2021-2022

21CAP01	CORE: I ADVANCED JAVA PROGRAMMING	SEMESTER	LEVEL
CO1	Outline the concepts of Java Programming Language	1	K1
CO2	Explain the concepts of packages and multithreads, Java collections, Networking , JDBC and Servlets		K2
CO3	Summarizes the concepts of event handling and graphics programming		K3
CO4	Analyze the networking concepts and socket programming		K4
CO5	Applying the java programming techniques for solving the given problem		K5
CO6	Develop simple projects for the real time applications		K6
21CAP02	**CORE: II RELATIONAL DATABASE MANAGEMENT SYSTEM**	**SEMESTER**	**LEVEL**
CO1	Outline the concepts of Java Programming Language	1	K1
CO2	Explain the concepts of packages and multithreads, Java collections, Networking , JDBC and Servlets		K2
CO3	Summarizes the concepts of event handling and graphics programming		K3
CO4	Analyze the networking concepts and socket programming		K4
CO5	Applying the java programming techniques for solving the given problem		K5
CO6	Develop simple projects for the real time applications		K6
21CAP03	**CORE: III COMPUTER NETWORKS**	**SEMESTER**	**LEVEL**
CO1	Describe the concepts, reference models and various layers of computer networks	1	K1
	Explain the v principles, protocols and algorithms of different layers of OSI		

CO2	reference models		K2
CO3	Apply the error detection and correction techniques and routing algorithms for efficient and error free transmission in networks		K3
CO4	Analyze the various routing algorithms for handling internal traffic efficiently		K4
CO5	Illustrate the data transmission services and connection establishment on network		K5
CO6	Create innovative error detection and correction algorithms and routing algorithms for effective data transmission over network.		K6
21CAP04	**CORE: IV OPERATIONS RESEARCH**	**SEMESTER**	**LEVEL**
CO1	outline the meaning, purpose and tools of LPP, assignment, replacement, sequencing and pert model	I	K1
CO2	express the procedures and steps for LPP, assignment, replacement, sequencing and pert model		K2
CO3	illustrate the methodologies to get the optimal solution and the period of replacement		K3
CO4	analyze the concepts of LPP, assignment, replacement, sequencing and pert model		K4
CO5	evaluate different situations after the solution of LPP, assignment, replacement, sequencing and pert problems		K5
CO6	construct LP and Replacement models for various type of problems		K6
21CAP05A	**CORE: V ELECTIVE: I MOBILE COMPUTING**	**SEMESTER**	**LEVEL**
CO1	Explain the features of mobile communication and its services	I	K1
CO2	Identify the features of various technologies		K2
CO3	Classification of Mobile data networks in Mobile Communication		K3
CO4	Analyze network security in communication		K4
CO5	Evaluate the intent based frameworks in an		K5

	application		
CO6	Generate adhoc networks with security		K6
21CAP05B	**CORE: V ELECTIVE: I BUSINESS INTELLIGENCE**	**SEMESTER**	**LEVEL**
CO1	Recall to understand the basics of Business Intelligence	I	K1
CO2	Interpret the concept of Decision Support Systems and Business Intelligence		K2
CO3	Build knowledge on Decision making, systems, modeling and support		K3
CO4	Analyze an insight on Knowledge Management		K4
CO5	Assess Business Intelligence implementation		K5
CO6	Imagine Integration and Emerging Trends		K6
21CAP05C	**CORE: V ELECTIVE: I CLOUD COMPUTING**	**SEMESTER**	**LEVEL**
CO1	Understand the basics of Cloud Computing Working, Benefits	I	K1
CO2	Explain the knowledge of cloud architecture and tools		K2
CO3	Analyze the concepts of cloud computing Services and Security		K3
CO4	Determine the virtualization and data storage in cloud		K4
CO5	Apply the Future Cloud in applications		K5
CO6	Discuss the applications of Cloud computing		K6
21CAP05D	**CORE: V ELECTIVE: I SERVICE ORIENTED ARCHITECTURE**	**SEMESTER**	**LEVEL**
CO1	Describe about evolution, characteristics and services in SOA with SOA architecture, WSDL, SOAP and UDDI.	I	K1
CO2	Explain basic principles of SOA in project solutions that require problem solving, inference, perception, knowledge		K2

	representation, and learning.		
CO3	Illustrate awareness and a fundamental understanding of various applications of SOA & WS techniques in knowledge representation methods and expert systems.		K3
CO4	Analyze the SOA Architectural style, SOA strategies, modeling web services.		K4
CO5	Design, implementing process of SOA in web service.		K5
CO6	Apply the SOA operational style for the web services.		K6
21CAP06	**CORE: VI PRACTICAL: I ADVANCED JAVA PROGRAMMING-PRACTICAL**	**SEMESTER**	**LEVEL**
CO1	Recall the concepts of Java Programming Language	I	K1
CO2	Understand the concepts of packages and multithreads		K2
CO3	Apply JDBC concept for database connectivity		K3
CO4	Analyze the networking concepts in java programming		K4
CO5	Illustrate event handling concepts and servlet		K5
CO6	Develop simple projects for the real time applications		K6
21CAP07	**CORE: VII PRACTICAL: II RELATIONAL DATABASE MANAGEMENT SYSTEM– PRACTICAL**	**SEMESTER**	**LEVEL**
CO1	Relate the basic concepts of relational database system.	I	K1
CO2	Illustrate the features available in a RDBMS package		K2
CO3	Construct appropriate SQL queries and PL/SQL Programs for database application.		K3
CO4	Analyze different database requirements and design effective database.		K4
CO5	Assess data in tables against appropriate constraints.		K5
CO6	Propose solutions to a broad range of real time applications using PL/SQL		K6

21CAP08	CORE: VIII DATA STRUCTURES AND ALGORITHMS	SEMESTER	LEVEL
CO1	Recognize various data structures, algorithms and sorting methods	II	K1
CO2	Visualize the range of data structure and algorithm concepts		K2
CO3	Apply appropriate data structures and algorithm to solve real time applications		K3
CO4	Investigate various data structures and algorithm to uncover optimal solutions for the computational problems		K4
CO5	Justify the relevance of an algorithm for a specific application with respect to space and time complexity		K5
CO6	Devise innovative and efficient data structure and algorithm for solving the complex real time problems		K6
21CAP09	**CORE: IX WEB PROGRAMMING**	**SEMESTER**	**LEVEL**
CO1	Define the basic of Dynamic HTML, Java Script, Perl and PHP	II	K1
CO2	Explain Exception Handling Array, Hashes in Perls		K2
CO3	Choose the best suitable web programming techniques for developing a Personal Blog.		K3
CO4	Make use of Dynamic web pages using Events.		K4
CO5	Discuss on Dynamic content Modifying		K5
CO6	Design and Implement Object Class in Java Script		K6

21CAP10	CORE: X SOFTWARE PROJECT MANAGEMENT	SEMESTER	LEVEL
CO1	Choose the Product Life Cycle model and metrics	II	K1
CO2	Outline the aspects in software project management and software quality assurance		K2
CO3	Model various phases in software and challenges faced during design , development and testing		K3
CO4	Examine the functions of software requirement gathering and cost estimation process		K4
CO5	Evaluate various development techniques and implementation methods		K5
CO6	Build and design real time software projects		K6
21CAP11	**CORE: XI OPERATING SYSTEM**	**SEMESTER**	**LEVEL**
CO1	Outline the Memory Management, Processor Management, Device Management and Information Management	II	K1
CO2	Explain the basic principles of Multiprogramming and Job Scheduling		K2
CO3	Illustrate awareness and a fundamental understanding of various applications used in operating system		K3
CO4	Analyze DOS, Windows 98, Windows NT & Linux		K4
CO5	Apply scientific methods to model Job scheduling		K5
CO6	Demonstrate Memory Management, Processor Management, Device Management and Information Management using various methods		K6

21CAP12A	CORE: XII ELECTIVE: II ARTIFICIAL INTELLIGENCE	SEMESTER	LEVEL
CO1	Outline the fundamental understanding of the history of Artificial Intelligence(AI) and its foundations.	II	K1
CO2	Explain basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.		K2
CO3	Illustrate awareness and a fundamental understanding of various applications of AI techniques in knowledge representation methods and expert systems.		K3
CO4	Analyze AI problems using various search techniques and develop applications in an AI language and expert system shell		K4
CO5	Apply scientific methods to model AI techniques		K5
CO6	Demonstrate AI and its current scope and limitations, and social implications.		K6
21CAP12B	**CORE: XII ELECTIVE: II ADHOC AND SENSOR NETWORKS**	**SEMESTER**	**LEVEL**
CO1	Describtion ofMobile Adhoc and sensor networks	II	K1
CO2	Explain working principles of WSN and Adhoc networks		K2
CO3	Illustrate the sensors and adhoc principles in wireless latest technologies		K3
CO4	Analyze the Adhoc& WSN Architectural style		K4
CO5	Design, implementing process of MANET & WSN		K5
CO6	Apply the MANET & WSN with different algorithms		K6

21CAP12C	CORE: XII ELECTIVE: II DIGITAL IMAGE PROCESSING	SEMESTER	LEVEL
CO1	Define the concepts of digital image processing	II	K1
CO2	Discuss the various image processing methods and image transform formats		K2
CO3	Illustrate sampling, filtering and detection methods		K3
CO4	Analyze the enhancement, segmentation , restoration and compression techniques with denoising		K4
CO5	Summarize the different image processing techniques		K5
CO6	Generalize the overview of image processing techniques with different methods		K6

21CAP12D	CORE: XII ELECTIVE: II VIRTUAL REALITY SYSTEMS	SEMESTER	LEVEL
CO1	Define the Basics and Introduction of Virtual Reality and how VR systems work.	II	K1
CO2	Illustrate the Impressive Virtual Reality Tools		K2
CO3	Choose, develop, experiment, the use of particular designs for VR experiences.		K3
CO4	Summarize, distill, and design a research contribution within academic VR.(Virtual Reality take Part in Classroom , Campus and Industrial Training)		K4
CO5	Evaluate the drawbacks of specific VR techniques on the human body.		K5
CO6	Develop the Running Experiments in Virtual Labs		K6
21CAP13	**CORE: XIII PRACTICAL: III DATA STRUCTURES AND ALGORITHMS USING JAVA - PRACTICAL**	**SEMESTER**	**LEVEL**
CO1	Recall various data structures, algorithms and sorting methods while writing programs	II	K1
CO2	Demonstrate the concepts of data structures and algorithms using Java		K2
CO3	Select appropriate data structure and algorithm to solve a specific problem		K3
CO4	Analyze various algorithms with respect to their computational efficiency		K4
CO5	Justify the application of a specific algorithm to solve the given problem with respect to its space and time complexity		K5
CO6	Develop software in Java using various data structures and algorithms for real time applications		K6

21CAP14	CORE: XIV PRACTICAL: IV WEB PROGRAMMING - PRACTICAL	SEMESTER	LEVEL
CO1	Define the basic of HTML Forms and Controls and validation	II	K1
CO2	Tagging the arithmetic operations, Email Processing in Java Script		K2
CO3	Execute the Data Base Concepts		K3
CO4	Calculate the web page view count using session		K4
CO5	Display the digital clock which displays date and time using Perl Program		K5
CO6	Design and build the server information's		K6
21AEP01	**ABILITY ENHANCEMENT CYBER SECURITY**	**SEMESTER**	**LEVEL**
CO1	Recall the basic concepts of information security and its types	II	K1
CO2	Gain knowledge on cyber space issues and cyber security measures		K2
CO3	Identify various risks and threats in cyber space		K3
CO4	Apply security measures to prevent ourselves from threats in social media		K4
CO5	Compare various social media, security issues and measures		K5
CO6	Propose a secured cyber platform for people to connect each other for their social and professional concerns		K6
21CAP15	**CORE: XV DATA MINING AND BIG DATA ANALYTICS**	**SEMESTER**	**LEVEL**
CO1	Define Data Mining concepts with Hadoop architecture	III	K1
CO2	Explain Data Mining Techniques and Algorithms		K2
CO3	Interpret R Language and Hadoop architecture with algorithms		K3
CO4	Categorize classification, clustering and association rules in data mining		K4
CO5	Estimate Data Mining Algorithms with R language		K5
CO6	Integrate different measures using data mining techniques		K6

21CAP16	CORE : XVI MACHINE LEARNING USING PYTHON	SEMESTER	LEVEL
CO1	Gain knowledge about basic concepts of Machine Learning.	III	K1
CO2	Identify machine learning techniques suitable for a given problem		K2
CO3	Apply suitable machine learning techniques for various applications.		K3
CO4	Compare various supervised and unsupervised learning algorithms		K4
CO5	Assess strengths and weaknesses of popular machine learning approaches.		K5
CO6	Design and implement various machine learning algorithms in a range of real-world applications.		K6
21CAP17	**CORE: XVII NETWORK SECURITY AND CRYPTOGRAPHY**	**SEMESTER**	**LEVEL**
CO1	Define the basics of network security	III	K1
CO2	Summarize the intrusion detection and its solutions to overcome the attacks		K2
CO3	Organize the Asymmetric Key Algorithms and Digital Signatures		K3
CO4	Analyze the knowledge on symmetric key algorithms		K4
CO5	Inspect the concept of digital signature		K5
CO6	Design the Network Security, Firewalls and Virtual Private Networks		K6
21CAP18A	**CORE: XVIII ELECTIVE: III INTERNET OF THINGS**	**SEMESTER**	**LEVEL**
CO1	To identify the vision of IoT and its future roadmap	III	K1
CO2	Understanding the technologies used for IoT applications		K2
CO3	Use IoT to solve real world problems		K3
CO4	Examine the constraints and opportunities of wireless networks for IoT.		K4
CO5	Assess potential security issues and solutions in IoT		K5

CO6	To design new IoT based prototypes for real life situations		K6
21CAP18B	**CORE: XVIII ELECTIVE: III** SOFT COMPUTING	**SEMESTER**	**LEVEL**
CO1	Understand the basics of neural networks	III	K1
CO2	Explain the knowledge on supervised and unsupervised learning		K2
CO3	Apply the concepts of fuzzy logic and fuzzy sets		K3
CO4	Analyze the membership functions and defuzzification		K4
CO5	Illustrate Genetic Algorithm		K5
CO6	Evaluate genetic algorithm		K6
21CAP18C	**CORE: XVIII ELECTIVE: III** THEORY OF COMPUTATION	**SEMESTER**	**LEVEL**
CO1	Relate Regular Languages and Finite Automata	III	K1
CO2	Illustrate Context Free Languages.		K2
CO3	Construct Grammar.		K3
CO4	Classify the Chomsky Classification		K4
CO5	Evaluate Pushdown Automation		K5
CO6	Build adequate knowledge in Turing Machine		K6
21CAP18D	**CORE: XVIII ELECTIVE: III RESEARCH METHODOLOGY**	**SEMESTER**	**LEVEL**
CO1	Recall the concepts of research, limitations of research, purpose of literature review, sources of literature, research problem definition and research design.	III	K1
CO2	Infer research types, need for research design, importance of research design, classifications of research design, report writing.		K2
CO3	Develop research approaches, basic principles of research design, research report, oral presentation.		K3
CO4	Classify research process, literature search procedure, qualitative and quantitative data, data analysis and interpretation.		K4
CO5	Justify data collection, dependent and independent variables, criteria for good		K5

	research, guidelines for oral and written presentation of research findings.		
CO6	Propose a research paper for a scientific journal and develop a testing hypothesis for research.		K6
21CAP19	**CORE: XIX PRACTICAL: V DATA MINING AND BIG DATA ANALYTICS- PRACTICAL**	**SEMESTER**	**LEVEL**
CO1	Recall Data Mining techniques and Hadoop concepts	III	K1
CO2	Clarify Data Mining Techniques and Hadoop framework		K2
CO3	Apply R Language to implement data mining algorithms		K3
CO4	Investigate various classification and clustering algorithm using R language with respect to their computational efficiency		K4
CO5	Determine tools and techniques to analyze Big Data.		K5
CO6	Design software using Data mining algorithms and Big Data Analytics for real time applications using R		K6
21CAP20	**CORE: XX PROJECT: I MINI PROJECT AND VIVA VOCE**	**SEMESTER**	**LEVEL**
CO1	Describe the systematic approach for handling a projects	III	K1
CO2	Illustrate the methodologies and professional way of documentation and communication.		K2
CO3	Demonstrate the key stages in development of the project.		K3
CO4	Analyze the various requirements of the given project		K4
CO5	Evaluate the relevance and level of achievement of project objectives		K5
CO6	Develop innovative thinking and thereby get prepared for main project		K6
21CAP21	**CORE: XXI GREEN COMPUTING**	**SEMESTER**	**LEVEL**
CO1	Label the problems concerning with e-waste and its consequences on environment	III	K1
CO2	Describe the components involved and how effectively we can achieve cost saving without harming environment		K2
CO3	Inspect the procedural aspects towards		K3

	going green.		
CO4	Categorize the means of green compliance		K4
CO5	Specify the certifications necessary for hardware devices		K5
CO6	Assess the green metrics adopt for the entire organization		K6
21PEP01	**SELF STUDY – MANAGEMENT INFORMATION SYSTEM**	**SEMESTER**	**LEVEL**
CO1	Define the concepts of MIS,types of information, support systems, system concepts and organizational learning	III	K1
CO2	Explain organizational functions, decision making systems, system analysis tools, system design and planning		K2
CO3	Develop different classifications and models of MIS, strategies of information systems with concepts of IS		K3
CO4	Classify design methods of decision support systems and its types, structured analysis tools for system development.		K4
CO5	Determine various models of IS, information requirement analysis,testing tools and its working procedures.		K5
CO6	Design and develop MIS model for a company, bank and hotel with real time examples		K6
21CAP22	**CORE: XXII PROJECT: II MAJOR PROJECT AND VIVA-VOCE**	**SEMESTER**	**LEVEL**
CO1	Recall the principles and methodologies of software engineering	IV	K1
CO2	Demonstrate the ability to locate and use technical information from multiple sources.		K2
CO3	Apply the acquired communication, technical and programming skills in the development of the project.		K3
CO4	Analyze a given problem to apply appropriate problem solving methodology		K4
CO5	Validate the feasibility of the project		K5
CO6	Develop real time projects as per industry needs		K6