Department of Computer Technology

Course Outcomes Articulation Matrix

Session 2024-2025

Sr. No.	Sem	Course Code	Subject	Course Outcomes	Pos 1	2	3	4	5	6	7	8	9	10	11	PSOs PSO1	PSO2
Semester I (2023 SoE)																	
1	I	23GE1103	Differential Equations and Complex Analysis	Use appropriate Methods to solve first order and higher order differential equations and apply it to find solutions of engineering	2	2	2						1		1		
				Use appropriate methods to solve partial differential equations.	2	2	2						1		1		
				Determine the various functions of complex numbers.	2	2							1		1		
				Evaluate the integration of function of complex variables.	2	2							1		1		
				Avg	2	2	2						1		1		
2	I	23GE1110 23GE1111	Applied Physics, Applied Physics Lab	Co-relate fundamentals of quantum mechanics to solve problems dealing with quantum particle.	2	2									1		
				Justify the characteristics of semiconductor materials in terms of crystal structures, charge carriers and energy bands.	2	2									1		
				Analyze the motion of electron in electric field and magnetic field and its applications to electron optic devices.	3	3									1		
				Examine the intensity variation of light due to laser and its applications.	3	3									1		
				Illustrate the working principle of optical fibre for their use in the field of industry.	2	2									1		
				Avg	2.4	2.4									1		
3	I	23ME1101 23ME1102	Engineering Graphics,Engineering Graphics Lab	Construct orthographic drawing and isometric drawing of a given object	3	2			3			2	3		3		
				Evaluate Projections of various One Dimensional, Two dimensional, Three dimensional objects	3	2			3			2	3		3		
				Develop the lateral surfaces of various solids and their section.	3	2			3			2	3		3		
				Practice the use of software tools used for Two dimensional drawings.	3	2			3			2	3		3		
				Avg	3	2			3			2	3		3		
4	I	23EL1101	Basic Electrical and Electronics Engineering	Understand, define and explain the fundamental concepts of Analog Electronic and Electrical Circuits	1	1											
				Apply the concepts of Electrical and Electronic Circuits to obtain the desired parameter	3	3	2										
				Analyze Analog Electrical and Electronic Circuits to arrive at suitable Conclusions.	2	2	3										
				Design simple circuits using fundamentals of analog Electrical and Electronic circuit for given application.	2	2	3										
				Avg	2	2	2.7										
5	I	23CT1103	Lab : Computer WorkShop	Understand the fundamentals of computer hardware and working of Linux operating system	2				3						3	2	
				Use Linux commands to manage files and file systems	2				3						3	2	
				Execute Scripts and C Programs	3				3						3	3	2
				Debug Programs on various IDEs	3				3						3	3	3
				Avg	**2.5**				**3**						**3**	**2.5**	**2.5**
6	I	23CT1101	Introduction to Logic Building and Programming,	**Explain** the fundamental components of a computer system, the process of program execution, and basic programming concepts	3				2						3	3	
				Develop and implement structured programs using decision control and looping statements to solve real-world problems.		3	3	2	3						2		3
				Apply concept of modular programs, arrays, structures, and pointers to enhance code reusability and efficiency.		2	3	2	3						3		3
				Avg	**3**	**3**	**3**	**2**	**3**						**3**	**3**	**3**
		23CT1102	Introduction to Logic Building and Programming Lab	Apply fundamental programming concepts, including variables, data types, and arithmetic operations, to develop basic programs	3	1			3						2		
				Implement decision-making and iterative control structures to solve computational problems efficiently.	3	3			3						2		
				Develop programs using arrays and functions to perform data manipulation and problem-solving tasks.	3	1	3		3						3		
				Avg	**3**	**2**	**3**		**3**						**2**	**#DIV/0!**	**#DIV/0!**
Semester II (2023 SoE)																	
				Apply the knowledge of differentiation to solve the Engineering problems.	2	2							1		1		
				Determine the derivatives of functions of several variables and develop the relations among the derivatives of variables	2	2							1		1		

7		23GE1201	Calculus and Vector	Apply the knowledge of Beta and Gamma functions to find area, volume and mass and evaluate the multiple	2	2	2						1		1		
				Discuss calculus of scalar and vector point function and use appropriate theorems to evaluate integral of functions of single	2	2	2						1		1		
				Avg	2	2	2						1		1		
8		23GE1206 23GE1207	Engineering Chemistry,Engineering Chemistry Lab	Illustrate qualitative and quantitative aspects of water for industrial and domestic applications.	2	2							1		1		
				Apply concepts of electrochemistry for energy storage devices and corrosion.	3	2							1		1		
				Explain basic principles of spectroscopy and its applications.	2	2							1		1		
				Establish insight into advanced engineering materials.	2	2							1		1		
				Avg	2.3	2							1		1		
9		23GE1212	Professional Communication	Apply different modes of effective communication									3		3		
				Produce competently the Phonology of English Language									3		3		
				Apply the nuances of LSRW Skills								3	3		3		
				Practice communication through different channels								3	3		3		
				Avg								3	3		3		
10		23GE1215	Indian Knowledge System	Apply primary requirements pertaining towards awareness of Indian Knowledge System.						2					2		
				Analyze various Indian society, culture and literature to enhance their traditions						2					2		
				Evaluate structure of Indian art.										2	2		
				Understand Indian heritage and architectural skills										2	2		
				Avg						2				2	2		
11		23CV1201 23CV1202	Engineering Mechanics, Engineering Mechanics Lab	Describe the fundamental concepts of statics and dynamics.	3	3					2	2	2	2			
				Apply the basic concepts of applied mechanics for solution of problems on planar force system	3	3					2	2	2	2			
				Determine the properties of surface like centroid, moment of inertia, etc. for planar surfaces and mass moment of inertia for	3	3					2	2	2	2			
				Analyze pin jointed truss frame structure and beam structure analytically and graphically	3	3					2	2	2	2			
				Evaluate the dynamic variables of kinetics of particles and simple lifting machine	3	3					2	2	2	2			
				Avg	3	3					2	2	2	2			
12		23CT1204	Object Oriented Programming	**Understand** the concept of various programming paradigms	2										3		
				Apply C++ language features to solve given problem	3	3	3								3	3	
				Apply the concepts of object-oriented programming for implementing given problem	3	3	3					2			3	3	
				Avg	2.7	3	3								3	3	
13		23CT1205	Lab: Object Oriented Programming	**Implement** fundamental object-oriented programming concepts such as encapsulation, access specifiers, constructors, destructors,	3	3	3		3				3			3	
				Implement advanced OOP principles including inheritance (single, hierarchical, and hybrid), friend functions, function	3	3	3		3			3	3			3	
				Avg	3	3	3		3			3	3			3	
Semester III (2023 SoE)																	
14		23GE1301	Fundamentals of Management & Economics	Interpret Legal provision and various Principles of Management	2						2				2		
				Classify the working of Human Resource and Financial Management in the organization.	2						2				2		
				Illustrate the Procedure and methods of Project Management	2						2				2	2	2
				Analyse techniques of marketing of goods and services	2						2				2		
				Avg	2						2				2	2	2
15		23CT1301	Lab : Web Technology	Understand various internet technologies	3	3	2	2					2			3	2
				Design the web pages using HTML and CSS	3	3	3	2					2			3	3
				Implement the XML technology to store the data	3	3	2	3					3			3	3

				Develop the interactive web pages using JavaScript	3	3	3	3				2	3	2		3	3
				Avg	3	3	2.5	2.5				2	2.5	2		3	2.75
16		23CT1302	Data Structures	Understand the fundamental concepts of linear and non-linear data structures	3										3	3	3
				Apply appropriate linear data structures to develop algorithms for solving computational problems.	3	3	2								3	3	3
				Demonstrate the use of non-linear data structures like trees and graphs for solving given problems	3	3	2								3	3	3
				Analyse the given real-world computational problems to determine and use the appropriate data structures for effective	3	3	2								3	3	3
				Avg	3	3	2								3	3	3
17		23CT1303	Lab : Data Structures	Implement the concepts of linear and non linear data structures to solve the given problem	3	3	3		3				2		3	2	3
				Apply the concepts of advanced non linear data structures to solve the given problem.	3	3	3		3				2		3	2	3
				Avg	3	3	3		3				2		3	2	3
18		23CT1304	Computer Architecture and Organization	Demonstrate understanding of computer system concepts and apply this knowledge to explain the functionalities of the CPU,	3	2									3		2
				Analyze the stages of instruction execution and evaluate the design principles of arithmetic operations and processor		3	2								3		2
				Design of adders, organization of memory, other peripheral devices, and estimate the cost of computation.		3	2								3		2
				Avg	3	2.7	2								3		2
19		23CT1305	Discrete Mathematics and Probability Theory	Analyze and express logic sentence in terms of predicates, quantifiers, and logical connectives.	3	2		2				1	2		2	1	1
				Derive the solution for a given problem using deductive logic and prove the solution based on logical	3	2		2				1	2		2	1	1
				Classify algebraic structure for a given mathematical problem	3	2		2				1	2		2	1	
				Perform combinatorial analysis to solve counting problems.	3	2		1				1	2		2	1	
				Develop the given problem as graph networks and solve with techniques of graph theory.	3	2		3				1	2		2	1	
				Avg	3	2		2				1	2		2	1	1
20		23CT1306	Cyber Laws	Identify and explain international and national legal frameworks governing cyberspace.	3	1		2		2					2		
				Demonstrate familiarity with legal terminology commonly used in cyber law and technology-related legal discussions.	3									2	3		
				Identify different types of cybercrime and understand relevant laws and regulations for investigating and prosecuting cyber offenses.	3	2		2		3					2		2
				Avg	3	1.5		2		2.5					2.3		2
21		23CT1307	Lab : Data Collection/Web-site/App designing for NGOs and report submission	Gain an understanding of rural life, Indian culture and ethos and social realities						3	2						
				Develop a sense of empathy and bonds of mutuality with the local community								3	2				3
				Appreciate significant contributions of local communities to Indian society and economy						3				2			
				Learn to value the local knowledge and wisdom of the community							3	2					3
				Identify opportunities for contributing to the community's socio-economic									3		2		
				Avg						3	2.5	2.5	2.5	2	2		3
Semester IV (2023 SoE)																		
22		23GE1403	Linear Algebra	Solve systems of linear equations using rank of matrix	2	2								1		1	
				Determine eigen values and eigen vectors and solve eigen value problems.	2	2								1		1	
				Explain the concepts of vector space and subspace, span and basis.	2	2								1		1	
				Apply principles of matrix algebra to linear transformations and inner product.	2	2								1		1	
				Avg	2	2								1		1	
23		23CV1411	Environmental Sustainability, Pollution and	Gain insights into the efforts to safeguard the Earth's environment and resources	2					2	2	2	2	2		2	
				Develop a critical understanding of the contemporary environmental issues of concern	2					2	2	2	2	2		2	
				Have an overview of pollution, climate change and national and global efforts to address adaptation and mitigation to changing	2					2	2	2	2	2		2	

			Management	Learn about the major international treaties and our country's stand on and responses to the major international agreements.	2					2	2	2	2	2		2	
				Avg	**2**					**2**	**2**	**2**	**2**	**2**		**2**	
24		**23CT1401**	**Operating systems**	Describe the different services provided by Operating System at different level.	3	2									2	2	
				Apply knowledge of different operating system algorithms to solve a given problem	3	2									2	2	
				Analyze various approaches used to improve system performance	3	2									2	2	
				Differentiate various disk scheduling algorithms based on their performances.	3	2									2	2	
				Avg	**3**	**2**									**2**	**2**	
25		**23CT1402**	**Lab:Operating systems**	Demonstrate the ability to execute Linux process management, memory management, and shell commands to manage system	3	3	3								2	2	
				Design and implement process scheduling, memory allocation, and deadlock detection algorithms to address real-world operating system challenges.	3	3	3								2	2	
				Develop programs utilizing system calls, thread programming, and page replacement algorithms to simulate and analyze operating system functionalities.	3	3	3								2	3	
				Avg	**3**	**3**	**3**								**2**	**2.333**	
26		**23CT1403**	**Design and Analysis of Algorithms**	Apply asymptotic notations to determine the time complexity of given algorithms.	3	3									3		3
				Use various techniques to solve recurrences	3	3									3		
				Apply various algorithmic strategies to solve given problem and analyze the time complexity	3	3	3	2							3		3
				Compare the different complexity classes and classify algorithms into their respective complexity categories.		2									2		3
				Avg	**3**	**2.8**	**3**	**2**							**2.8**		**3**
27		**23CT1404**	**Lab: Design and Analysis of Algorithms**	Implement and analyze the time complexity of various sorting algorithms	3	3	3	3	3						2	3	3
				Implement recursive and dynamic solution to a given problem and analyze the time and space complexity	3	3	3	3	3						2	3	3
				Implement greedy and backtracking strategy to given problem and analyze the time and space compelexity	3	3	3	3	3						2	3	3
				Avg	**3**	**3**	**3**	**3**	**3**						**2**	**3**	**3**
28		**23CT1405**	**Lab: Data Analysis using R**	To Implement the data import, export, prepare using R for effective data analysis	3	3	3						2			3	3
				To implement the statistical techniques and visualization techniques to analyze the data for exploratory purposes	3	3	3	3	3				2			3	3
				Avg	3	3	3		3				2			3	3
29		**23CT1406**	**Lab : Python**	Select and utilize an appropriate Python framework to develop efficient and structured applications based on user requirements.	3	3	3	2	3			2	2		2	3	3
				Demonstrate skill for effective usage of file handling and concepts of classes and objects.	3	2	2					2	2		2	3	3
				Develop advanced applications using functionalities provided under various packages of python	3	3	3	3	3			2	2		3	3	3
				Avg	3	2.7	2.7	2.5	3			2	2		2.3	3	3
Semester V (SoE 2022 SOE)																		
30		**22CT501**	**Design & Analysis of Algorithms**	Apply asymptotic notations to determine the time complexity of given algorithms.	3	3									3		3
				Use various techniques to solve recurrences	3	3									3		
				Analyze different algorithms, including divide and conquer, greedy methods, dynamic programming, and backtracking	3	3	3	2							3		3
				Compare the different complexity classes and classify algorithms into their respective complexity categories.		2									2		3
				Avg	**3**	**2.8**	**3**	**2**							**2.8**		**3**
31		**22CT502**	**Design & Analysis of Algorithms Lab**	Implement and analyze the time complexity of various sorting algorithms	3	3	3	3	3						2	3	3
				Implement recursive and dynamic solution to a given problem and analyze the time and space complexity	3	3	3	3	3						2	3	3
				Implement greedy and backtracking strategy to given problem and analyze the time and space compelexity	3	3	3	3	3						2	3	3

				Avg	**3**	**3**	**3**	**3**	**3**						**2**	**3**	**3**
32		22CT503	Language Processor	Discuss the different phases and passes of the compiler and demonstrate the use of compiler tools effectively.	3	3			3						3	3	
				Describe the implementation of symbol tables and various methods for error detection and recovery in compilers.	3	3	3	3	3						3	3	
				Implement top-down and bottom-up parsing techniques in compiler design.	3	3	3	3	3	3					3	3	
				Generate intermediate code using Syntax Directed Translation Schemes .	3	3	3	3	3	3					3	3	
				Apply various code optimization techniques to produce optimized code.	3	3	3	3	3	3					3	3	
				Avg	**3**	**3**	**3**	**3**	**3**	**3**					**3**	**3**	
33		22CT504	Language Processor Lab	Implement lexical analyzer using FLEX tool	3	3	3	3	3						3	3	
				Implement syntax analyzer using YACC tool.	3	3	3	3	3						3	3	
				Avg	**3**	**3**	**3**	**3**	**3**						**3**	**3**	
34		22CT505	Software Engineering	Categorize software engineering process models, incorporating requirement engineering principles and software design	3	3									3	3	
				Apply testing principles by selecting and using appropriate testing strategies to effectively evaluate a specific application	3	2										3	
				Use fundamental concepts of software configuration management, version control, and change management in	2	2										2	
				Analyse cost estimation, effort, and the severity of software risk for a given application.	2			3	3							3	
				Interpret the effectiveness of basic operations in Subversion (SVN) for maintaining efficient software version control.					3							3	
				Avg	**2.5**	**2.3**		**3**	**3**						**3**	**2.8**	
35		22CT506	Lab: Software Engineering	Categorize software engineering process models, incorporating requirement engineering principles and software design	3	3	3								3	3	
				Apply testing principles by selecting and using appropriate testing strategies to effectively evaluate a specific application	3	3	3									3	
				Use fundamental concepts of software configuration management, version control, and change management in	3	3	3									3	
				Analyse cost estimation, effort, and the severity of software risk for a given application.	3	3	3									3	
				Interpret the effectiveness of basic operations in Subversion (SVN) for maintaining efficient software version control.	3	3	3								3	3	
				Avg	**3**	**3**	**3**								**3**	**3**	
36		22CT507	Network Security	Understand and classify the various threats to network security, associated attacks, and suggest appropriate countermeasures.	3	3				1	1				3		3
				Solve different cryptographic algorithms using appropriate mathen	3	2					1						3
				Apply various algorithms/ mechanisms to formulate appropriate solution.	3	3				1	1				3	2	3
				Use of different security protocols at various networking layers.	3	2				1	1				3	2	3
				Avg	**3**	**2.5**				**1**	**1**				**3**	**2**	**3**
37		22CT511	PE I:Lab: Mobile Operating System	Apply Kotlin programming concepts to develop basic Android applications.	3	3	3	3	3						3	3	
				Analyze and integrate databases, APIs, and third-party libraries for enhanced app functionality.	3	3	3	3	3						3	3	
				Design and implement intuitive user interfaces using XML and Jetpack Compose.	3	3	3	3	3						3	3	
				Avg	3	3	3	3	3						3	3	
38		22CT515	PE I: Lab: Parallel Programming	Analyze and configure the specifications of their personal computing devices and implement basic multithreading programs	3	3	3	3				3	3	3		3	3
				Apply parallel programming techniques using threads and OpenMP to solve computational problems efficiently and	3	3	3	3				3	3	3		3	3
				Avg	3	3	3	3				3	3	3		3	3
39		22CT513	PE I: Lab:Advanced Web Technologies	Apply fundamental web development technologies, including HTML, CSS, and JavaScript.	3	3	3		3				3			3	3
				Implement interactive web functionalities using JavaScript, AJAX, and session management techniques.	3	3	3	3	3				3			3	3
				Develop and deploy web applications incorporating validation, Bootstrap, and REST APIs.	3	3	3	3	3				3			3	3
				Avg	3	3	3	3	3				3			3	3
40		22CT508	Industrial training, Seminar & Report	Provide students an insight regarding internal working of companies in a team	3								2				
				Understanding of project and product management	3										2		
				Understand the importance of communication, and employment practices	3							2		2			

				Avg	3							2	2		2		
Semester VI (SoE 2022 SOE)																		
41		**22CT601**	**Artificial Intelligence**	Understand the Fundamentals of AI	3	3	2	2							3	3	3
				Apply searching techniques for problem-solving and planning	3	3	2	2							2	3	3
				Analyze the role of knowledge-based agents in AI	3	3	2	2							2	3	3
				Examine techniques of uncertainty for solving AI problems and expert systems	3	3	2	2							2	3	3
				Avg	**3**	**3**	**2**	**2**							**2.3**	**3**	**3**
42		**22CT602**	**Artificial Intelligence Lab**	Apply different searching techniques to solve the given problem.	3	3	3	3							2	3	3
				Apply different knowledge representation techniques on given facts	3	3	3	3							2	3	3
				Implement the concept of uncertainty to solve a given problem	3	3	3	3							2	3	3
				Avg	**3**	**3**	**3**	**3**							**2**	**3**	**3**
43		**22CT603**	**Digital Image Processing**	Understand and describe the basic relationships between pixels	3			2							2	3	3
				Apply various image enhancement techniques in the spatial and frequency domains	3	2	3	2	3						2	3	3
				Demonstrate the applications of similarity based and dissimilarity-based approaches for image segmentation.	3	2	3	2	3						2	3	3
				Analyse different image compression techniques, to understand the benefits of image compression	3	2	3	2	3						2	3	3
				Evaluate the effectiveness of various representation techniques.	3	2	3	2	3						2	3	3
				Avg	**3**	**2**	**3**	**2**	**3**						**2**	**3**	**3**
44		**22CT604**	**Lab: Digital Image Processing**	Demonstrate the ability to perform image processing tasks, including RGB plane separation, color-to-grayscale conversion,	3	2	3	2	3				2		2	3	3
				Apply advanced techniques in image compression, such as Huffman coding and LZW, and implement edge detection	3	2	3	2	3				2		2	3	3
				Develop digital Image Processing solution for real life problems	3	2	3	2	3		2		2		2	3	3
				Avg	**3**	**2**	**3**	**2**	**3**		**2**		**2**		**2**	**3**	**3**
45		**22CT605**	**Distributed Systems and Cloud Computing**	Understand the techniques, tools, skills in a secured cloud environment.	3				3						3		
				Apply distributed computational model and understand the need for cloud computing.	3	3			3	2					3		
				Analyze the need for virtualization in a cloud environment and apply it in compute, memory and storage levels.	3				3				3	3	3	3	
				Design a cloud-based system, process, component, or program to meet desired needs.	3	2	3	2	3						3	3	
				Avg	**3**	**2.5**	**3**	**2**	**3**						**3**	**3**	
46		**22CT606**	**Lab: Distributed Systems and Cloud Computing**	Understand the key principles of Distributed Systems and Cloud Computing, including synchronization, concurrency,	3	3			3						3	3	3
				Design and implement distributed algorithms, inter-process communication, and cloud-native applications using modern tools	3	3	3		3		3		2		3	3	3
				Analyze the performance, scalability, and fault tolerance of distributed and cloud-based systems.	3	3			3				2		3	3	3
				Apply security principles in cloud and distributed environments while staying updated with emerging trends and technologies.	3	3			3		3		2		3	3	3
				Avg	**3**	**3**	**3**		**3**		**3**		**2**		**3**	**3**	**3**
47		**22CT611**	**Professional Elective-II-: Software Testing,**	Understand the foundational concepts of software testing, including error classification, testing objectives, test case	3	2			3						2		
				Apply unit testing and control flow testing techniques, such as static and dynamic testing, mutation testing, path coverage, and	3	3			3						3		
				Analyze system integration and data flow testing strategies to address interface errors and ensure seamless integration of		3		3	3	3							
				Design comprehensive test cases for system testing, including functionality, performance, scalability, and regression testing,			3		3				3		3	3	2
				Avg	**3**	**2.7**	**3**		**3**	**3**			**3**			**3**	**2**
48		**22CT612**	**Lab: Software Testing**	Implement Unit Testing Techniques: Apply systematic methods to test individual components of software to ensure correctness	3	3	3	3				3	3	3		3	2
				Design and Evaluate Test Cases: Develop structured test scenarios and assess their effectiveness in identifying defects and	3	3	3	3				3	3	3		3	2
				Avg	**3**	**3**	**3**	**3**				**3**	**3**	**3**		**3**	**2**
49		**22CT613**	**Professional Elective-II**	Understand the core concepts, architecture, enabling technologies, and applications of the Internet of Things (IoT),	3		3	3	3						3	3	3
				Illustrate the concept of cloud computing framework in IoT environments	3		3	3	3						3	3	3

			Internet of Things	Apply IoT communication protocols and wireless sensor networks to address interoperability, machine-to-machine	3	3	3	3	3						3	3	3
				Avg	3	3	3	3	3						3	3	3
50		**22CT614**	**Lab: Professional Elective-Lab Internet of Things**	Implement proficiency in programming Arduino Uno for IoT applications, utilizing various sensors to collect, process, and	3	3	3	3	3							3	3
				Demonstrate the ability to interface various sensors with a microcontroller, and implement communication protocols	3	3	3	3	3							3	3
				Design IoT-based solutions for real-life applications by integrating sensors, actuators, and communication technologies to	3	3	3	3	3							3	3
				Avg	**3**	**3**			**3**							**3**	**3**
51		**22CT615**	**Professional Elective-II-Business Intelligence,**	Understand the basic concepts of Business Intelligence, digital data types, multidimensional modelling and its applications in	3	3										3	3
				Apply the ETL process to absorb the data in MDDM and statistical technique to understand data.		3	3									3	3
				Analyze the data to identify digital data types, multidimensional schema and hidden pattern from data.	3	3	3									3	3
				Design the MDDM and reports using the business concepts.		3	3	3								3	3
				Avg	3	3	3	3								3	3
52		**22CT616**	**Lab Business Intelligence**	Apply the ETL process to absorb the data in MDDM and statistical technique to understand data	3	3	3		3		3	3	3		3	3	3
				Design the MDDM and reports using the business concepts	3	3	3		3		3	3	3		3	3	3
				Avg	3	3	3		3				3		3	3	3
53		**22CT607**	**Project Phase I**	Identify a problem, analyze research gaps through a literature survey, and propose an ethical, innovative solution with societal impact.	3	3	3	3	3	3	3	3	3	3	3		2
				Analyze the problem and identify suitable tools and technologies for finding solution to the problem.	3	3	3	3	3	3	2	3	3	3	3	3	3
				Communicate proposed solution effectively with proper presentation methods.	3	3			3			3	3	3	3		3
				Avg	**3**	**3**	**3**	**3**	**3**	**3**	**2.5**	**3**	**3**	**3**	**3**	**3**	**2.6667**
Semester VII (SoE 2020)																			
54		**CT2401**	**Artificial Intelligence,**	Understand the Fundamentals of AI	3	3	2	2							3	3	3
				Apply searching techniques for problem-solving and planning	3	3	2	2							2	3	3
				Analyze the role of knowledge-based agents in AI	3	3	2	2							2	3	3
				Examine techniques of uncertainty for solving AI problems	3	3	2	2							2	3	3
				Avg	**3**	**3**	**2**	**2**							**2.3**	**3**	**3**
55		**CT2402**	**Lab: Artificial Intelligence**	Apply different searching techniques to solve the given problem.	3	3	3	3							2	3	3
				Apply different knowledge representation techniques on given facts	3	3	3	3							2	3	3
				Implement the concept of uncertainty to solve a given problem	3	3	3	3							2	3	3
				Avg	**3**	**3**	**3**	**3**							**2**	**3**	**3**
56		**CT2403**	**Network Security**	Identify threats to network security, associated attacks and countermeasures against attack.	3	3				2						2	
				Use appropriate mathematical techniques in cryptography	3			3	2							3	2
				Apply various algorithms/ mechanisms to formulate appropriate solution.		3	3	3								3	3
				Use of different security protocols at various networking layers.	3				3	2					3	3	3
				Avg	3	3	3	3	2.5	2					3	2.75	2.6667
57		**CT2411**	**PE III: Neural Network and Fuzzy Logic**	Understand the fundamentals of Artificial Neural Network and Fuzzy Logic	3										2		3
				Apply the concepts of Artificial Neural Network and Fuzzy Logic for the given scenario	3			3	2						2	3	3
				Design single layer and multilayer neural networks for the given problem definition	3	2		3							2		3
				Avg	3	2		3	2						2	3	3
				Understand the issues and challenges in design of wireless ad hoc networks.	3		3								3	2	3
				Analyze proposed protocols at MAC and routing layers of ad hoc networks.	3	3	3								3		3

58		**CT2412**	**PE III: ADHOC Wireless Network**	Analyze attacks pertaining to network layer.	3	3					2				3	2	3
				Evaluate the energy management schemes and Quality of service solution in ad hoc networks	3										3		3
				Avg	3	3	3				2				3	2	3
59		**PE3:CT2415**	**PE III: Business Intelligence**	Understand the basic concepts of Business Intelligence, digital data types, multidimensional modelling and its applications in	3	3										3	3
				Apply the ETL process to absorb the data in MDDM.		3	3	3								3	3
				Analyze the data to identify digital data types and multidimensional schema.	3	3	3									3	3
				Design the MDDM and reports using the business concepts.		3	3	3								3	3
				Avg	3	3	3	3								3	3
60		**CT2425**	**PE IV: Machine Learning**	Understand the fundamental principles of machine learning and design methods	3										3	3	3
				Apply various machine learning algorithms on a given problem and interpret the results.	3	3		3	3						3	3	3
				Analyze the use of different machine learning for a given real life problems.		3	3	3							3	3	3
				Evaluate the performance of various machine learning algorithms on different datasets of a Domain		2	3								3	3	3
				Avg	3	2.7	3	3	3						3	3	3
61		**CT2427**	**PE IV: ,Lab Machine Learning**	Implement various machine learning algorithms on a given dataset using modern tools and write a report.	3	3	3	3				3	3	3		3	3
				Formulate machine learning problems through investigation and analysis of data to design a solution.	3	3	3	3				3	3	3		3	3
				Avg	3	3	3	3				3	3	3		3	3
62		**CT2491**	**PE IV: JAVA Full Stack**	Understand the process of deployment of application on cloud	3	2	3									3	
				Apply the concepts related to OOP, advance Java features and database connectivity	3	3	3									3	
				Avg	3	2.5	3									3	
63		**CT2493**	**JAVA Full Stack Lab**	To Implement the concept of object oriented programming	3	3	3						2			3	
				To implement the concept of java full stack development	3	3	3		3				2			3	
				Avg	3	3	3		3				2			3	
64		**CT2431**	**PE 4:Software Project Management**	**Understand** the core concepts of Software Project Management, including project definition, contract management, and planning	3	2							2	2		2	
				Apply activity planning, risk management, and monitoring techniques to optimize project scheduling and execution.	3	3	2		2				2	2		3	
				Analyze project evaluation techniques such as cost-benefit analysis, cash flow forecasting, and risk evaluation for effective decision-making.	2	3	3	3	3				3	3		3	
				Develop strategies for managing people, organizing teams, and handling contracts to enhance project performance and team productivity	2	2	3	2	3	3	3	3	3	3		2	
				Avg	2.5	2.5	2.7	2.5	2.7	3	3	3	2.5	2.5		2.5	
65		**CT2433**	**PE 4:: LAB:Software Project Management**	Describe key concepts of Software Project Management, including project planning, scheduling, and risk management.	3	2			3				2	3	2	2	
				Examine project requirements and decompose them into smaller tasks using a Work Breakdown Structure (WBS).	3	3	2	2	2			2		2	3	3	
				Demonstrate project scheduling, risk assessment, and cost-benefit analysis by implementing them in project case studies.	3	3	3	3	3	2		3	3	3	3	3	
				Avg	2.9	2.6			2.7	2.5		2.7	2.5	2.6	2.7	2.625	
66		**CT2435**	**PE V:Cloud Computing**	**Articulate** the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for	3									3	3		
				Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid	3	3								3	3		
				Provide the appropriate cloud computing solutions and recommendations according to the applications used.	3								3	3	3	3	
				Analyze various cloud programming models and apply them to solve problems on the cloud.	3	2	3	2							3	3	
				Avg	3	2.5	3	2					3	3	3	3	
67		**CT2437**	**PE V: Data Mining**	**Understand** the concepts related to data preparation, data modeling, and knowledge extraction	3	2	3								3	3	3
				Apply the techniques for data pre-processing and modeling for knowledge extraction	3	3	3	3				2	2		3	3	3
				Apply the supervised and unsupervised data mining techniques for knowledge extraction	3	3	3	3				2	2		3	3	3

				Analyze the data to apply appropriate data modeling and mining technique.	3	3	3	3							3	3	3
				Avg	3	2.8	3	3				2	2		3	3	3
68		CT2438	PE V:Embedded Systems	Understand and analyze the fundamental concepts of embedded systems, including their architecture, design requirements, and	3	3	2	2							2	2	3
				Develop hardware-software co-design strategies for distributed embedded systems, focusing on interfacing, debugging	2	2	3	2							2	2	3
				Explore real-time operating system (RTOS) concepts, task scheduling, and inter-task communication for multitasking and	2	3	2	3							2	2	3
				Apply ARM architecture and instruction set knowledge to design and implement embedded applications using timers, serial	3	2	3	3							3	2	3
				Avg	**2.5**	**2.5**	**2.5**	**2.5**							**2.3**	**2**	**3**
69		CT2409	Mini Project	Identify real life technical problem, conduct literature survey, and find limitations in existing solutions to address societal and	3	3	3	3	3	3	3	3	3	3	3		2
				Analyze the problem and identify suitable tools and technologies for finding solution to the problem.	3	3	3	3	3	3	2	3	3	3	3	3	3
				Communicate proposed solution effectively with proper presentation methods.	3	3			3			3	3	3	3		3
				Avg	3	3	3	3	3	3	2.5	3	3	3	3	3	2.6667
70		CT2410	CRT	Infer the Knowledge about current trends in industry	2					2					3		
				Deliver Technical presentation										3	3		
				Communicate effectively										3	3		
				Avg	2					2				3	3		
Semester VIII (SoE 2020)																		
71		CT2451	Major Project	Acquire the domain knowledge and analyze the implemented model	3	3	3	3	3	3	3	3		3	3		3
				Design and develop the solution using appropriate tools and techniques for betterment of society and industry	3		3	3	3	3	3	3		3	3	3	3
				Communicate the work done through paper presentation or participation in competition as a team.								3	3	3	3		
				Avg	3	3	3	3	3	3	3	3	3	3	3	3	3
72		CT2452	Extra curricular Activity Evaluation	An ability to work initially as well as part of team to achieve set goals.								3				3	
				Develop his hobbies and interests											3		3
				Communicate and work in team									3				
				Develop the sense of responsibility						3							
				Avg						3		3	3		3	3	3