21ITU01	CORE: I PROGRAMMING IN C	SEMESTER	LEVEL
CO1	Recall the basics of C Tokens, Operators, Array and Files	1	K1
CO2	Summarize the concepts of input and output functions, decision making and looping, string functions, and pointers		K2
CO3	Classify Arrays and functions		K3
CO4	Analyze the functions of Pointers, Structures and files		K4
CO5	Determine the usage of pointers and files		K5
21ITU02	**Core : II PROGRAMMING IN C-PRACTICAL**	**SEMESTER**	**LEVEL**
CO 1	Define the basics of arithmetic operations using C tokens.	1	K 1
CO 2	Choose the True/ False statements for checking ODD / EVEN numbers.		K 2
CO 3	Calculate simple interest, Employee pay Bill, area of shapes and factorial value		K 3
CO 4	Experiment matrix addition		K 4
CO 5	Validating the file operations		K 5
21ITU03	**Core : III DIGITAL COMPUTER FUNDAMENTALS**	**SEMESTER**	**LEVEL**
CO 1	Recall the basic computer components and micro-operations	1	K 1
CO 2	Explain number conversions, Boolean algebra and logic circuits		K 2
CO 3	Utilize the components of register, input/output and Flip flops		K 3
CO 4	Analyze the Boolean expressions using Boolean algebra		K 4
CO 5	Evaluate the storage concepts using digital logic		K 5

21FCU01	FOUNDATION: I ENVIRONMENTAL STUDIES	SEMESTER	LEVEL
CO 1	Define environment, ecosystem, biodiversity, environmental pollution and social issues.		K 1
CO 2	Explain the natural resources, types of ecosystem, geographical classification of India, causes of environmental pollution and the problems related to the society.		K 2
CO 3	Identify the information related to environment and the resources to protect it.		K 3
CO 4	Analyze the classification of natural resources, energy flow in the ecosystem, threats to biodiversity, disaster management and the role of information technology in environment and human health.	1	K 4
CO 5	Assess the environmental issues with a focus on sustainability.		K 5
21ITU05	CORE: V PROGRAMMING IN JAVA	SEMESTER	LEVEL
CO 1	Outline the basic concepts of Java Programming Language		K 1
CO 2	Explain the concepts of tokens, control structures and looping, arrays, applet programming and Exception handling		K 2
CO 3	Apply java programming for practical solutions	II	K 3
CO 4	Analyze wide range of Applications by using java programming		K 4
CO 5	Determine the usage of all given concepts in the development of programming solutions		K 5
21ITU06	CORE: VI PROGRAMMING IN JAVA-PRACTICAL	SEMESTER	LEVEL
CO 1	Outline the basic concepts of Java Programming Language		K 1
CO 2	Explain the concepts of tokens, control structures and looping, arrays, applet programming and Exception handling		K 2
CO 3	Apply java programming for practical solutions	II	K 3
CO 4	Analyze wide range of Applications by using java programming		K 4
CO 5	Determine the usage of all given concepts in the development of programming solutions		K 5

21ITU06	CORE: VII OFFICE AUTOMATION	SEMESTER	LEVEL
CO 1	Utilize the basics options of MS-Word in preparation of documents		K 1
CO 2	Demonstrate the concepts in MS-Word such as Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter.		K 2
CO 3	Apply the various accounting features in MS-Excel, Accessing, overview of toolbars, Saving excel files, Using help and Resources.	II	K 3
CO 4	Analyze the importance of MS-Excel such as Spreadsheet tool		K 4
CO 5	Assess MS-Powerpoint layouts and presentations		K 5

21ITU02	FOUNDATION: II YOGA AND ETHICS	SEMESTER	LEVEL
CO 1	Recollect the basic terminologies in yoga and value education		K 1
CO 2	Demonstrate the importance of yoga, mental exercises, principles of life and components of values.		K 2
CO 3	Apply the techniques of dynamic & mental exercises and philosophical values in real life	II	K 3
CO 4	Classify the different types of asanas, stages of mind, analysis of thought, ethical values and social values.		K 4
CO 5	Evaluate how the yoga and value education make a person strong both physically and mentally		K 5

21ITU09	CORE: IX DATA STRUCTURES	SEMESTER	LEVEL
CO 1	Recall the various data structures, algorithms and sorting methods		K 1
CO 2	Describe the basic concepts of data structures, sorting and symbol table		K 2
CO 3	Use appropriate data structures for varied problems	III	K 3
CO 4	Examine different data structures and algorithms to find best solution for the real time applications		K 4
CO 5	Recommend a specific data structure and sorting algorithm for an application.		K 5

21ITU10	CORE: X WEB TECHNOLOGY	SEMESTER	LEVEL
CO 1	Recall the basic terms in HTML, XML and PHP		K 1
CO 2	Explain the various HTML tags to develop a web page		K 2
CO 3	Apply the CSS to HTML and make your web page more attractive	III	K 3
CO 4	Analyze the usage of script languages in HTML program to make the webpage dynamic		K 4
CO 5	Examine the needs of XML and how it differs from HTML		K 5

21ITU11	CORE: XI WEB TECHNOLOGY PRACTICAL	SEMESTER	LEVEL
CO1	Create a simple webpage using HTML, XML and PHP		K1
CO2	Design a dynamic webpage using various functions		K2
CO3	Apply the script languages to make your webpage more attractive	III	K3
CO4	Analyse the difference between the XML, XML and PHP language		K4
CO5	Develop real time web applications using HTML, XML and PHP		K5

21ITU12	CORE: XII SOFTWARE TESTING	SEMESTER	LEVEL
CO1	Recall the basics concepts of software testing		K1
CO2	Explain the different software testing methods		K2
CO3	Develop various testing levels for different domains	III	K3
CO4	Classify various testing techniques that can be used for software testing		K4
CO5	Decide test plans for real time applications		K5

21NMU01A	CORE:NON MAJOR ELECTIVE I INDIAN WOMEN AND SOCIETY	SEMESTER	LEVEL
CO1	Know women status in Indian society as an academic discipline		K1
CO2	Interpret the various roles of women, challenges and issues faced by them in the society		K2
CO3	Find out solutions to their legal issues and product themselves from the violence against women emphasize on women entrepreneurship for their empowerment	III	K3
CO4	Critically analyze the lifestyle and challenges of women		K4
CO5	Discuss the importance of women health and issues related to women in general		K5

21NMU01A	CORE:NON MAJOR ELECTIVE I INDIAN WOMEN AND SOCIETY	SEMESTER	LEVEL
CO1	Know women status in Indian society as an academic discipline	III	K1
CO2	Interpret the various roles of women, challenges and issues faced by them in the society		K2
CO3	Find out solutions to their legal issues and product themselves from the violence against women emphasize on women entrepreneurship for their empowerment		K3
CO4	Critically analyze the lifestyle and challenges of women		K4
CO5	Discuss the importance of women health and issues related to women in general		K5
21ITU14	CORE:XIV RELATIONAL DATABASE MANAGEMENT SYSTEMS	SEMESTER	LEVEL
CO1	Explain the basic concepts of database system.	IV	K1
CO2	Explain Normalization and Query language.		K2
CO3	Apply appropriate SQL queries and PL/SQL Programs for database application.		K3
CO4	Analyze different normal forms to design effective database design.		K4
CO5	Verify data in tables against appropriate constraints.		K5
21ITU15	CORE:XV SQL AND PL/SQL-PRACTICAL	SEMESTER	LEVEL
CO1	Recall the basic concepts of database system.	IV	K1
CO2	Demonstrate the use of Queries.		K2
CO3	Apply appropriate SQL queries and PL/SQL Programs for database application.		K3
CO4	Examine different looping structures to design effective program		K4
CO5	Assess the data in tables against appropriate constraints.		K5

21ITU16	CORE:XVI OPERATING SYSTEM	SEMESTER	LEVEL
CO1	Recall the fundamental concepts of operating system		K1
CO2	Demonstrate the functions of deadlock and storage management		K2
CO3	Utilize the policies of scheduling	IV	K3
CO4	Analyze memory management		K4
CO5	Evaluate the concepts of storage management		K5
21ITU17	CORE:XVII MICROPROCESSOR AND ASSEMBLY LANGUAGE PROGRAMMING	SEMESTER	LEVEL
CO1	Recall the fundamental concepts of microprocessor		K1
CO2	Demonstrate the functions of 8085		K2
CO3	Identify the internal organization and operation of microprocessors/microcontrollers.	IV	K3
CO4	Analyse the functions of Program 8085 Microprocessor		K4
CO5	Evaluate the microprocessors/microcontrollers-based systems		K5
21SEITU01	CORE:SKILL ENHANCEMENT-I PRACTICAL-V PROGRAMMING IN PHP PRACTICAL	SEMESTER	LEVEL
CO1	Recall the basic concepts of PHP variables		K1
CO2	Illustrate the concepts of control statements, looping statements, arrays		K2

CO3	Build applications using functions, class		K3
CO4	Analyze the usage of scripts	IV	K4
CO5	Examine the use of database connectivity		K5
21AEU02	**CORE:ABILITY ENHANCEMENT:II CONSUMER RIGHTS**	**SEMESTER**	**LEVEL**
CO1	Memorize the procedure of redress of consumer complaints, and the role of different agencies in establishing product and service standards		K1
CO2	Explain the Consumer Protection Law in India		K2
CO3	Impart sound practical grounding about the practice of consumer law and the procedure Followed	IV	K3
CO4	Evaluate the regulations and legal actions that helps to protect consumers		K4
CO5	Analyze the knowledge and skills needed for a career in this field		K5
21ITU19	**CORE: XIX PROGRAMMING IN PYTHON PRACTICAL**	**SEMESTER**	**LEVEL**
CO 1	Recall the syntax and semantics of various programming constructs while writing simple programs		K 1
CO 2	Understand the basic programming concepts of python		K 2
CO 3	Organize data using lists, tuples ,dictionaries and files and program using control structures, functions, class and objects	V	K 3
CO 4	Assume appropriate programming structure and data type to solve the given problem efficiently		K 4
CO 5	Interpret the given problem statement into a python program		K 5

21ITU20	CORE: XX COMPUTER GRAPHICS	SEMESTER	LEVEL
CO 1	Describe the basics of computer graphics		K 1
CO 2	Explain applications, principles, commonly used and techniques of computer graphics and algorithms for Line-Drawing, Circle- Generating and Ellipse Generating.	V	K 2
CO 3	Analyze the attributes of output primitives		K 3
CO 4	Learn and apply two dimensional Geometric Transformations		K 4
CO 5	Examine and appraise the two dimensional viewing		K 5

21ITU21	CORE: XXI MINI PROJECT	SEMESTER	LEVEL
CO 1	Remember the thrust areas of project		K 1
CO 2	Demonstrate the problem pertaining to the domain		K 2
CO 3	Apply various algorithms in their relevant field	V	K 3
CO 4	Explore the real time applications		K 4
CO 5	Evaluate demographic variables and factors influencing software development		K 5

21ITU22A	CORE: XXII DATA MINING	SEMESTER	LEVEL
CO 1	Remember the basics of Data Mining concepts		K 1
CO 2	Explain the techniques of Data Mining		K 2
CO 3	Classify algorithms for mining the data efficiently	V	K 3
CO 4	Analyze clustering techniques and algorithms		K 4
CO 5	Evaluate the challenges of data mining in real world applications		K 5

21ITU22B	CORE: XXII MULTIMEDIA SYSTEMS	SEMESTER	LEVEL
CO 1	Recognize the basic concepts of multimedia		K 1
CO 2	Demonstrate different multimedia content	V	K 2
CO 3	Discover various effect in animated files		K 3
CO 4	Analyze multimedia processing techniques		K 4

CO 5	Determine multimedia requirements for designing		K 5
21ITU22C	**CORE:XXII CLOUD COMPUTING TECHNIQUES**	**SEMESTER**	**LEVEL**
CO1	Recall the basics of Cloud Computing, Working, Benefits and Discovering cloud services.	V	K 1
CO2	Explain the cloud services		K 2
CO3	Apply the concepts of communications and collaboration using cloud		K 3
CO4	Analyse the various cloud services		K 4
CO5	Evaluate the cloud services		K 5
21CSUOE1	**CORE:XXIII INTERNET FOR EVERYONE**	**SEMESTER**	**LEVEL**
CO1	Outline the basic concept of the Internet, World Wide Web and Web browsers	V	K 1
CO2	Explain the Knowledge of Finding Information in the Internet and awareness on Internet Security and Privacy		K 2
CO3	Apply tips for effective use of Email, Advantages and Disadvantages of Email		K 3
CO4	Analyze the Possibilities of Social Networking, Learning discussion forum software & effective use of video conferencing		K 4
CO5	Evaluate the learn Blogging & Making Money in the Internet		K 5
21ITUOE1	**CORE:XXIII BASICS OF COMPUTER TECHNOLOGY**	**SEMESTER**	**LEVEL**
CO1	Recall the basics of Computer	V	K 1
CO2	Illustrate the concepts of data communication and Computer networks		K 2
CO3	Utilize Middleware and Gateways		K 3
CO4	Analyze the concepts of Mobile Computing		K 4
CO5	Examine the DBMS Architecture		K 5

21CAUOE1	**CORE:XXIII MACHINE LEARNING**	**SEMESTER**	**LEVEL**
CO1	Remember the Machine Learning Fundamentals		K 1
CO2	Understanding the machine learning concepts		K 2
CO3	Summarize the impact of machine learning applications	V	K 3
CO4	Analyze machine learning support to business goals		K 4
CO5	Evaluate the knowledge of machine skills		K 5
21SEU02	**LIFE SKILLS**	**SEMESTER**	**LEVEL**
CO1	Identify the common communication problems, what good communication skills are and what they can do to improve their abilities	V	K 1
CO2	Demonstrate communication through the digital media		K 2
CO3	Prepare themselves to situations as an individual and as a team.		K 3
CO4	Analyse various leadership models, strengths and abilities to create their leadership vision		K 4
CO5	Appraise their potential as human beings and conduct themselves properly in the ways of the world.		K 5
21PEITU01	**CASE TOOLS (SELF STUDY)**	**SEMESTER**	**LEVEL**
CO1	Outline the concepts of data modeling and its tools		K 1
CO2	Describe DFD, DDT, U bridge, and UML		K 2
CO3	Analyze real time problems and draw appropriate data modeling diagrams	V	K 3
CO4	Apply the relevant modeling tools to represent the problem using diagrams		K 4
CO5	Assess the software development life cycle with DFD and UML diagrams		K 5

21ITU24	CORE:XXIV MOBILE COMPUTING	SEMESTER	LEVEL
CO1	Outline the emergence of Mobile technology and its architecture	VI	K 1
CO2	Identify the features of various technologies		K 2
CO3	Apply the knowledge on mobile computing through telephony		K 3
CO4	Examine different Mobile networks		K 4
CO5	Determine data services in mobility		K 5

21ITU25	CORE:XXV PROGRAMMING IN VB.NET	SEMESTER	LEVEL
CO1	Outline the basic concepts of .Net Frame work, class and objects	VI	K 1
CO2	Explain the concepts of data types, control statements, looping statements, arrays, structures, procedures and functions		K 2
CO3	Illustrate the importance of windows form, interfaces, packages, inheritance and exception handling		K 3
CO4	Analyze the various .NET controls and database controls		K 4
CO5	Evaluate the use of ADO.Net connection		K 5

21ITU26	CORE:XXVI PROGRAMMING IN VB.NET - PRACTICAL	SEMESTER	LEVEL
CO1	Recall the basic concepts of class and objects using console application	VI	K 1
CO2	Illustrate the concepts of data types, control statements, looping statements, arrays, structures, procedures and functions using programs		K 2

CO3	Build applications using windows form, interfaces, packages, inheritance and exception handling			K 3
CO4	Analyze the usage of various .NET controls			K 4
CO5	Examine the use of ADO.Net connection for real world applications			K 5
21ITU27A	**CORE:XXVII BIG DATA ANALYTICS**	**SEMESTER**		**LEVEL**
CO1	Recall the definitions in Big Data and Data Analytics			K 1
CO2	Explain NoSQL, Hadoop and Map Reduce Concepts with algorithms			K 2
CO3	Apply Data Stream Management, Frequent Itemset Mining in clustering techniques	VI		K 3
CO4	Analyze Big Data Challenges, link analysis and Recommendation systems			K 4
CO5	evaluate Hadoop architecture and types of Big Data approach			K 5
21ITU27B	**CORE:XXVII NETWORK SECURITY**	**SEMESTER**		**LEVEL**
CO1	Recall the various definitions involved in Symmetric Encryption	VI		K 1
CO2	Illustrate various Public key cryptographic techniques			K 2
CO3	Experiment with Secure Socket Layer			K 3
CO4	Examine authentication applications			K 4
CO5	Sketch IP Security and web Security			K 5
21ITU27C	**CORE:XXVII INFORMATICS**	**SEMESTER**		**LEVEL**
CO1	Recall the special terms in Basics of Informatics			K 1
CO2	Demonstrate security and Ethics issues related to informatics.	VI		K 2

CO3	Apply technology informatics skills to solve specific industry data and information management problems, with a focus on usability and designing for users.		K 3
CO4	Ideate informatics products and services.		K 4
CO5	Conduct informatics Analysis and visualization applied to different real-world fields.		K 5
CO6	Develop electronic record programs and applications in a specific organizational setting		K 6
21ITU28	**CORE:XXVIII ARTIFICIAL INTELLIGENCE**	**SEMESTER**	**LEVEL**
CO1	Outline the basic AI problems, techniques and knowledge representation issues		K 1
CO2	Explain the AI problem designs and issues, heuristic techniques and knowledge representation methods		K 2
CO3	Apply first order predicate logic rules to solve AI problems	VI	K 3
CO4	Analyze AI problems using various search techniques		K 4
CO5	Compare procedural and declarative knowledge representation methods		K 5
21ITU28B	**CORE: XXVIII** **ELECTIVE: III CLUSTER COMPUTING**	**SEMESTER**	**LEVEL**
CO1	Recall the important terms in cluster computing		K 1
CO2	Explain the role of cluster middleware		K 2
CO3	Experiment with the cluster programming and Environment Tools	VI	K 3
CO4	Analyze and assess the performance of cluster computing		K 4
CO5	Evaluate the Performance of cluster systems		K 5

21ITU28C	CORE:XXVIII ELECTIVE:III GREEN COMPUTING	SEMESTER	LEVEL
CO1	Label the problems concerning with e-waste and its consequences on environment	VI	K 1
CO2	Describe the components involved and how effectively we can achieve cost saving without harming environment		K 2
CO3	Inspect the procedural aspects towards going green.		K 3
CO4	Categorize the means of green compliance		K 4
CO5	Specify the certifications necessary for hardware devices		K 5
CO6	Label the problems concerning with e-waste and its consequences on environment		K6

21SEITU03	SKILL ENHANCEMENT:III DIGITAL MARKETING	SEMESTER	LEVEL
CO1	Remember the important terminologies in digital marketing	VI	K 1
CO2	Illustrate the role of Digital Marketing		K 2
CO3	Apply various digital marketing options		K 3
CO4	Analyze Return on Investment for any digital marketing program.		K 4
CO5	Evaluate the Key Performance Indicators tied to any digital marketing program.		K 5