SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)

Academic Year : 2023-2024 Institute/ Branch Name : Symbiosis Institute of Technology Programme Name : Bachelor of Technology (AIML Engineering)

Global	National / Local	Regional / National	
Sr.	**GA No.**	**Graduate Attributes**	**PO No.**	**Programme Outcomes**	**Relevance**
1	GA1	Scholarship: research, inquiry and lifelong learning	PO1	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	Global
2	GA1	Scholarship: research, inquiry and lifelong learning	PO2	Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.	Global
3	GA4	Employability: equipped with skills, attributes, leadership and entrepreneurial qualities that society needs; being capable of making a contribution to society through earning a living	PO3	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	National/Local
4	GA1	Scholarship: research, inquiry and lifelong learning	PO4	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems	Regional/National
5	GA4	Employability: equipped with skills, attributes, leadership and entrepreneurial qualities that society needs; being capable of making a contribution to society through earning a living	PO5	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.	Regional/National
6	GA2	Global citizenship: ethical, social and professional understanding	PO6	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	National/Local
7	GA3	Eco-literate: sensitivity towards a sustainable environment	PO7	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	Global
8	GA2	Global citizenship: ethical, social and professional understanding	PO8	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	Global
9	GA4	Employability: equipped with skills, attributes, leadership and entrepreneurial qualities that society needs; being capable of making a contribution to society through earning a living	PO09	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	Global
10	GA2	Global citizenship: ethical, social and professional understanding	PO10	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	National/Local
11	GA1	Scholarship: research, inquiry and lifelong learning	PO11	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	Regional/National
12	GA1	Scholarship: research, inquiry and lifelong learning	PO12	Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.	Global
13	GA4	Employability: equipped with skills, attributes, leadership and entrepreneurial qualities that society needs; being capable of making a contribution to society through	PSO1	To apply the concepts of Artificial Intelligence and Machine Learning with practical knowledge in analysis, design and development of intelligent systems and applications to multi-disciplinary problems	Regional/National
14	GA3	Eco-literate: sensitivity towards a sustainable environment	PSO2	To provide a concrete foundation to the students in the cutting edge areas Artificial Intelligence and Machine Learning and excelling in the specialized areas like Natural Language Processing, Computer Vision, Reinforcement Learning, Internet of Things, Cloud computing, Data Security and privacy etc.	National/Local

Sr. No.	Semester	Institute Course Code	Catalog Course Code	Title	Course Outcome No	Course Outcome Statement	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12	PSO1	PSO2
1	1	070126	TE7697	Linear Algebra	CO1	Apply row / column operations to find rank and inverse of a matrix.	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Solve system of simultaneous linear equations.	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Demonstrate the concepts of vector spaces and subspaces with basis and dimension.	Strong - H	Strong - H	Weak - L	-	-	-	-	-	-	-	-	-	-	-
					CO4	Express quadratic forms into canonical form and find the related linear transform.	Strong - H	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-
					CO5	Compute the eigenvalues and eigenvectors of a matrix to diagonalize the matrix and apply Cayley-Hamilton theorem to find inverse and higher powers of a matrix.	Strong - H	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-
					CO6	Examine the given function for linear transformations and find its null space and range.	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
2	1	070126	TE7545	Chemistry	CO1	Explain different terms and techniques, and solve numerical related to water treatment	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Describe the basic concept, mechanism in polymer chemistry and composites and solve numericals related to polymers	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Describe the concepts related to Energy science and Nanomaterials and solve numericals.	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Explain and use the concepts related to various spectroscopic analysis techniques.	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
3	1	070126	TE7695	Chemistry Lab	CO1	Apply the theoretical knowledge related to water analysis to practical use.	Moderate - M	Weak - L	-	-	-	Moderate - M	-	-	Strong - H	-	-	-	-	-
					CO2	Prepare a polymer and determine the molcular weight of polymers.	Moderate - M	Weak - L	-	-	-	Moderate - M	-	-	Strong - H	-	-	-	-	-
					CO3	Identify the percentage of moisture and ash in fuels samples.	Moderate - M	Weak - L	-	-	-	Moderate - M	-	-	Strong - H	-	-	-	-	-
					CO4	Utilize laws of spectroscopy for spectroscopic analysis.	Moderate - M	Weak - L	-	-	-	Moderate - M	-	-	Strong - H	-	-	-	-	-
4	1	070126	T7540	Basic Electrical and Electronics Engineering	CO1	Apply the laws and principles to analyze and solve specific electric circuits	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Acquire knowledge about basic principles, working, applications of DC machines and single-phase transformers.	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Apply the knowledge of diodes, Zener diodes, and BJTs to practical applications	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Comprehend the operation of binary digital systems and implement the logic gates using boolean algebra	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
5	1	070126	T7593	Basic Electrical and Electronics Engineering Lab	CO1	Understand the need of various safety precautions to be Undertaken while working with electrical equipment and learn different components and wiring schemes.	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Apply the knowledge of relevant laws and principles and familiarize with different theorems and analytical approaches for solving a given electric circuit.	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Illustrate the characteristics of basic semiconductor devices like, pn junction diode, Zener Diode and BJTs, their different configurations, and applications.	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Understand different controls of equipment like CRO and DMM.	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-	-
6	1	070126	TE7556	Introduction to Python Programming	CO1	Understanding the Programming language and parts of python components	Moderate - M	Moderate - M	Moderate - M	Weak - L	Strong - H	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO2	Implement the programs based on control Execution and explore functions in python programming language functions	Strong - H	Strong - H	Weak - L	Moderate - M	Weak - L	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO3	Create and manipulate items in lists and to perform string operations	Strong - H	Strong - H	Moderate - M	Weak - L	Weak - L	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO4	Use methods associated with dictionaries and manipulate items in tuples.	Strong - H	Strong - H	Moderate - M	Weak - L	Weak - L	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO5	Demonstrate the use of built-in functions to navigate the file system and Create regular expressions that match text patterns	Strong - H	Moderate - M	Moderate - M	Weak - L	Moderate - M	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO6	Demonstrate the implementation of instance variables, methods, and constructors with object oriented concepts	Strong - H	Strong - H	Weak - L	Weak - L	Moderate - M	-	-	-	-	-	-	-	Weak - L	Moderate - M
7	1	070126	TE7555	Introduction to Python Programming Lab	CO1	Understanding the Programming language and parts of python components	Moderate - M	Moderate - M	Moderate - M	Weak - L	Strong - H	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO2	Implement the programs based on control Execution and explore functions in python programming language functions	Strong - H	Strong - H	Weak - L	Moderate - M	Weak - L	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO3	Create and manipulate items in lists and to perform string operations	Strong - H	Strong - H	Moderate - M	Weak - L	Weak - L	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO4	Use methods associated with dictionaries and manipulate items in tuples.	Strong - H	Strong - H	Moderate - M	Weak - L	Weak - L	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO5	Demonstrate the use of built-in functions to navigate the file system and Create regular expressions that match text patterns	Strong - H	Moderate - M	Moderate - M	Weak - L	Moderate - M	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO6	Demonstrate the implementation of instance variables, methods, and constructors with object oriented concepts	Strong - H	Strong - H	Weak - L	Weak - L	Moderate - M	-	-	-	-	-	-	-	Weak - L	Moderate - M
8	1	070126	T6732	Critical Thinking	CO1	Acquire better decisions based on logical thinking.	-	Moderate - M	Weak - L	Moderate - M	-	-	-	-	Weak - L	-	-	Moderate - M	-	-
					CO2	Identify and evaluate facts in an argument.	-	Moderate - M	Weak - L	Moderate - M	-	-	-	-	Weak - L	-	-	Moderate - M	-	-
					CO3	Draw truth, ambiguity, vagueness and fillacy in argument.	-	Moderate - M	Weak - L	Weak - L	-	-	-	-	-	-	-	Moderate - M	-	-
					CO4	Construct questions to reach conclusions	-	Weak - L	Weak - L	Weak - L	-	-	-	-	-	-	-	Weak - L	-	-
9	1	070126	T7674	Cyber Security	CO1	Understand threats models and different cyber security terms used at National and International level.	Strong - H	Weak - L	Weak - L	Weak - L	Moderate - M	-	-	Weak - L	-	Moderate - M	Weak - L	Moderate - M	-	-
					CO2	Infer National and International cyber laws and various sections, amendments under them.	Strong - H	Moderate - M	Weak - L	Weak - L	Moderate - M	-	-	Weak - L	-	Moderate - M	Weak - L	Moderate - M	-	-
					CO3	Infer and compare the implemented management practices by various organizations in the cyber security domain.	Strong - H	Moderate - M	Weak - L	Weak - L	-	-	-	Weak - L	-	Moderate - M	Weak - L	Strong - H	-	-

					CO4	Identify existing problems in the cyber world and propose solution for the problem	Strong - H	Moderate - M	Weak - L	Weak - L	Moderate - M	-	-	Weak - L	-	Moderate - M	Weak - L	Moderate - M	-	-
10	1	070126	T2646	Entrepreneurship Venture	CO1	Describe Innovation Stories of various Entrepreneurs.		Moderate - M	Moderate - M	Weak - L	-	-	-	-	-	Strong - H	-	-	-	-
					CO2	Understand the various traits necessary to become an entrepreneur		Weak - L	Weak - L	Weak - L	-	-	-	-	-	Strong - H	-	-	-	-
					CO3	Analyse an opportunity of Innovation and design solution		Moderate - M	Weak - L	Weak - L	-	-	-	-	-	Strong - H	-	-	-	-
					CO4	Develop a business plan of the novel idea designed		Strong - H	Weak - L	Weak - L	-	-	-	-	-	Strong - H	-	-	-	-
					CO1	Relate fundamental concepts/laws of science and engineering	Moderate - M	Strong - H	Weak - L	-	-	-	-	-	Moderate - M	Moderate - M	-	Moderate - M	-	-
11	1	070126	TE7300	Tinker Lab	CO2	Practise pre-achieved skills on hardware and devices	Strong - H	Strong - H	Moderate - M	-	-	-	-	-	Moderate - M	Moderate - M	-	Moderate - M	-	-
					CO3	Take apart and reassemble and/or repairing of engineering gadgets	Strong - H	Strong - H		-	-	-	-	-	-	-	-	-	-	-
					CO4	Explore various aspects of tinkered devices/instruments	Moderate - M	Moderate - M	Moderate - M	-	-	-	-	-	Moderate - M	Moderate - M	-	Moderate - M	-	-
					CO5	Design and make models out of creativity using raw material	Moderate - M	Moderate - M	Moderate - M	-	-	-	-	-	Moderate - M	Moderate - M	-	Moderate - M	-	-
					CO1	Apply the concepts of partial differentiation to solve problems on homogeneous	Strong - H	Strong - H	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
12	2	070126	TE7543	Calculus	CO2	Evaluate integrals using reduction formulae using DUIS rule and beta-gamma functions.	Strong - H	Strong - H	Weak - L	-	-	-	-	-	-	-	-	-	-	-
					CO3	Determine length, surface area and volume of revolution using integration	Strong - H	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
					CO4	Identify the type of differential equations and solve using suitable method	Strong - H	Weak - L	Weak - L	-	-	-	-	-	-	-	-	-	-	-
					CO1	To distinguish between different types of oscillators and damping and explain the concept of resonance.	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	To explain the concept of mechanical and acoustic waves, formation of harmonics and predict the frequencies thereof.	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
13	2	070126	TE7540	Physics	CO3	To interpret energy bands in solids, compare their electronic properties and predict probability of occupancy of energy levels.	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	To describe superconducting phenomenon through calculations or explaining fundamental theory.	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
					CO5	To explain fundamentals of quantum theory.	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
					CO6	To explain various applications of quantum mechanics in real life.	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
					CO1	Acquire ability to conduct, analyze and interpret experiments in Physics.	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Demonstrate the required experimental skills of the given experiment.	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
14	2	070126	TE7687	Physics Lab	CO3	Analyze the given/ obtained data and interpret the result.	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Communicate ideas/knowledge via verbal/written means and demonstrate the understanding of concepts.	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO1	Apply Mathematical and Logical operations with conditional and iterative statements to write C programs	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Ability to work with numbers, textual information, characters and strings.	Moderate - M	Weak - L	Weak - L	-	-	-	-	-	-	-	-	-	-	-
15	2	070126	TE7288	Programming in C	CO3	students will have the ability to effectively implement and utilize functions and unions, enabling them to develop modular and flexible programs with enhanced code organization and efficient data manipulation.	Moderate - M	Moderate - M	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-
					CO4	students will possess the skills to effectively define, manipulate, and utilize structures and unions, enabling them to create complex data structures and efficiently manage data within their programs.	Moderate - M	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
					CO5	students will be able to effectively utilize dynamic memory allocation techniques in C programming, enabling efficient memory usage and enhancing program functionality.	Moderate - M	Moderate - M	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-
					CO1	Understand the programming in IDE (Integrated Development Environment) and write, execute and	Moderate - M	Weak - L			-	-	-	-	-	-	-	-	-	-
					CO2	Interpret the programming tasks logically and understand making the pseudo-code and flowchart.	Moderate - M	Weak - L	Weak - L		-	-	-	-	-	-	-	-	-	-
16	2	070126	TE7289	Programming in C Lab	CO3	Design and implement basic programming solutions including statements, macros, control structures and methods.	Moderate - M	Moderate - M	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-
					CO4	Understand and apply the concept of Array and Strings to solve problem statement.	Moderate - M	Moderate - M	Moderate - M		-	-	-	-	-	-	-	-	-	-
					CO5	Understand the concepts of Function modules, its usage and memory allocation using Pointers	Moderate - M	Moderate - M	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-
					CO1	Identify the barriers to effective communication in accordance with all types of communication; avoid or overcome them.	-	-	-	-	-	-	-	-	Strong - H	Weak - L	-	-	-	-
17	2	070126	T7383	Communication Skills	CO2	Construct sentences effectively using grammar and vocabulary.	-	-	-	-	-	-	-	-	Strong - H	Moderate - M	-	-	-	-
					CO3	Demonstrate the 7 "c" of effective communication in varied situations.	-	-	-	-	-	-	-	-	Strong - H	Moderate - M	-	-	-	-
					CO4	Apply etiquettes in oral and written communication.	-	-	-	-	-	-	-	-	Strong - H	Weak - L	-	-	-	-
					CO5	Demonstrate writing skills and use in business and technical correspondence.	-	-	-	-	-	-	-	-	Strong - H	Moderate - M	-	-	-	-
					CO1	Enhance ideas and concepts in the communication process well through vocabulary building, LSRW aptitude tests, mind mapping	-	-	-	-	-	-	-	Weak - L	Strong - H	Moderate - M	-	-	-	-
18	2	070126	T7384	Communication skills lab	CO2	Demonstrate linguistic competence- through accuracy in grammar, pronunciation and vocabulary.	-	-	-	-	-	-	-	-	Strong - H	Moderate - M	-	-	-	-
					CO3	Sketch creative side in formal as well as informal communication	-	-	-	-	-	-	-	-	Strong - H	Moderate - M	-	-	-	-
					CO4	Employ etiquettes in oral and written communication.	-	-	-	-	-	-	-	-	Strong - H	Weak - L	-	-	-	-
					CO5	Modify listening skills.	-	-	-	-	-	-	-	-	Strong - H	Weak - L	-	-	-	-
					CO6	Demonstarte articlation skills effectively while participating in Group discussions, debate or job interviews etc.	-	-	-	-	-	-	-	Weak - L	Strong - H	Weak - L	-	-	-	-
					CO1	Understand the importance of right brain directed thinking complementing left brain directed thinking	Weak - L	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Employ processes and methods of creative problem solving in real life problems	-	Moderate - M	-	-	-	Moderate - M	-	-	-	-	-	-	-	-
19	2	070126	T6873	Creative Thinking	CO3	Demonstrate creative and innovative thinking skills by the intersection of ideas from one field into another new field.	-	Moderate - M	-	-	-	-	-	-	-	Moderate - M			-	-
					CO4	Explore various disruptive innovations and techniques in the field of Engineering	-	-	-	-	-	-	-	-	-	-	-	Strong - S	-	-
					CO5	Discover the solutions to engineering problems provided by nature and mimic to apply in seeking creative solutions.	-	-	-	-	-	-	Moderate - M	-	-	-	-	-	-	-
					CO1	Interpret set of data using appropriate measures of tendency and dispersions related	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
20	2	070126	TE7690	Statistics for Data Science	CO2	Find coefficient of correlation and estimate the value of dependent variable using regression analysis.	Moderate - M	Weak - L	Weak - L	-	-	-	-	-	-	-	-	-	-	-
					CO3	Understand to figure out the linear regression equation for estimating values from the given set of correlation data for values.	Moderate - M	Moderate - M	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-
					CO4	Develop an understanding of sampling and estimation along with some convergence techniques.	Moderate - M	Weak - L	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-
					CO1	Identify key concepts of data analysis using statistical analysis software	Strong - H	Moderate - M	Weak - L		Moderate - M	-	-	-	-	-	-	-	-	-
21	2	070126	TE7748	Software Tools for Artificial Intelligence and Machine Learning	CO2	Explore and apply different statistical techniques using statistical analysis software.	Strong - H	Moderate - M	Weak - L		Moderate - M	-	-	-	-	-	-	-	-	-
					CO3	Explore and apply different techniques with R packages.	Strong - H	Moderate - M	Weak - L		Moderate - M	-	-	-	-	-	-	-	-	-
					CO4	Explore and apply different techniques with Python statistics packages.	Strong - H	Moderate - M	Weak - L		Moderate - M	-	-	-	-	-	-	-	-	-
					CO1	Apply the basic rules and theorems of probability theory such as Bayes's Theorem.	Moderate - M	Moderate - M	Strong - H			-	-	-	-	-	-	-	Moderate - M	Weak - L
22	3	070126	TE7699	Probability and Random Processes	CO2	Understand the concepts of probabilities and random variable (discrete and continuous).	Strong - H	Strong - H	Moderate - M			-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO3	Utilize probability distributions to solve engineering problems.	Strong - H	Strong - H	Moderate - M			-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO4	Interpret discrete and continuous time Markov chain.	Moderate - M	Moderate - M	Moderate - M			-	-	-	-	-	-	-	Moderate - M	Weak - L
					CO1	Familiarization with Python libraries -NumPy/Pandas/Scipy- for Linear algebra, working with different file types (.txt/.csv/.xlsx/.xml and images	Moderate - M	Weak - L	Moderate - M	Weak - L	Moderate - M	-	-	-	Weak - L	Weak - L	-	-	Weak - L	Moderate - M
23	3	070126	TE7759	Python for Data Science	CO2	Fundamentals of time-series- ACF/PACF, AR, MA, and ARMA model- Application to wind speed & rainfall/surface run-off modeling	Moderate - M	Weak - L	Moderate - M	Weak - L	Moderate - M	-	-	-	Weak - L	Weak - L	-	-	Weak - L	Moderate - M
					CO3	Fundamentals of Regression and Classification using Gaussian Process, KNN	Moderate - M	Weak - L	Moderate - M	Weak - L	Moderate - M	-	-	-	Weak - L	Weak - L	-	-	Weak - L	Moderate - M
					CO4	Deployment of machine learning models on Streamlit cloud with Github	Moderate - M	Weak - L	Moderate - M	Weak - L	Moderate - M	-	-	-	Weak - L	Weak - L	-	-	Weak - L	Moderate - M
					CO1	Acquire a deep understanding of sorting and searching algorithms, their implementation, analysis, and evaluation. Develop problem-solving skills and informed algorithm selection for real-world applications.	Strong - H	Weak - L	-	-	-	-	-	-	-	-	-	Weak - L	Strong - H	Strong - H
					CO2	understand and implement linear, circular, and doubly linked lists. They will write pseudocode for list functions, perform node operations, and apply linked lists in implementing stack and queue data structures.	Strong - H	Weak - L	-	-	-	-	-	-	-	-	-	Weak - L	Strong - H	Strong - H
24	3	070126	TE7544	Data Structures and Algorithms	CO3	Gain understanding of linear and non-linear data structures, focus on trees and binary trees, grasp tree terminologies and concepts, implement tree traversals, convert general trees to binary trees, study binary search trees, explore threaded binary trees, and perform preorder and inorder traversals in threaded binary search trees.	Strong - H	Weak - L	Weak - L	-	-	-	-	-	Moderate - M	Moderate - M	-	Weak - L	Strong - H	Strong - H
					CO4	Acquire knowledge on graphs as an Abstract Data Type (ADT), learn graph representation using adjacency matrix and adjacency list, understand Depth First Search and Breadth First Search algorithms, study minimal spanning tree algorithms (Prim's and Kruskal's), explore Dijkstra's algorithm for shortest path, and apply these algorithms to real-world scenarios.	Strong - H	Moderate - M	Weak - L	-	-	-	-	-	Weak - L	Moderate - M	-	Weak - L	Strong - H	Strong - H

					CO5	Gain understanding of symbol tables and their significance, delve into AVL (Adelson-Velskii and Landis) Trees, explore the heap data structure, and learn its application in heap sort algorithm.	Strong - H	Weak - L	Weak - L	-	-	-	-	-		Weak - L	-	Weak - L	Strong - H	Strong - H
25	3	070126	TE7546	Data Structures and Algorithms Lab	CO1	Gain understanding and practical implementation of searching (linear, binary) and sorting (bubble, selection, insertion, merge, quick) techniques. Analyze complexity, evaluate efficiency, and recognize importance of data structures and algorithms.	Moderate - M	Moderate - M	Moderate - M	Moderate - M	Weak - L	-	-	-	Weak - L	Weak - L	-	Moderate - M	-	-
					CO2	Gain understanding and practical implementation of singly linked lists, doubly linked lists, and circularly linked lists. Implement menu-driven programs for create, insert, delete, reverse, and concatenate operations. Analyze efficiency and apply knowledge to solve real-world problems.	Moderate - M	Moderate - M	Moderate - M	-	Weak - L	-	-	-	Weak - L	Weak - L	-	Moderate - M	-	-
					CO3	students will gain the ability to design and implement menu-driven programs to create a binary search tree, conduct inorder, preorder, and postorder traversals, and perform efficient node searches within the tree structure.	Moderate - M	Moderate - M	Moderate - M	-	Weak - L	-	-	-	Moderate - M	Moderate - M	-	Moderate - M	-	-
					CO4	Gain practical implementation skills in graph algorithms, including insertion and deletion using adjacency list, Dijkstra shortest path algorithm, BFS, and DFS. Apply knowledge to solve real-world problems and analyze algorithm efficiency.	Moderate - M	Moderate - M	Moderate - M	-	Weak - L	-	-	-	Moderate - M	Moderate - M	-	Moderate - M	-	-
26	3	070126	TE7547	Data Preprocessing Lab	CO1	Explore data acquisition approaches to extract data from different sources.	Moderate - M	Moderate - M	-	-	Moderate - M	-	-	-	Moderate - M	-	Moderate - M	Moderate - M	Weak - L	Weak - L
					CO2	Apply various data preprocessing techniques on acquired data	Moderate - M	Moderate - M	-	-	Moderate - M	-	-	-	Moderate - M	-	Moderate - M	Moderate - M	Weak - L	Weak - L
					CO3	Perform data analysis and modeling on processed data	Moderate - M	Moderate - M	-	-	Moderate - M	-	-	-	Moderate - M	-	Moderate - M	Moderate - M	Weak - L	Weak - L
					CO4	Develop the ability to perform thorough analyses of results for the purpose of crafting high-quality technical blogs or research papers.	Moderate - M	Moderate - M	-	-	Moderate - M	-	-	-	Moderate - M	-	Moderate - M	Moderate - M	Weak - L	Weak - L
27	3	070126	TE7755	Exploratory Data Analysis Lab	CO1	Analyze the essentials and challenges of exploratory data visualization	Weak - L	Moderate - M	Weak - L	-	Weak - L	-	-	-		Moderate - M	-	Weak - L	Weak - L	Moderate - M
					CO2	Differentiate between the univariate, bi-variate and multivariate analysis of data	Moderate - M	Moderate - M	Weak - L	Weak - L	Moderate - M	-	-	-	Moderate - M	Weak - L	-	Moderate - M	Weak - L	Moderate - M
					CO3	Explore the different the essential exploratory techniques for analyzing and visualizing structured and unstructured data and categorical data	Moderate - M	Strong - H	Strong - H	Moderate - M	Moderate - M	-	-	-	Weak - L	Moderate - M	-	Weak - L	Moderate - M	Moderate - M
					CO4	Apply the concepts of data visualization in case study based problem solving	Weak - L	Moderate - M	Strong - H	Weak - L	Strong - H	-	-	-	Moderate - M	Weak - L	-	Weak - L	Weak - L	Moderate - M
28	3	070126	TE7752	Database Concepts for Data Science Lab	CO1	Understand the basic elements of a relational database management system and design entity relationship diagram and convert it into RDBMS.	Strong - H	Weak - L	Weak - L	-	Moderate - M	-	-	-	-	-	-	-	Weak - L	Weak - L
					CO2	Understand of SQL basics and demonstrate data definition, data manipulation and data control languages.	Strong - H	Weak - L	Weak - L	-	Moderate - M	-	-	-	-	-	-	-	Weak - L	Weak - L
					CO3	Demonstrate and develop various advanced SQL queries	Strong - H	Weak - L	Weak - L	-	Moderate - M	-	-	-	-	-	-	-	Weak - L	Weak - L
					CO4	Understanding of NoSQL databases, with a focus on MongoDB basic operations.	Strong - H	Weak - L	Weak - L	-	Moderate - M	-	-	-	-	-	-	-	Weak - L	Weak - L
29	3	070126	T6749	Design Thinking	CO1	To Understand and Apply Design Thinking Approach, best practices & nuances, Global Scenario for Innovation & Entrepreneurship	Strong - H	Moderate - M	Strong - H	-	-	-	-	-	Strong - H	Strong - H	Moderate - M	Strong - H	-	-
					CO2	To Learn & Develop Mindset, Attitude and 21st Century Skills as a problem solver and innovator needed by professionals nowadays	Strong - H	Moderate - M	Strong - H	-	-	-	-	-	Strong - H	Strong - H	Moderate - M	Strong - H	-	Strong - H
					CO3	To Observe and Investigate the real and hidden needs of the user for complex problem scenario and Analyze & Synthesize the research data to define correct and final problem statement	Strong - H	Moderate - M	Strong - H	-	-	-	-	-	Strong - H	Strong - H	Moderate - M	Strong - H	Moderate - M	-
					CO4	To Evaluate the ideas and Create Prototyping and Iterative Mindset for successful product development	Strong - H	Moderate - M	Strong - H	-	-	-	-	-	Strong - H	Strong - H	Moderate - M	Strong - H	Moderate - M	Strong - H
30	3	070126	F7061	Fundamentals of Image Processing(Flexi)	CO1	Understand the fundamentals of digital image processing	Strong - H	Strong - H	-	-	-	-	-	-	-	-	-	-	Weak - L	Weak - L
					CO2	Explain different image enhancement, filtering, and restoration methods	Strong - H	Strong - H	-	-	-	-	-	-	-	-	-	-	Weak - L	Weak - L
					CO3	Apply morphological image processing	Strong - H	Strong - H	-	-	-	-	-	-	-	-	-	-	Weak - L	Weak - L
					CO4	Perform image segmentation	Strong - H	Strong - H	-	-	-	-	-	-	-	-	-	-	Weak - L	Weak - L
					CO5	Extract features and classify the patterns	Strong - H	Strong - H	-	-	-	-	-	-	-	-	-	-	Weak - L	Weak - L
31	3	070126	F7062	Fundamentals of Image Processing Lab(Flexi)	CO1	Become familiar with digital image fundamentals	Strong - H	Strong - H	-	-	-	-	-	-	-	-	-	-	Weak - L	Weak - L
					CO2	Get exposed to simple image enhancement techniques in the Spatial and Frequency domain	Strong - H	Strong - H	-	-	-	-	-	-	-	-	-	-	Weak - L	Weak - L
					CO3	Demonstrate an understanding of image morphology	Strong - H	Strong - H	-	-	-	-	-	-	-	-	-	-	Weak - L	Weak - L
					CO4	Understand concepts in image segmentation	Strong - H	Strong - H	-	-	-	-	-	-	-	-	-	-	Weak - L	Weak - L
					CO5	Explain feature extraction and pattern classification methods	Strong - H	Strong - H	-	-	-	-	-	-	-	-	-	-	Weak - L	Weak - L
32	3	070126	T6872	Foundation of Ethics	CO1	To understand the tenets of ethics as a part of daily life	-	Moderate - M	Strong - H	-	-	-	-	-	-	-	-	-	-	-
					CO2	To gain knowledge on ethical theories	Strong - H	Strong - H	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
					CO3	To reason clearly and precisely about ethical and moral issues in professional life	Strong - H	Strong - H	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	To resolve moral conflicts in professional life	Moderate - M	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
33	4	070126	T6774	Principles of Economics	CO1	The objective of the course is to explain the students to the most important and basic principles of economics	-	-	-	-	-	Moderate-M	-	-	-	-	Moderate-M	-	-	-
					CO2	The course will enable students to look at the behavior of individuals and institutions involved in the consumption, production and exchange of goods and services.	-	-	-	-	-	Weak-L	-	-	-	-	Moderate-M	-	-	-
					CO3	The course is designed to improve critical thinking, problem solving skills by using economic models and theories. Thus, the course aims to provide a comprehensive coverage of fundamental principles of economics that would enable students to be more effective decision makers in the sphere of economic activities.	-	-	-	-	-	Weak-L	-	-	-	-	Moderate-M	Moderate-M	-	-
					CO4	Students entering any profession in the workforce today must be able to utilize these basic economic principles. Students with solid understanding of the basic theories can start thinking like an economist; understand the current topics in economics. This will enable them to formulate their own opinions on various economic issues.	-	-	-	-	-	Weak-L	-	-	-	-	Moderate-M	Moderate-M	-	-
34	4	070126	F7055	Programming with Java	CO1	Design and code programs in the Java Programming language that make strong use of the object oriented programming paradigm.	Strong - H	Strong - H	Moderate - M	-	Moderate - M	Weak - L	-	-	Moderate - M	Moderate - M	Moderate - M	Moderate - M	Weak - L	-
					CO2	Develop reusable programs using the concepts of inheritance, polymorphism, interfaces, and packages.	Strong - H	Strong - H	Moderate - M	-	Moderate - M	Weak - L	-	-	Moderate - M	Moderate - M	Moderate - M	Moderate - M	Weak - L	-
					CO3	Develop Java programs to implement error-handling techniques using exception handling.	Strong - H	Strong - H	Moderate - M	-	Moderate - M	Weak - L	-	-	Moderate - M	Moderate - M	Moderate - M	Moderate - M	Weak - L	-
					CO4	Develop Java programs using the concept of JDBC.	Strong - H	Strong - H	Moderate - M	-	Moderate - M	Weak - L	-	-	Moderate - M	Moderate - M	Moderate - M	Moderate - M	Weak - L	-
					CO5	Develop multithreading concepts in Java.	Strong - H	Strong - H	Moderate - M	-	Moderate - M	Weak - L	-	-	-	-	-	Moderate - M	Weak - L	-
35	4	070126	F7056	Programming with Java Lab	CO1	Implement object-oriented concepts using Java.	Strong - H	Strong - H	Strong - H	-		-	-	-	Strong - H	Strong - H	-	Strong - H	Weak - L	-
					CO2	Develop reusable programs using the concepts of inheritance, polymorphism, interfaces, and	Strong - H	Strong - H	Strong - H	-	Strong - H	-	-	-	Strong - H	Strong - H	-	Strong - H	Weak - L	-
					CO3	Implement Java programs to implement exception handling concepts.	Strong - H	Strong - H	Strong - H	-	Strong - H	-	-	-	Strong - H	Strong - H	-	Strong - H	Weak - L	-
					CO4	Develop Java programs that access and manipulate data from databases.	Strong - H	Strong - H	Strong - H	-	Strong - H	-	-	-	Strong - H	Strong - H	-	Strong - H	Weak - L	-
					CO5	Develop multithreading concepts in Java	Strong - H	Strong - H	Strong - H	-	Strong - H	-	-	-	Strong - H	Strong - H	-	Strong - H	Weak - L	-
36	4	070126	TE7499	Supervised Machine Learning	CO1	Understand the basic concepts of Supervised learning and difference between the types of machine learning	-	Moderate - M	Strong-H	-	-	-	-	-	-	-	-	-	-	-
					CO2	Perform and analyse the different regression techniques for prediction	Strong - H	Strong - H	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
					CO3	Perform and analyze the different methods of classification	Strong - H	Strong - H	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Identify the problem and apply the suitable algorithm based on regression and classification problem	Moderate - M	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
37	4	070126	TE7500	Supervised Machine Learning Lab	CO1	Apply the basic concepts of Supervised learning and difference between the types of machine	Moderate - M			-	-	-	-	-	-	-	-	-	-	-
					CO2	Identify the problem and apply the suitable algorithm based on regression and classification problem	-	Moderate - M	-	Weak - L	-	-	-	-	Weak - L	-	-	-	-	-
					CO3	Perform and analyse the different regression or classification techniques for prediction	-		-	Weak - L	-	-	-	-	-	-	-	-	Weak - L	Weak - L
					CO4	Acquire the skill to articulate reviews, formulate architectural designs, and conduct comprehensive result analyses.	-	-	-	Weak - L	-	-	-	-	-	Weak - L	-	-	-	-
38	4	070126	TE7760	Unsupervised Learning	CO1	Contrast the machine learning algorithm types and classify different data types used for unsupervised learning.	Moderate - M	Weak - L	Moderate - M	-	Weak - L	-	-	-	-	-	-	-	Strong - H	Strong - H
					CO2	Apply variants of dimensionality reduction techniques and model unsupervised learning methods suitable for different datasets.	Moderate - M	Weak - L	Moderate - M	-	Weak - L	-	-	-	-	-	-	-	Strong - H	Strong - H
					CO3	Model the static and hierarchical clustering techniques with comparative analysis.	Moderate - M	Weak - L	Moderate - M	-	Weak - L	-	-	-	-	-	-	-	Strong - H	Strong - H
					CO4	Explain incremental and advanced clustering algorithms for domain-specific datasets.	Moderate - M	Weak - L	Moderate - M	-	Weak - L	-	-	-	-	-	-	-	Strong - H	Strong - H
					CO5	Demonstrate deep unsupervised learning approaches like autoencoders.	Moderate - M	Weak - L	Moderate - M	-	Weak - L	-	-	-	-	-	-	-	Strong - H	Strong - H
39	4	070126	TE7761	Unsupervised Learning Lab	CO1	Apply variants of dimensionality reduction techniques and model unsupervised learning methods suitable for different datasets.	Moderate - M	Weak - L	Moderate - M	-	Weak - L	-	-	-	-	-	-	-	Strong - H	Strong - H
					CO2	Model the static and hierarchical clustering techniques with comparative analysis.	Moderate - M	Weak - L	Moderate - M	-	Weak - L	-	-	-	-	-	-	-	Strong - H	Strong - H
					CO3	Explain incremental and advanced clustering algorithms for domain-specific datasets.	Moderate - M	Weak - L	Moderate - M	-	Weak - L	-	-	-	-	-	-	-	Strong - H	Strong - H
					CO4	Demonstrate deep unsupervised learning approaches like autoencoders.	Moderate - M	Weak - L	Moderate - M	-	Weak - L	-	-	-	-	-	-	-	Strong - H	Strong - H
40	4	070126	TE7529	AI Ethics	CO1	Articulte the historical trajectory and philosophical implications of artificial intelligence in discourse	Moderate - M	Moderate - M	-	Moderate - M	-	-	-	Moderate - M	-	-	-	-	Weak - L	Moderate - M
					CO2	Identify ethical principles and legal knowledge to navigate challenges in AI development and implementation	-	Moderate - M	-	Moderate - M	-	Weak - L	Weak - L	Moderate - M	-	-	-	-	Weak - L	Moderate - M
					CO3	Explain future challeneges posed by AI, including unemplyment and wealth inequality	-	-	-	Moderate - M	-	Moderate - M	Moderate - M	Moderate - M	-	-	-	-	Weak - L	Moderate - M

					CO4	Discuss ethical guidelines for AI governance, addressing issues like bias, security and unintended consequences	Moderate - M	-	-	Moderate - M	-	-	Moderate - M	Moderate - M	-	-	-	-	Weak - L	Moderate - M
41	4	070126	TE7757	Optimization Techniques for Machine Learning	CO1	Will able to obtaining the most optimal solution for a problem with given constraints	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Use classical optimization techniques and numerical methods of optimization	Moderate - M	Moderate - M	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	Weak - L	-
					CO3	Will be able to apply K Means algorithm to find distinct groups or "clusters" within a data set, and can optimize parameter using PSo or GA optimization techniques.	Moderate - M	Moderate - M	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	Moderate - M	-
					CO4	Will be able to apply KNN and Neural Network algorithms for classification and compare the result with different optimizers, algorithms used as parameters to tune these algorithms.	Moderate - M	Moderate - M	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	Moderate - M	-
42	4	070126	TE7542	Discrete Mathematics	CO1	Use the concept of sets, Venn diagrams and principle of inclusion and exclusion.	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Use the basics of different type of relations, and algebraic structures.	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Apply the graph theory-based modeling to solve different problem.	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Solve the problems related to decision-making processes based on logic.	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
43	4	070126	T6184	Basic German I	CO1	Understand the language basics and its culure and to greet & introduce in German language	-	Moderate - M	Strong-H	-	-	-	-	-	-	-	-	-	-	-
					CO2	To form simple sentences and list the numbers as per the German language	Strong-H	Strong-H	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
					CO3	To write the answers in German language	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	To Communicate in German language	Moderate - M	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
44	4	070126	T6186	Basic French I	CO1	Greet & introduce in French language	-	-	-	-	-	-	-	-	-	Moderate - M	-	Moderate - M	-	-
					CO2	Form simple sentences and list the numbers as per the French language.	-	-	-	-	-	-	-	-	-	Moderate - M	-	Moderate - M	-	-
					CO3	Write the answers in French language.	-	-	-	-	-	-	-	-	-	Moderate - M	-	Moderate - M	-	-
					CO4	Communicate in French language.	-	-	-	-	-	-	-	-	-	Moderate - M	-	Moderate - M	-	-
45	4	070126	T6188	Basic Spanish I	CO1	Greet & introduce in Spanish language	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO2	Form simple sentences and list the numbers as per the Spanish language.	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO3	Write the answers in Spanish language.	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO4	Communicate in Spanish language.	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
46	5	070126	T8000	Service Learning	CO1	To promote learning through active participation	Moderate - M	Moderate - M	Moderate - M	-	Moderate - M	Strong-H	Moderate - M	-	Strong-H	Moderate - M	-	Moderate - M	-	-
					CO2	To provide structured time to students to think, discuss and implement from their past experiences	Moderate - M	Moderate - M	Moderate - M	-	Moderate - M	Strong-H	Moderate - M	-	-	-	-	-	-	Moderate - M
					CO3	To apply their skills and knowledge beyond the classroom in real life situations	Moderate - M	Moderate - M	Moderate - M	Moderate - M	Moderate - M	Strong-H	Moderate - M	Weak - L	Strong-H	-	Moderate - M	Moderate - M	-	Moderate - M
					CO4	To stimulate sense of caring in students	-	-	-	-	Moderate - M	-	Moderate - M	-	-	Moderate - M	-	Moderate - M	-	-
47	5	070126	F7053	Web and Mobile Application Development	CO1	Apply technologies of ReactJS to create interactive website.	Strong-H	Moderate-M	Weak-L	Moderate-M	Strong-H	-	-	-	Moderate-M	Moderate-M	-	-	Strong-H	Strong-H
					CO2	Develop and sketch an application using responsive web.	Strong-H	Strong-H	Strong-H	Moderate-M	Strong-H	-	-	-	Moderate-M	Moderate-M	-	-	Strong-H	Strong-H
					CO3	Develop UI based environments suitable for mobile and desktop application.	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	-	-	-	Moderate-M	Moderate-M	-	-	Strong-H	Strong-H
					CO4	Apply the backend database connectivity for developed application.	Strong-H	Strong-H	Moderate-M	Moderate-M	Strong-H	-	-	-	Moderate-M	Moderate-M	-	-	Strong-H	Strong-H
					CO5	Use the security aspects in developed applications.	Strong-H	Strong-H	Moderate-M	Moderate-M	Strong-H	-	-	-	Moderate-M	Moderate-M	-	-	Strong-H	Strong-H
48	5	070126	TE7753	Deep Learning	CO1	Discuss various Deep Learning concepts, principles, algorithms and concepts	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Describe all concepts related to NN which will be useful for DL applications	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Summarize various DL models and deep NN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Give examples of various optimization algorithms	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO5	Discuss and extend CNN and RNN concepts	-	-	-	-	-	-	-	-	-	-	-	-	-	-
49	5	070126	TE7754	Deep Learning Lab	CO1	Understand and learn the deep learning and related libraries.	Strong-H	-	Moderate-M	-	Strong-H	-	-	-	-	-	-	-	Strong-H	Strong-H
					CO2	Learn basics of Tensor Flow.	Strong-H	-	Moderate-M	-	Strong-H	-	-	-	-	-	-	-	Strong-H	Strong-H
					CO3	Learn, compare, implement and analyze various algorithms like ANN, CNN, RNN.	Strong-H	-	Strong-H	-	Strong-H	-	-	-	-	-	-	-	Strong-H	Strong-H
					CO4	Design and implement CNN, RNN using Tensor Flow for a case study.	Strong-H	-	Strong-H	-	Strong-H	-	-	-	-	-	-	-	Strong-H	Strong-H
50	5	070126	TE7908	Natural Language Processing and Applications	CO1	Understand the fundamental concepts and applications of NLP.	Moderate-M	Moderate-M	Weak - L	-	Weak - L	-	-	-		Weak - L	-	Weak - L	Moderate-M	Moderate-M
					CO2	Demonstrate the understanding of various word embedding techniques and its application in NLP	Moderate-M	Moderate-M	Moderate-M	Weak - L	Weak - L	-	-	-	Weak - L	Weak - L	-	Weak - L	Moderate-M	Moderate-M
					CO3	Describe the application of deep learning techniques such as RNN, LSTM for NLP tasks.	Moderate-M	Moderate-M	Strong-H	Moderate-M	Moderate-M	-	-	-	Weak - L	Weak - L	-	Weak - L	Moderate-M	Moderate-M
					CO4	Illustrate the working of Machine translation and text classification techniques.	Moderate-M	Moderate-M	Strong-H	Moderate-M	Moderate-M	-	-	-	Weak - L	Weak - L	-	Weak - L	Moderate-M	Moderate-M
51	5	070126	TE7909	Natural Language Processing and Applications Lab	CO1	Apply and demonstrate the basic concepts of NLP.	Moderate - M	Moderate - M	Weak - L	-	Weak - L	-	-	-	-	Weak - L	-	Weak - L	Moderate - M	Moderate - M
					CO2	Distinguish and illustrate various approaches to vectorization and embeddings for NLP tasks.	Moderate - M	Moderate - M	Moderate - M	Weak - L	Weak - L	-	-	-	Weak - L	Weak - L	-	Weak - L	Moderate - M	Moderate - M
					CO3	Understand and apply the various DL and ML methods for NLP problems.	Moderate - M	Moderate - M	Strong-H	Moderate - M	Moderate - M	-	-	-	Weak - L	Weak - L	-	Weak - L	Moderate - M	Moderate - M
					CO4	Distinguish and illustrate the end-to-end implementation pipeline for NLP research problems.	Moderate - M	Moderate - M	Strong-H	Moderate - M	Moderate - M	-	-	-	Weak - L	Weak - L	-	Weak - L	Moderate - M	Moderate - M
52	5	070126	TE7663	Data Visualization Lab	CO1	Understand the key techniques and theory behind data visualization	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Use effectively the various visualization structures	-	Weak - L	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Evaluate information visualization systems and other forms of visual presentation for their effectiveness	Weak - L	-	-	Weak - L	-	-	-	-	-	-	-	-	-	-
					CO4	Design and build data visualization systems.	-	-	-	Weak - L	-	-	-	-	-	-	-	-	-	-
53	5	070126	TE7483	Applications and use cases of Machine Learning	CO1	Analyse the data from multidisciplinary Application domains using Statistical techniques	-	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
					CO2	Solve a problem using Sensor Analytics applied to various domains	-	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
					CO3	Understand and Apply advanced AI/ML techniques to multidisciplinary domains	-	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
					CO4	Apply suitable ML/DL technique in real world applications	-	Moderate - M	Moderate - M	-	-	-	-	-	-	-	-	-	-	-
54	5	070126	T7908	Computer Networks	CO1	Explain computer network concepts and network models.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L	-
					CO2	Describe physical layer functions and data link layer protocols.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L	-
					CO3	Classify IP addressing and explain protocols at network layer and transport layer.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L	-
					CO4	Implement application layer protocols.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L	-
55	5	070126	T7482	Computer Networks Lab	CO1	Explain the networking devices.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L	-
					CO2	Analyze application layer protocols by packet tracer tool.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L	-
					CO3	Analyze packet capturing of various protocols by using Wireshark tool.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L	-
					CO4	Simulate network optimization and traffic shaping algorithms.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L	-
56	5	070126	TE7265	Introduction to Data Science	CO1	Proficient in applying key data science concepts.	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L
					CO2	Use of R language to carry out basic statistical modeling and analysis.	Weak-L	Moderate-M	Weak-L	Moderate-M	Weak-L	-	-	-	-	-	-	-	Weak-L	Moderate-M
					CO3	Capable of recognizing the importance of exploratory data analysis (EDA) in data science and proficient in utilizing various tools to perform EDA effectively.	Weak-L	Moderate-M	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	Moderate-M	Moderate-M
					CO4	Apply basic machine learning algorithms for predictive modeling.	Weak-L	Moderate-M	Moderate-M	Weak-L	Weak-L	-	-	-	-	-	-	-	Moderate-M	Moderate-M
					CO5	Create effective visualization of given data.	-	-	Weak-L	Weak-L	Moderate-M	-	-	-	-	-	-	-	Weak-L	Moderate-M
					CO6	Intrepret ethical and privacy issues in data science conduct.	-	Weak-L	Weak-L	Weak-L	-	-	-	Weak-L	-	-	-	-	Moderate-M	Weak-L
57	5	070126	TE7428	Introduction to Image Processing	CO1	Explain the limitations of the computational methods on digital images.	Strong-H	Moderate-M	-	-	Moderate-M	-	-	-	Moderate-M	-	-	Weak-L	-	-
					CO2	Implement the spatial and frequency domain image transforms to enhance images.	Strong-H	Moderate-M	-	-	Moderate-M	-	-	-	Moderate-M	-	-	Weak-L	-	-
					CO3	Implement the spatial and frequency domain image transforms on the restoration of images.	Strong-H	Moderate-M	-	-	Moderate-M	-	-	-	Moderate-M	-	-	Weak-L	-	-
					CO4	Perform image segmentation operations on images using various computational methods.	Strong-H	Moderate-M	-	-	Moderate-M	-	-	-	Moderate-M	-	-	Weak-L	-	-
					CO5	Apply various mathematical transformations on images to implement Morphological Image Processing.	Strong-H	Moderate-M	-	-	Moderate-M	-	-	-	Moderate-M	-	-	Weak-L	-	-
					CO6	Develop and evaluate the basic image processing algorithms.	Moderate-M	Moderate-M	Moderate-M	-	Moderate-M	-	-	-	Moderate-M	-	-	Weak-L	-	-
58	6	070126	TE7490	Generative Adversarial Networks	CO1	Interpret and apply the fundamental concepts associated with GANs methods.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Apply the basic principles to derive the various Generator and Discriminator Networks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Understand and choose various approaches based on the specific application for designing G and D networks and corresponding loss functions.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Devise the GANs based applications for image to text translation, image generation etc.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO5	Contrast and Correlate and validate the GAN variants for specific applications.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59	6	070126	TE7491	Generative Adversarial Networks Lab	CO1	Implement the fundamental concepts associated with GAN methods.	Weak - L	Weak - L	Weak - L	-	Weak - L	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO2	Implement and demonstrate the basic principles to derive the various Generator and Discriminator Networks and loss functions in Python.	Weak - L	Weak - L	Weak - L	-	-	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO3	Implement and choose various approaches based on the application for designing G and D networks and corresponding loss functions.	Weak - L	Weak - L	Weak - L	-	-	-	-	-	-	-	-	-	Weak - L	Moderate - M
					CO4	Implement and validate the GAN variants for specific applications.	Weak - L	Weak - L	Weak - L	-	Weak - L	-	-	-	-	-	-	-	Weak - L	Moderate - M
60	6	070126	TE7565	Reinforcement Learning	CO1	Understand the mathematics and probabilistic reasoning behind RL methods	Moderate - M	Moderate - M	Weak - L	-	Weak - L	Weak - L	-	-	-	Weak - L	-	Weak - L	Moderate - M	Moderate - M
					CO2	Choose and apply the specific RL algorithm based on the application for model free systems	Moderate - M	Moderate - M	Moderate - M	Weak - L	Weak - L	Weak - L	-	-	Weak - L	Weak - L	-	Weak - L	Moderate - M	Moderate - M
					CO3	Apply the methods for control for model free systems	Moderate - M	Moderate - M	Strong - H	Moderate - M	Moderate - M	Weak - L	-	-	Weak - L	Weak - L	-	Weak - L	Moderate - M	Moderate - M
					CO4	Choose and apply the specific RL algorithm based on the application for model based systems	Moderate - M	Moderate - M	Strong - H	Moderate - M	Moderate - M	Weak - L	-	-	Weak - L	Weak - L	-	Weak - L	Moderate - M	Moderate - M
					CO5	Understand and design the function approximators for RL models	Moderate - M	Moderate - M	Strong - H	Moderate - M	Moderate - M	Weak - L	-	-	Weak - L	Weak - L	-	Weak - L	Moderate - M	Moderate - M
					CO6	Understand and define the process of exploration and exploitation.	Moderate - M	Moderate - M	Strong - H	Moderate - M	Moderate - M	Weak - L	-	-	Weak - L	Weak - L	-	Weak - L	Moderate - M	Moderate - M

61	6	070126	TE7496	Reinforcement Learning Lab	CO1	Explain the fundamental concepts of RL, including the agentenvironment interaction, rewards, policies, value functions, and the notion of learning through trial and error.	Strong - H	Weak - L	-	-	-	-	-	-	-	-	-	-	Strong - H	Moderate - M
					CO2	Implement dynamic programming algorithms like value iteration and policy iteration.	Strong - H	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	Strong - H	Moderate - M
					CO3	Implement model-free RL algorithms like Q-Learning and SARSA	Strong - H	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	Strong - H	Moderate - M
					CO4	Integrate deep learning with RL using Deep Q-Networks (DQN)	Strong - H	Moderate - M	Weak - L	-	-	-	-	-	-	-	-	-	Strong - H	Moderate - M
62	6	070126	T7802	Capstone Course	CO1	Discuss the core theories and concepts	Moderate-M	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
					CO2	Solve coding problems related to core technical concepts	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	Moderate-M	-	-
					CO3	Apply the fundamental technical knowledge for problem solving	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	Moderate-M	-	-
					CO4	Explore technical ideas and case-studies	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
63	6	070126	TE7484	Computer Vision	CO1	Understand basics of computer vision as well as its mission of making computers see	Strong - H	Strong - H	Strong - H	Moderate-M	Moderate-M	Weak - L	-	-	Moderate-M	Moderate-M	-	Moderate-M	Strong - H	Strong - H
					CO2	Learn both image and video recognition, including image classification and annotation, object recognition and image search, various object detection techniques, motion estimation, and artificial intelligence.	Strong - H	Strong - H	Strong - H	Moderate-M	Moderate-M	Weak - L	-	-	Moderate-M	Moderate-M	-	Moderate-M	Strong - H	Strong - H
					CO3	Study various computer vision applications	Strong - H	Strong - H	Strong - H	Moderate-M	Moderate-M	Weak - L	-	-	Moderate-M	Moderate-M	-	Moderate-M	Strong - H	Strong - H
					CO4	Apply deep learning techniques to implement various computer vision concepts on different platforms	Strong - H	Strong - H	Strong - H	Moderate-M	Moderate-M	Weak - L	-	-	Moderate-M	Moderate-M	-	Moderate-M	Strong - H	Strong - H
					CO5	Learn various object detection techniques	Strong - H	Strong - H	Strong - H	Moderate-M	Moderate-M	Weak - L	-	-	Moderate-M	Moderate-M	-	Moderate-M	Strong - H	Strong - H
64	6	070126	TE7261	Internet of Things	CO1	Learn and explore the basics of networking.	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-
					CO2	Experience data collection from sensors using microcontroller device.	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-
					CO3	Demonstrate understanding on CoAP and MQTT protocols.	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
					CO4	Develop clear understanding on IoT Cloud integration .	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
					CO5	Explore on IoT privacy issue and Block chain.	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
65	6	070126	TE7255	Data Warehousing and Mining	CO1	Outline and organize architecture of data warehouse and its components.	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	Moderate-M	Moderate-M	-	-	Moderate-M	Moderate-M
					CO2	Illustrate data mining concepts and algorithms.	-	-	-	-	Strong-H	-	-	-	Moderate-M	Moderate-M	-	-	-	Strong-H
					CO3	Analyze multidimensional data using "Online Analytical Processing" tool.	Moderate-M	-	-	Moderate-M	-	-	-	-	Moderate-M	Moderate-M	-	Moderate-M	-	Strong-H
					CO4	Experiment how to produce a quantitative analysis report/memo with the necessary information to make decisions.	-	-	-	Moderate-M	Strong-H	-	-	-	Moderate-M	Moderate-M	-	Moderate-M	Moderate-M	Strong-H
					CO5	Demonstrate basic data mining algorithms, methods, and tool.	-	-	-	Moderate-M	Strong-H	-	-	-	Moderate-M	Moderate-M	-	Moderate-M	Moderate-M	Strong-H
					CO6	Test and compare different data mining algorithms such as A-priori, Decision Tree Classifier, K-	-	-	-	Moderate-M	-	-	-	-	Moderate-M	Moderate-M	-	-	-	Strong-H
66	6	070126	TE7485	Computer Vision Lab	CO1	Apply techniques for enhancing and preparing images for analysis.	Strong - H	Strong - H	Strong - H	Moderate-M	Strong - H	Weak-L			Moderate-M	Moderate-M		Moderate-M	Strong - H	Strong - H
					CO2	Apply segmentation techniques to partition images into meaningful regions for further processing.	Strong - H	Strong - H	Strong - H	Moderate-M	Strong - H	Weak-L			Moderate-M	Moderate-M		Moderate-M	Strong - H	Strong - H
					CO3	Develop methods to identify and extract relevant features from images for various applications.	Strong - H	Strong - H	Strong - H	Moderate-M	Strong - H	Weak-L			Moderate-M	Moderate-M		Moderate-M	Strong - H	Strong - H
					CO4	Apply neural networks for image recognition and detection.	Strong - H	Strong - H	Strong - H	Moderate-M	Strong - H	Weak-L			Moderate-M	Moderate-M		Moderate-M	Strong - H	Strong - H
67	6	070126	TE7262	Internet of Things Lab	CO1	To experiment and understand the basics of embedded microcontroller and sensors.	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	-	-	-	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H
					CO2	To experiment and understand the interfacing of sensors using GPIO, SPI with Embedded microcontroller.	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	-	-	-	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H
					CO3	To learn and express your understanding of local data storage and data storage on a remote server.	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	-	-	-	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H
					CO4	Express your understanding of messaging protocols such as COAP, and MQTT.	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	-	-	-	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H
					CO5	To synthesize your understanding and develop a farm of communicating base stations.	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	Strong-H	-	-	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H
68	6	070126	TE7013	Data Warehousing and Mining Lab	CO1	Analyze multidimensional data using "Online Analytical Processing" tool	-	-	Strong-H	Strong-H	Strong-H	-	-	-	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H
					CO2	Apply different data pre-processing steps on a data set	Moderate-M	-	Strong-H	Strong-H	-	-	-	-	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H
					CO3	Experiment how to produce a quantitative analysis report/memo with the necessary information to make decisions	Moderate-M	-	-	Strong-H	-	-	-	-	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H
					CO4	Demonstrate basic data mining algorithms, methods, and tool	Moderate-M	-	Strong-H	-	Strong-H	-	-	-	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H
					CO5	Test and compare different data mining algorithms such as A-priori, Decision Tree Classifier, K-means clustering	Strong-H	-	Moderate-M	Strong-H	-	-	-	-	Strong-H	Strong-H	-	Moderate-M	Strong-H	Strong-H
69	6	070126	TE7943	Full Stack Development	CO1	Web Design Proficiency: Students will acquire the ability to design responsive webpages with a registration form using HTML and CSS, demonstrating an understanding of fundamental design principles and layout techniques.	-	Strong - H	-	-	Strong - H	-	-	Strong - H	Strong - H	Strong - H	-	Strong - H	-	-
					CO2	students will showcase proficiency in applying various CSS styles and layouts, allowing them to create visually appealing and well-styled web pages.	-	Strong - H	-	Moderate - M	Strong - H	-	-	Strong - H	Strong - H	Strong - H	-	Strong - H	-	-
					CO3	Through the card-flip effect task, students will gain hands-on experience in implementing Bootstrap components, enhancing their skills in leveraging popular front-end frameworks.	-	-	Strong - H	-	Strong - H	Strong - H	-	Strong - H	Strong - H	Strong - H	-	Strong - H	Strong - H	Strong - H
					CO4	Students will be able to use JavaScript to add interactivity to web pages, including the implementation of pop-up boxes (alert, confirm, prompt) and event handling on form elements, thereby enhancing the user experience and functionality of their web applications.	-	Strong - H	Strong - H	-	Strong - H	Strong - H	Strong - H	Strong - H	Strong - H	Strong - H	-	Strong - H	Strong - H	Strong - H
					CO5	By building interactive interfaces with React components, implementing routing in React JS, and developing a web application with Node.js for NO SQL database interaction, students will achieve proficiency in modern web development technologies.	-	-	Strong - H	-	Strong - H	Strong - H	-	Strong - H	Strong - H	Strong - H	-	Strong - H	Strong - H	Strong - H
70	6	070126	TE7942	Full Stack Development Lab	CO1	Web Design Proficiency: Students will acquire the ability to design responsive webpages with a registration form using HTML and CSS, demonstrating an understanding of fundamental design principles and layout techniques.	-	Strong-H	-	-	Strong-H	-	-	Strong-H	Strong-H	Strong-H	-	Strong-H	-	-
					CO2	students will showcase proficiency in applying various CSS styles and layouts, allowing them to create visually appealing and well-styled web pages.	-	Strong-H	-	Moderate - M	Strong-H	-	-	Strong-H	Strong-H	Strong-H	-	Strong-H	-	-
					CO3	Through the card-flip effect task, students will gain hands-on experience in implementing Bootstrap components, enhancing their skills in leveraging popular front-end frameworks.	-	-	Strong-H	-	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H
					CO4	Students will be able to use JavaScript to add interactivity to web pages, including the implementation of pop-up boxes (alert, confirm, prompt) and event handling on form elements, thereby enhancing the user experience and functionality of their web applications.	-	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H
					CO5	By building interactive interfaces with React components, implementing routing in React JS, and developing a web application with Node.js for NO SQL database interaction, students will achieve proficiency in modern web development technologies.	-	-	Strong-H	-	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H	-	Strong-H	Strong-H	Strong-H
71	6	070126	T2585	Organizational Behaviour	CO1	Describe how behaviour affects the organizational performance and effectiveness	Strong-H	Weak-L	Weak-L	Weak-L	Moderate-M	-	-	Weak-L	-	Moderate-M	Weak-L	Moderate-M	Moderate-M	-
					CO2	Identify the factors affecting individual behaviour at work place	Strong-H	Moderate-M	Weak-L	Weak-L	Moderate-M	-	-	Weak-L	-	Moderate-M	Weak-L	Moderate-M	Moderate-M	-
					CO3	Demonstrate the importance of team dynamics in organizations	Strong-H	Moderate-M	Weak-L	Weak-L		-	-	Weak-L	-	Moderate-M	Weak-L	Strong-H	Moderate-M	-
					CO4	Appreciate the differences in organizational cultural values.	Strong-H	Moderate-M	Weak-L	Weak-L	Moderate-M	-	-	Weak-L	-	Moderate-M	Weak-L	Moderate-M	Moderate-M	-
					CO5	Distinguish between the characteristics of managers and leaders.	Strong-H	Strong-H	Weak-L	Weak-L	Moderate-M	-	-	Weak-L	-	Moderate-M	Weak-L	Moderate-M	Moderate-M	-
72	6	070126	TE7756	Open Source Technologies	CO1	Relate to the idea of adoption of Open Source Software (OSS) and Public Domain Software (PDS) in software development process.	Moderate-M	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
					CO2	Identify and outline the need for licenses and patents.	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	Moderate-M	-	-
					CO3	Analyze the basic idea of open source technology, their software development	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	Moderate-M	-	-
					CO4	Examine and analyze various open source software and tools,Outline and distinguish between open source and closed source technologies.	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	Moderate-M	-	-
					CO5	Outline and distinguish between open source and closed source technologies.	Moderate-M	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
73	6	070126	TE7264	Introduction to BIGDATA	CO1	Describe big data and its importance	Moderate-M	Weak-L	-	-	Weak-L	-	-	-	-	-	-	-	-	-
					CO2	Compare MapReduce-1 and MapReduce-2 frameworks for solving Big data problems	Moderate-M	Moderate-M	-	-	Weak-L	-	-	-	-	-	-	-	-	-
					CO3	Differentiate Hive and RDBMS	Moderate-M	Moderate-M	-	-	Weak-L	-	-	-	-	-	-	-	-	-
					CO4	Apply the technologies Pig for big data analytics	Moderate-M	Moderate-M	-	-	Weak-L	-	-	-	-	-	-	-	-	-
					CO5	Apply the technology Hive for Big data analytics	Moderate-M	Moderate-M	-	-	Weak-L	-	-	-	-	-	-	-	-	-
					CO6	Analyze Query execution performance with in-memory databases like Apache Spark	Moderate-M	Moderate-M	-	-	Weak-L	-	-	-	-	-	-	-	-	-