE), 2013.
2	Database Systems - Models, Languages, Design and Application Programming	Ramez Elmasri and Shamkant Navathe	6th	Pearson Education
3	Database Systems Concepts	Shio Kumar Singh	2nd	Pearson Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1	An introduction to database systems	C. J. Date	8th	Addison Wesley
2	Database system implementation	H. Garcia et al.	-	Prentice Hall,2000

ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY,NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech. Scheme of Examination & Syllabus 2023-24

INFORMATION TECHNOLOGY

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23IT502T	Design and Analysis of Algorithms	3	1		4	30	70	100

Course Objectives	Course Outcomes
This course is intended • Analyze the asymptotic performance of algorithm • Apply important algorithmic design paradigms and methods of analysis • Solve simple to moderately difficult algorithmic problems arising in applications • Able to demonstrate the hardness of simple NP-complete problems	**Students will be able to·** • Illustrate different approaches for analysis and design of efficient algorithms and Analyze performance of various algorithms using asymptotic notations. • Determine and apply various divide & conquer strategies and greedy approaches for solving a given computational problem • Demonstrate and solve various real time problems using the concepts of dynamic programming • Make use of backtracking and graph traversal techniques for solving real-world problems • Recall and Classify the NP-hard and NP-complete problems

Unit I: Introduction to Algorithm **[9Hrs]**

Definition of algorithms and brief explanation about the basic properties of algorithms Recurrence relations, solutions of recurrence relations using technique of characteristic equation, master theorem, Asymptotic notations of analysis of algorithms, worst case, average case and best case, amortized analysis, application of amortized analysis.

Unit II: Greedy and Divide & Conquer Approach **[9Hrs]**

Divide and conquer strategies: Binary search, Stressen's matrix multiplication algorithm, min-max algorithm.
Greedy Approach: Application to job sequencing with deadlines problem, knapsack problem, optimal merge pattern, Huffman code, minimum cost spanning tree using Prim's and Kruskal's algorithm.

Unit III: Dynamic Programming **[9Hrs]**

Dynamic Programming: Basic Strategy, Multistage graph (forward and backward approach), Longest Common Subsequence, Optimal Binary Search Tree, 0/1 Knapsack problems, Travelling Salesman problem, single source shortest path using Bellman-Ford algorithm, all pair shortest path using Floyd- Warshall algorithm

Unit IV: Backtracking Algorithm **[9Hrs]**

Basic Traversal and Search Techniques: Breadth first search and depth first search, connected components.
Backtracking: Basic strategy, N-Queen Problem and their Analysis (4 & 8-Queen), graph coloring, Hamiltonian cycles.

Unit V: Computational Complexity **[9Hrs]**

NP-hard and NP-complete problems, basic concepts, non-deterministic algorithms, NP-hard and NP-complete, Cook's theorem, decision and optimization problems, graph based problems on NP Principle.

Text Books

S.N	Title	Authors	Edition	Publisher
1	I Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein	3rd	Prentice Hall of India
2	The Design and Analysis of Computer Algorithms",	Alfred V. Aho, John E. Hopcraft, Jeffrey D. Ullman		Pearson education
3	Fundamentals of Computer Algorithms	Horowitz, Sahani, Rajsekharam	2nd	University Press

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Fundamentals of Algorithms"	Brassard, Bratley		Prentice Hall
2	Design and Analysis of Algorithms	Parag Dave, Himanshu Dave	2nd	Pearson Education
3	Computer Algorithms: Introduction to Design and analysis, 3rd Edition,	Sara Baase and A.V. Gelder	3rd	Pearson Education

Web Resources

1	https://www.geeksforgeeks.org/analysis-of-algorithms/
2	https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm
3	https://onlinecourses.nptel.ac.in/noc19_cs47/preview
4	https://www.classcentral.com/course/swayam-design-and-analysis-of-algorithms-3984?utm_source

		July 2024	NEP(1.0)	Applicable for 2025-26
Chairman - BoS	Dean – Academics	Date of Release	Version	

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23IT502P	Design and Analysis of Algorithms Lab		-	2	1	25	25	50

Course Objectives	Course Outcomes
This course is intended ● Analyze the asymptotic performance of algorithm ● Apply important algorithmic design paradigms and methods of analysis ● Solve simple to moderately difficult algorithmic problems arising in applications ● Able to demonstrate the hardness of simple NP-complete problems	**Students will be able to·** ● Apply different approaches for analysis and design of efficient algorithms using asymptotic notations. ● Apply various divide & conquer strategies and greedy approaches for solving a given computational problem ● Solve various real time problems using the concepts of dynamic programming ● Make use of backtracking and graph traversal techniques for solving real-world problems

Expt. No.	Title of the experiment
1	Practical based on Binary search algorithms.
2	Practical based on matrix multiplication algorithm
3	Practical based on min-max algorithm
4	Practical based on Huffman code
5	Practical based on Knapsack and Prim's problems
6	Practical based on Traveling Salesman problem
7	Practical based on Bellman- Ford algorithm
8	Practical based on Floyd- Warshall algorithm
9	Micro Project

Text Books

S.N	Title	Authors	Edition	Publisher
1	I Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein	3rd	Prentice Hall of India
2	The Design and Analysis of Computer Algorithms",	Alfred V. Aho, John E. Hopcraft, Jeffrey D. Ullman	-	Pearson education
3	Fundamentals of Computer Algorithms	Horowitz, Sahani, Rajsekharam	2nd	University Press

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Fundamentals of Algorithms",	Brassard, Bratley	-	Prentice Hall
2	Design and Analysis of Algorithms	Parag Dave, Himanshu Dave	2nd	Pearson Education
3	Computer Algorithms: Introduction to Design and analysis, 3rd Edition,	Sara Baase and A.V. Gelder	Third Edition	Pearson Education

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
23IT503T	Theory of Computation	3	1	-	4	CA	ESE	Total
						30	70	100

Course Objectives	Course Outcomes
This course is intended • To introduce Formal Languages, Automata Theory and Abstract models of Computation and Computability, Computational complexities and NP – Completeness. • To gain knowledge in computational theory. • To realize the theoretical concepts and techniques involved in the software system development	**Students will be able to** • Apply the theoretical concepts and techniques in designing the software systems. • Identify, analyze, design and formulate problems using computational theory. • Demonstrate experiments and interpret data using computational theory. • Formulate Push Down Automata and its equivalent CFG. • Summarize different decidable and undecidable problems.

Unit I: Automata	**[9Hrs]**
Automata: Strings, Alphabet, Language, Operations, Finite State Machine, definitions, finite automation model, acceptance of strings and languages, on deterministic finite automaton, deterministic finite automaton, equivalence between NFA and DFA, Conversion of NFA into DFA, Finite Automata with Epsilon Transitions	
Unit II: Regular expressions	**[9Hrs]**
Regular expressions :Regular sets, regular expressions, identity rules, manipulation of regular expressions, equivalence between RE and FA, inter conversion, Closure properties of regular sets(proofs not required),regular grammars, right linear and left linear grammars equivalence between regular linear grammar and FA.	
Unit III: Context free grammars	**[9Hrs]**
Context free grammars: Context free Grammars, Derivation trees, Left Most Derivations, Right Most Derivations, Ambiguity in Context-Free Grammars, Normal Forms, Chomsky Normal Form (CNF), Greibach Normal Form (GNF).Pumping Lemma for CFL	
Unit IV: Push Down Automata	**[9Hrs]**
Push Down Automata: Definition of Push Down Automata, Languages of Pushdown Automata, Turing machine :Turing machine, definition, model, design of TM, Computable Functions, recursive enumerable language, types of TM's.	
Unit V: Classes of problems	**[9Hrs]**
Classes of problems: Chomsky hierarchy of languages, linear bounded automata and context sensitive language, decidability of problems, Universal Turing Machine, undecidability of post's correspondence problem. Turing reducibility, definition of P and NP problems, NP complete and NP hard problems.	

Text Books

SN	Title	Authors	Edition	Publisher
1	Theory of Computation	Anuradha A. Puntambekar	1st	Technical Publication
2	Theory of Computation	Dr. O. G. Kakde	1st	Laxmi Publications
3	Introduction to the Theory of Computation	Michael Sipser	2nd	CENGAGE Learning.
4	Theory of Computation	Vivek Kulkarni		Oxford

Reference Books

SN	Title	Authors	Edition	Publisher
1	Introduction to Automata Theory, Languages, and Computation	Hopcroft, John E.;Motwani, Rajeev;Ullman, Jeffrey D.	3rd	Pearson. ISBN 1292039051
2	An Introduction to Formal Language & Automata	Peter Linz	3rd	Narosa Publishers

Online Resources

1	https://onlinecourses.nptel.ac.in/noc25_cs70/preview
2	https://www.geeksforgeeks.org/lmn-toc/
3	https://www.tutorialspoint.com/automata_theory/index.htm

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23IT504T (i)	PE- I Gaming Architecture and Programming	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
The course is intended ● Discuss and define the terms and principles of game design and development. ● Select and evaluate programming and scripting languages to develop particular games. ● Define the structure and duties of the game development team.	**Students will be able to** ● Understand the Core Design and specification of Game. ● Conduct and Investigate Game Research using different technologies. ● Study the development phases of Games and implement the Game Programming. ● Understand and apply Game Resources in Game project. ● Implementing Augmented Reality App.

Unit I **[9Hrs]**

Core Game Design: Game design principles, Game design process, What Is a Game? Games Mean Gameplay. Game Genres, Creating the Game Specification, Example Game Spec, Interactivity, Detailed design of Gameplay, Game Balance, Look and Feel, Game interface types, The future of Game Design.

Unit II **[9Hrs]**

Current Methods of Team Management, The Software Factory: Organizing a Software Factory, Milestones and Deadlines: Fuzzy Milestones, Milestones and Mini-Milestones, when to use Milestones, Procedures and Process: Procedures Where to use them? Troubleshooting: Risks, The Future of Industry: The state of the Industry.

Unit III **[9Hrs]**

Initial Design: The Beginning. Hardware Abstraction. The Problem Domain. Thinking in Tokens. Use of Technology: The State of the Art. Blue-Sky Research. Reinventing the Wheel. Use of Object Technology, Building Blocks: Reusability in Software, Initial **Architecture Design:** Architectural styles, The Tier System. Architecture Design. Development: The Development Process. Code Quality. Coding Priorities. Debugging and Module Completion. The Seven Golden Gambits. The Three Lead Balloons.

Unit IV **[9Hrs]**

GAME PROGRAMMING: Game Platforms, Game display Technologies: Tools for game development, Display systems, Game Engines, User Interface, Resource caching, the main loop .
Building your game: Project Directory Structure, Game Build Process, User interface components, More Control Properties,2D Drawing concepts, Sprites, Graphics File formats. Working with Unity Game engine.

Unit V **[9Hrs]**

Initialization and the Main Loop: Initializing Game objects, Game Loop, Cleanup. Loading and Caching Game Resources: Image and Audio Formats, Compression Resource Files ,Resource File builder, Resource Cache, 3D Graphics and 3D Engines: 3D Graphics Pipeline,3D Middleware, Introduction to Virtual and Augmented Reality.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Game Architecture and Programming	Shankarmani, Jain, Sinha	-	Wiley Publication,
2	Game Coding Complete	Mike Mc Shaffrfy and David Graham,	4th	Cengage Learning

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Fundamentals of Game Design	Ernest Adams,Andrew Rollings,	2nd	Pearson Publication
2	Game Architecture and Design	Andrew Rollings and Dave Morris	-	
3	ActionScript 3.0 Game Programming University,	Gary Rosenzweig,	-	Pearson Education.

Online Resources

1	https://www.udemy.com/course/unitycourse2/?couponCode=ST6MT60525G3
2	https://www.udemy.com/course/the-ultimate-guide-to-game-development-with-unity/

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23IT504T (ii)	PE-I Human Computer Interface	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
This course is intended ● To understand interface process and design various models ● To create various interaction styles ● To study various design issues.	**Students will be able to** ● Summarize user interaction process ● Design various Models and Theories ● Apply various Interaction Styles ● Summarize various design issues of Interface ● Create environment outside the box

Unit I : Introduction and Design Process	**[9Hrs]**
Interaction design basics, HCI in the software process, Design rules, Implementation support, Evaluation techniques, Universal design, User support.	
Unit II: Models and Theories	**[9Hrs]**
Cognitive models, Socio-organizational issues and stakeholder requirements, Communication and collaboration models, Task analysis, Dialogue notations and design, Models of the system, Modeling rich interaction.	
Unit III: Interaction Styles	**[9Hrs]**
Direct Manipulation and Virtual Environments, Menu Selection, Form Filling and Dialog Boxes, Command and Natural Languages, Interaction Devices, Collaboration and Social Media Participation.	
Unit IV: Design Issues	**[9Hrs]**
Quality of Service, Balancing Function and Fashion, User Documentation and Online Help, Information Search, Information Visualization.	
Unit V: Outside the Box	**[9Hrs]**
Group ware, Ubiquitous computing and augmented realities, Hypertext, multimedia, and the World Wide Web.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Human Computer Interaction	Alan Dix, Janet Finlay	-	Pearson Education
2	Designing the User Interface - Strategies for Effective Human Computer Interaction	Ben Shneiderman	-	Pearson Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Usability Engineering: Scenario-Based Development of Human Computer Interaction	M. B. Rosson, J. M. Carroll	-	Elsevier
2	The Essentials of Interaction Design	Alan Cooper	-	Wiley Publishing
3	The Resonant Interface: HCI Foundations for Interaction Design	Nielsen, J. Morgan Kaufmann, San Francisco	-	Addison-Wesley

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23IT504T (iii)	PE-I IoT DevOps	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
The course is intended ● DevOps methodology and its key concepts ● Linux for DevOps ● Cloud computing and DevOps ● Source code management with Git ● Continuous integration concept ● Configuration management in DevOps ● Popular DevOps tools like Docker, Puppet, Chef and SaltStack ● System monitoring using Splunk ● The concept of version control with Nagios	**Students will be able to** ● Explain DevOps methodology and its key concepts ● Manage source code using Git ● Deploy DevOps concepts to respond faster to client needs ● Understand Docker in DevOps ● Understand ZnagiOS for DevOps

Unit I	**[9Hrs]**
Introduction, IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, SmartApplications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT For Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management, eHealth	
Unit II	**[9Hrs]**
Introduction to Software Development LifeCycle, Agile Methodology and DevOps Process, Introduction to Operating System, Linux commands for DevOps	
Unit III	**[9Hrs]**
Cloud Computing, Cloud Services for DevOps, Managing Source Codes through various version control systems, Building & managing source code, Local repository & Remote Repository	
Unit IV	**[9Hrs]**
Building Source code, Understanding CICD pipeline, Integration tool JENKINS, Continuous Integration and its Tools, Managing Configuration in DevOps, Continuous deployment in DevOps.	
Unit V	**[9Hrs]**
Docker in DevOps , Puppet and Chef for DevOps ,SaltStack for DevOps, System Monitoring in DevOps using Splunk, Nagios for DevOps	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Learning DevOps: Continuously Deliver Better Software	Joakim Verona, Michael Duffy, Paul Swartout	-	Packt
2	Practical DevOps	Joakim Verona	-	Packt

Reference Books

S.N	Title	Authors	Edition	Publisher
1	The DevOps Adoption Playbook: A Guide to Adopting DevOps in a Multi-Speed IT ..	Sanjeev Sharma	-	Wiley
2	Learning DevOps: The complete guide to accelerate collaboration with Jenkins .	Mikael Krief	-	Packt

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23IT561O (i)	OE-II Web Technologies	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
This Course is intended ● Understand HTML web development markup ● Building Strong expertise to develop front end application using CSS3 ● Design and develop interactive, client-side, executable web applications ● Able to build the database and make user interface for web application	**Students will be able to** ● Create web pages using HTML ● Develop front end application using CSS ● Design and implement dynamic web pages using event-based Programming ● Construct **PHP** scripts to create dynamic web content. ● Connect the database using SQL

Unit I: HTML	**[9Hrs]**
Introduction, www, Internet, URL, Common tags: Text formatting tags Line and Paragraph tags Lists: ordered list Unordered List, definition List, anchor tag , Absolute and relative path, Tables and its attributes, Image tag- alt attribute, image mapping frames, forms	
Unit II: Cascading Style sheet	**[9Hrs]**
Introduction CSS, Applying CSS to HTM, Selectors, Properties and Values, CSS Colors and Backgrounds, CSS Box Model, CSS Margins, Padding, and Borders, CSS Text and Font Properties	
Unit III: Java Script	**[9Hrs]**
Introduction to JavaScript, Applying JavaScript (internal and external), Understanding JS Syntax, Introduction to Document and Window Object, Variables and Operators, Data Types and Num Type Conversion, Math and String Manipulation, Objects and Arrays, Date and Time, Conditional Statements, Switch Case, looping in JS, Functions	
Unit IV: PHP	**[9Hrs]**
Introduction to PHP. Evaluation of Php, Basic Syntax, Defining variable and constant, Php Data type, Operator and Expression, Decisions and loop, Function, Array, Handling Html Form with Php	
Unit V: Database Connectivity with MySql	**[9Hrs]**
Introduction to RDBMS, Connection with MySql Database, performing basic database operation (DML) (Insert, Delete, Update, Select), Setting query parameter.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	HTML: The Complete Reference	Thomas A. Powell	-	McGraw Hill.
2	Learning PHP, MySQL, JavaScript, CSS & HTML5: A Step-by-Step Guide to Creating Dynamic Websites	Robin Nixon	3rd	OREILLY

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Java Script: The Complete Reference 2/E	Thomas Powell	-	McGraw Hill.

Web Resources

1	W3school.com
2	https://www.w3schools.com/php/default.asp
3	https://www.w3schools.com/mysql/default.asp

		July 2024	NEP(1.0)	Applicable for 2025-26
Chairman - BoS	Dean – Academics	Date of Release	Version	

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23IT561O (ii)	OE-I Computer Animation	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
This Course is intended ● To use basic 3D modeling techniques ● To use basic shading, rendering, texturing and lighting techniques ● To apply animation concepts learned in fundamentals of animation to a 3D environment. ● To create a short 3D animation	**Students will be able to** ● Understand, identify and design art relating to that particular artwork in the given time frame ● Apply the concepts of animation using maya ● Understand and apply 3D animation concepts. ● summarize various formats and effects of motion capture. ● Relate and apply the features of animation and VFX for animated application.

Unit I **[9Hrs]**

What is mean by Animation – Why we need Animation – History of Animation – Uses of Animation – Types of Animation – Principles of Animation – Some Techniques of Animation – Animation on the WEB – 3D Animation – Special Effects - Creating Animation.

Unit II **[9Hrs]**

Introduction to the interface of Maya, Menu bar, Tool bar, Hot box, Using the shelf, hot keys. Using the spacebar, manipulating a view. Creating objects: Simple primitives, Lights, cameras. Selecting objects, types of selection, Single selection, adding and subtracting selection. Edit menu selection options, Marquee selection, Lasso selection, selection mask Using hyper shade, Relationship editor, hyper graph and outliner.

Unit III **[9Hrs]**

3D Animation & its Concepts – Types of 3D Animation – Skeleton & Kinetic 3D Animation – Texturing & Lighting of 3D Animation – 3D Camera Tracking – Applications & Software of 3D Animation

Unit IV **[9Hrs]**

Motion Caption – Formats – Methods – Usages – Expression – Motion Capture Software's – Script Animation Usage – Different Language of Script Animation Among the Software, Visual special effects techniques.

Unit V **[9Hrs]**

Animation &VFX around the world, concept development-story developing, Audio &Video-color Model-Device Independent Color model-Gamma and Gamma correction-Production Budgets-3D animated Movies

Text Books

S.N	Title	Authors	Edition	Publisher
1	PRINCIPLES OF MULTIMEDIA	Ranjan Parekh	-	TMH
2	Multimedia Technologies	Ashok Banerji, Ananda Mohan Ghosh	-	McGraw Hill Publication

Reference Books

S.N	Title	Authors	Edition	Publisher
1	The complete animation	Chris Patmore Pub.-Baron's	-	Educational Series.(New York)
2	Animation Unleashed	Ellen Bessen, Michael Weise	-	Productions,2008(U.S.A)

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23IT505T	Technical Skill Development-II	2	-	-	2	50		50

Course Objectives	Course Outcomes
This course is intended to ● Apply front-end development skills to build modular, component-based applications using React. ● Understand the core concepts of HTML, CSS, for developing responsive and interactive web pages. ● Integrate APIs and handle routing, state, and form processing in dynamic web applications.	**Students will be able to**· ● Design and implement responsive web interfaces using HTML and advanced CSS concepts.Perform testing in AngularJS ● Build single-page applications (SPAs) using React with component architecture, hooks, and routing. ● Integrate REST APIs in React apps and manage state effectively for dynamic data rendering.

Unit I : Advanced CSS	**[10Hrs]**
CSS Flexbox and Grid Layout, Responsive Design with Media Queries, CSS Variables and Custom Properties, Pseudo-classes and pseudo-elements, CSS Animations, Transitions, Key frames Positioning and z-index, Layout design using modern CSS.	
Unit II: Storage and file structure	**[10Hrs]**
React introduction, JSX, Virtual DOM, Functional components and Props, State management with useState, Event handling and conditional rendering, use Effect hook for side effects.	
Unit III: React Advanced Concepts	**[10Hrs]**
React Forms and controlled components, React Router for single-page navigation, API Integration using fetch or Axios, Modular design and component reuse	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Learning React	Alex Banks and Eve Porcello	First	O'REILLY
2	HTML;CSS: The Complete Reference	Thomas A. Powell,	5th	McGraw Hill

Reference Books

S.N	Title	Authors	Edition	Publisher
1	The Road to learn React	Robin Wieruch	1st edition	Independently Published
2	Learn AngularJS by one day,complete angular JS guide with example	Krishna Rungta	1st edition	Independently Published

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23IT506P	Career Development - V	-	-	2	1	Audit		

Course Objectives	Course Outcomes
The course is intended To suit the need of the outgoing students and to acquaint them with frequently asked patterns in quantitative aptitude and logical reasoning during various examinations and campus interviews	**Students will be able to** • Enhance personality to deal with the various problems of a professional world • Express and demonstrate the right soft skills • Solve basic and complex mathematical problems in short time. • Perform well in various competitive exams and placement drives • Compete in various competitive exams like CAT, CMAT, GATE, GRE, GATE, UPSC,GPSC etc.

Unit I	**[9Hrs]**
Chain Rule Problem, Speed Time Distance(Part1-Basic Problem, Relative Speed),Speed Time Distance(Part2-Problem on Trains, Races)	
Unit II	**[9Hrs]**
Permutation & Combination, Probability ,Logical Thinking & Data Sufficiency	
Unit III	**[9Hrs]**
Operator Based Questions, Number & Letter Series & Logical Sequence of Words, Grammar Subject Verb agreement, Prepositions.	
Unit IV	**[9Hrs]**
Conjunction, Tense, Identifying Common errors, Decision Making Skills & Negotiating Skills	
Unit V	**[9Hrs]**
Personal Interview Skills,MS PowerPoint	

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Personality Development and Soft Skills	Barun K. Mitra	2nd	OUP India
2.	The 55 Soft Skills That Guide Employee and Organizational Success	Bob Graham and Tobin Edward Porterfield Kiser Randall		Mason-WEST
3.	Verbal Reasoning, LSAT Material	GL Barrons	14th	Barrons Educational Series
4.	A modern approach to logical Reasoning	R S Agarwal	4th	S.Chand
5.	Quantitative Aptitude	R S Agarwal	4th	S.Chand

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23IT551M	MDM-III Cloud Applications and Development	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
This course is intended • To introduce students to the development of cloud-native applications using modern architectures like microservices and serverless computing. • To provide hands-on knowledge of containerization and orchestration using Docker and Kubernetes. • To enable students to design and implement Continuous Integration and Continuous Deployment with DevOps tools and practices.	**Students will be able to** • To introduce students to the development of cloud-native applications using modern architectures like microservices and serverless computing. • To provide hands-on knowledge of containerization and orchestration using Docker and Kubernetes. • To enable students to design and implement Continuous Integration and Continuous Deployment (CI/CD) pipelines with DevOps tools and practices. • To bridge the gap between application development and operations using automated tools and practices. • To prepare students for industry-oriented deployment and operations workflows in real-world cloud environments.

Unit I: Cloud-Native Application	**[9Hrs]**
Principles of cloud-native applications, Microservices architecture: Design patterns and communication.	
Unit II: Application Development	**[9Hrs]**
Serverless computing: Concepts, benefits, limitations, Event-driven architecture in the cloud, Case studies: AWS Lambda, Azure Functions and Google Cloud Functions.	
Unit III: Containers	**[9Hrs]**
Introduction to containerization: Dockers architecture and commands, Creating and managing container images, Dockers Compose and Dockers Hub.	
Unit IV: Kubernetes	**[9Hrs]**
Introduction to Kubernetes: Pods, Deployments, Services, Kubernetes on cloud: GKE, EKS, AKS, Helm basics for package management	
Unit V: DevOps and CI/CD Pipelines	**[9Hrs]**
DevOps lifecycle and principles, Continuous Integration and Delivery concepts, CI/CD tools: Jenkins, GitHub Actions, GitLab, Deployment strategies: Blue-Green, Canary	

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Cloud Native Java	Josh Long, Kenny Bastani	1st	O'Reilly Media
2.	Docker Deep Dive	Nigel Poulton	4th	Leanpub
3.	Kubernetes Up & Running	Kelsey Hightower, Brendan Burns, Joe Beda	3rd	O'Reilly Media
4.	The DevOps Handbook	Gene Kim, Jez Humble, Patrick Debois, John Willis	2nd	IT Revolution Press

Web Resources:

1	GeeksforGeeks : https://www.geeksforgeeks.org/