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(Unit of Alva's Education Foundation (R), Moodbidri)
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Department of Artificial Intelligence and Machine Learning

Course Outcome for the Year 2023-24

CO No.	Course Outcomes	Blooms Level	Target Level
1.	Explain the basic concepts of probability, random variables, probability distribution.	L1,L2,L3	2
2.	Apply suitable probability distribution models for the given scenario.	L1,L2,L3	2
3.	Apply the notion of a discrete-time Markov chain and n-step transition probabilities to solve the given problem.	L1,L2,L3	2
4.	Use statistical methodology and tools in the engineering problem-solving process.	L1,L2,L3	2
5.	Compute the confidence intervals for the mean of the population.	L1,L2,L3	2
6.	Apply the ANOVA test related to engineering problems.	L1,L2,L3	2

CO Numbers	Course Outcomes	Blooms Level	Target Level
BCS302.1	**Apply** the K–Map techniques to simplify various Boolean expressions.	Apply (L3)	2
BCS302.2	**Design** different types of combinational and sequential circuits along with Verilog programs.	Understand (L2)	2
BCS302.3	**Describe** the fundamentals of machine instructions, addressing modes and Processor performance.	Understand (L2)	2
BCS302.4	**Explain** the approaches involved in achieving communication between processor and I/O devices.	Understand (L2)	2
BCS302.5	**Analyze** internal Organization of Memory and Impact of cache/Pipelining on Processor Performance.	Understand (L2)	2

CO Numbers	Course Outcome	Blooms Level	Target Level
BCS303.1	**Explain** the structure and functionality of operating system	Understand (L2)	2
BCS303.2	**Apply** appropriate CPU scheduling algorithms for the given problem.	Apply (L3)	2
BCS303.3	**Analyse** the various techniques for process synchronization and deadlock handling.	Analyze (L4)	2
BCS303.4	**Apply** the various techniques for memory management.	Apply (L3)	2
BCS303.5	**Explain** file and secondary storage management strategies..	Understand (L2)	2
BCS303.6	**Describe** the need for information protection mechanisms	Understand (L2)	2

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CO Numbers	Course Outcomes	Blooms Level	Target Level
BCS304.1	**Understand and Use** relevant data structures like arrays, strings and its basic operations.	Apply (L3)	2
BCS304.2	**Demonstrate and Implement** the operations of stack and queues with the examples.	Analyse(L4) Apply(L3)	2
BCS304.3	**Understand and Implement** linked lists by its operations	Apply(L3)	2
BCS304.4	**Illustrate** the operations of trees and **Implement** the algorithms for binary trees and binary search trees.	Apply(L3)	2
BCS304.5	**Understand and Implement** the applications of graphs, methods for hash table organization and file management.	Apply (L3)	2

CO Numbers	Course Outcomes	Blooms Level	Target Level
BCSL305.1	**Design, Develop** and **implement** programs on array and string operations and its applications.	Apply (L3) Create (L6)	2
BCSL305.2	**Design, Develop** and **implement** programs on Stack, Queue, Linked List operations and its applications.	Apply (L3) Create (L6)	2
BCSL305.3	**Design, Develop** and **implement** programs on Tree, Graph and Heap operations.	Apply (L3) Create (L6)	2
BCSL305.4	**Design, Develop** and **implement** programs on Files, Searching, Sorting and Hashing operations.	Apply (L3) Create (L6)	2

CO No	Course Outcomes – BCS306A	BTL	Target Level
1	Demonstrate proficiency in writing simple programs involving branching and looping structures.	Apply(L3)	2
2	Design a class involving data members and methods for the given scenario.	Apply(L3)	2
3	Apply the concepts of inheritance and interfaces in solving real world problems.	Apply(L3)	2
4	Use the concept of packages and exception handling in solving complex problem	Understand (L2)	2
5	Apply concepts of multithreading, autoboxing and enumerations in program development	Apply(L3)	2

CO Numbers	Course Outcomes	Blooms Level	Target Level
BCS358A.1	Use advanced functions and productivity tools to assist in developing worksheets.	Apply (L3) Create (L6)	2
BCS358A.2	Manipulate data lists using Outline and PivotTables.	Apply (L3) Create (L6)	2
BCS358A.3	Use Consolidation to summarise and report results from multiple worksheets.	Apply (L3) Create (L6)	2
BCS358A.4	Apply Macros and Autofilter to solve the given real world scenario.	Apply (L3) Create (L6)	2

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CO Number	Course Outcomes- BSCK307	BTL	Target Level
1	Communicate and connect to the surrounding.	**Understanding(L2)**	2
2	Create a responsible connection with the society.	**Creating(L6)**	2
3	Involve in the community in general in which they work.	**Understanding(L2)**	2
4	Notice the needs and problems of the community and involve them in problem –solving.	**Understanding(L2)**	2
5	Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems.	**Apply(L3)**	2
6	Develop competence required for group-living and sharing of responsibilities & gain skills in mobilizing community participation to acquire leadership qualities and democratic attitudes.	**Apply(L3)**	2

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CO Numbers	Course Outcomes	Blooms Level	Target Level
BCS401.1	Apply asymptotic notations to understand the performance analysis of algorithms.	L3(Apply)	2
BCS401.2	Develop computational solution to well-known problems using divide and conquer method.	L3(Apply)	2
BCS401.3	Analyse the performance of transform & conquer techniques and space-time tradeoffs	L4(Analyse)	2
BCS401.4	Design and analyse greedy & dynamic-programming algorithms	L3(Apply)	2
BCS401.5	Intepret the computational complexity & limitations of different algorithms.	L2(Understand)	2

Co Numbers	Course Outcomes	BTL	Target Level
BAD402.1	Apply knowledge of agent architecture, searching and reasoning techniques for different applications	Apply(L3)	2
BAD402.2	Compare various Searching and Inferencing Techniques.	Understanding(L2)	2
BAD402.3	Develop knowledge base sentences using propositional logic and first order logic	Apply(L3)	2
BAD402.4	Describe the concepts of quantifying uncertainty.	Understanding(L2)	2
BAD402.5	Use the concepts of Expert Systems to build applications.	Apply(L3)	2

CO Numbers	Course Outcomes	Blooms Level	Target Level
BCS403.1	**Summarize** the concepts of database objects; enforce integrity constraints on a database. **Design** of schema and ER diagram using RDBMS	Understand (L2) Creating [L6]	2
BCS403.2	**Use** the relational model and relational algebra to **interpret** the database. **Use** Structured Query Language (SQL) for database manipulation	Apply [L3]	3
BCS403.3	**Implement** simple database systems for application using embedded and dynamic SQL to interact with databases	Apply [L3]	2
BCS403.4	**Summarize** and **apply** dependencies, normalization algorithms using database design theory on designed databases, **Explain** transaction processing, concurrency control and database recovery protocols	Apply (L3)	2
BCS403.5	**Understand** the concepts related to NoSQL databases.	Understand (L2)	2

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CO No.	Course Outcomes	Blooms Level	Target Level
1.	Apply concepts of logical reasoning and mathematical proof techniques in proving theorems and statements.	L1,L2,L3	2
2.	Demonstrate the application of discrete structures in different fields of computer science.	L1,L2,L3	2
3.	Apply the basic concepts of relations, functions and partially ordered sets for computer representations.	L1,L2,L3	2
4.	Solve problems involving recurrence relations and generating functions.	L1,L2,L3	2
5.	Illustrate the fundamental principles of Algebraic structures with the problems related to computer science & engineering.	L1,L2,L3	2

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
BDSL456B1.1	**Illustrate** the use of MongoDB commands and queries.	Apply (L3)	2
B. L456B1.2	**Illustrate** the role of aggregate pipelines to extract data	Apply (L3)	2
BDSL456B1.3	**Demonstrate** optimization of queries using indexes.	Apply (L3)	2
BDSL456B1.4	**Demonstrate** text search and aggregate pipeline on text search for ctalog data collection	Apply (L3)	2

CO Numbers	Course Outcome	Blooms Level	Target Level
BCSL404.1	**Develop** programs to solve computational problems using suitable algorithm design strategy.	Applying (L3)	2
BCSL404.2	**Compare** algorithm design strategies by developing equivalent programs and observing running times for analysis (Empirical).	Analyze (L4)	2
BCSL404.3	**Make use** of suitable integrated development tools to develop programs.	Applying (L3)	2
BCSL404.4	**Choose appropriate algorithm** design techniques to develop solution to the computational and complex problems.	Applying (L3)	2
BCSL404.5	**Demonstrate** and present the development of program, its execution and running time(s) and record the results/inferences.	Understand (L2)	2

CO Number	Course Outcome	BTL	Target Level
1	Elucidate the basic biological concepts via relevant industrial applications and case studies.	Understand(L2)	2
2	Evaluate the principles of design and development, for exploring novel bioengineering projects.	Evaluating(L5)	2
3	Corroborate the concepts of biomimetics for specific requirements.	Understand(L2	2
4	Think critically towards exploring innovative biobased solutions for socially relevant problems.	Apply(L3) Analyse(L4)	2

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CO Numbers	Course Outcomes	Blooms Level	Target Level
21CS51.1	**Demonstrate** a comprehensive understanding of the core concepts within Automata theory and Theory of Computation	Understand (L2)	2
21CS51.2	**Apply** Regular Expressions, Finite Automata, and Lexical Analysis in recognizing language regularity and tokens, crucial for compiler design.	Apply (L3)	2
21CS51.3	**Construct** Grammars and Automata for various language classes like RL's, CFL's and Decidable Languages.	Apply (L3)	2
21CS51.4	**Utilize** principles from automata theory and the Theory of Computation in the creation and enhancement of compiler designs.	Apply (L3)	2
21CS51.5	**Develop** computational models based on Automata theory for problem-solving and apply these models to enhance compiler design methodologies.	Apply (L3)	2

Course Outcomes: After studying this course, students will be able to:

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CS52.1	Learn the basic needs of communication system.	Remember (L1)	2
21CS52.2	Interpret the communication challenges and its solution.	Understand (L2)	2
21CS52.3	Identify and organize the communication system network components.	Apply (L3)	2
21CS52.4	Design communication networks for user requirements	Create (L4)	2

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CS53.1	**Summarize** the concepts of database objects; enforce integrity constraints on a database. **Design** of schema and ER diagram using RDBMS	Understand (L2) Creating [L6]	2
21CS53.2	**Modify** database by applying relational model and relational algebra. Use Structured Query Language (SQL) for database manipulation	Creating [L6]	3
21CS53.3	**Design** and **build** simple database systems for application using embedded and dynamic SQL to interact with databases	Creating [L6]	3
21CS53.4	**Summarize** and **apply** dependencies, normalization algorithms using database design theory on designed databases	Apply (L3)	3
21CS53.5	**Explain** transaction processing, concurrency control and database recovery protocols.	Understand (L2)	2

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CO Number	Course Outcomes	BTL	Target Level
21AI54.1	Apply knowledge of agent architecture, searching and reasoning techniques for different applications.	**Apply(L3)**	**2**
21AI54.2	Analyse Searching and Inferencing Techniques.	**Analyse(L4)**	**2**
21AI54.3	Develop knowledge base sentences using propositional logic and first order logic	**Apply(L3)**	**2**
21AI54.4	Demonstrating agents, searching and inferencing	**Understanding(L2)**	**2**
21AI54.5	Illustrate the application of probability in uncertain reasoning.	**Understanding(L2)**	**2**

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CSL55.1	Use Structured Query Language (SQL) for database Creation and manipulation.	Understand (L2)	2
21CSL55.2	Demonstrate the working of different concepts of DBMS.	Understand (L2)	3
21CSL55.3	Construct a database by using data definition, data manipulation and control languages	Creating [L6]	3
21CSL55.4	Implement and test the project developed for an application.	Creating [L6]	3

CO Numbers	Course Outcomes	Blooms Level	Target Level
CO1	To know the meaning of engineering research	L1,L2	80%
CO2	To know the procedure of Literature Review and Technical Reading.	L2,L4	80%
CO3	To know the fundamentals of patent laws and drafting procedure.	L1, L2	80%
CO4	Understanding the copyright laws and subject matters of copyrights and designs	L1, L2	80%
CO5	Understanding the basic principles of design rights.	L1, L2	80%

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CO Numbers	Course Outcomes	Blooms Level	Target Level
CO57.1	Understand the principles of ecology and environmental issues that apply to air, land and water issues on a global scale	L1,L2	
CO57.2	Develop critical thinking and or observation skills and apply them to the analysis of problem or question related to the environment	L2,L3	
CO57.3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components.	L2,L3,L5	
CO57.4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.	L4,L5	

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CSL581.1	Develop Angular JS programs using basic features.	Apply (L3)	2
21CSL581.2	Develop Web applications using AngularJS modules.	Apply (L3)	2
21CSL581.3	Make use of form validations and controls for interactive applications.	Apply (L3)	2
21CSL581.4	Apply the concepts of Expressions, data bindings and filters in developing Angular JS programs.	Apply (L3)	2
21CSL581.5	Make use of modern tools to develop Web applications.	Apply (L3)	2

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CO Numbers	Course Outcome	Blooms Level	Target Level
21CS61.1	**Understand** the activities involved in software engineering and analyze the role of various process models.	Understand (L2)	2
21CS61.2	**Explain** the basics of object-oriented concepts and build a suitable class model using modeling techniques.	Analyze (L4)	2
21CS61.3	**Describe** various software testing methods and to understand the importance of agile methodology and DevOps.	Analyze (L4)	2
21CS61.4	**Illustrate** the role of project planning and quality management in software development.	Analyze (L4)	2
21CS61.5	**Understand** the importance of activity planning and different planning models.	Understand (L2)	2

CO Numbers	Course Outcomes	BTL	Target Level
21AD62.1	Identify and demonstrate data using visualization tools.	**Apply(L3)**	**2**
21AD62.2	Make use of Statistical hypothesis tests to choose the properties of data, curate and manipulate data.	**Understand(L2)**	**2**
21AD62.3	Utilize the skills of machine learning algorithms and techniques and develop models.	**Apply(L3)**	**2**
21AD62.4	Demonstrate the construction of decision tree and data partition using clustering.	**Understand(L2)**	**2**
21AD62.5	Experiment with social network analysis and make use of natural language processing skills to develop data driven applications.	**Apply(L3)**	**2**

CO Numbers	Course Outcomes	Blooms Level	Target Level
21AI63.1	**Understand** the concept of Machine Learning and Concept Learning.	Apply (L3)	2
21AI63.2	**Explain** the concepts of supervised, unsupervised and reinforcement learning.	Analyse(L4) Apply(L3)	2
21AI63.3	**Analyse** various searching for solutions, machine learning techniques, and classification techniques.	Apply(L3)	2
21AI63.4	**Apply the ML** concept in a decision tree structure and implementation of Ensemble learning and Random Forest.	Apply(L3)	2
21AI63.5	**Apply Bayes techniques and** explore more about the classification in ML.	Apply (L3)	2

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CO Numbers	Course Outcomes	Blooms Level	Target Level
21CS642.1	**Interpret** the need for advanced Java concepts like enumerations and annotations in developing modular and efficient programs	Understand (L2)	2
21CS642.2	**Apply** the concepts of Generic classes in Java programs	Apply (L3)	2
21CS642.3	**Illustrate** the use of string handling functions.	Apply (L3)	2
21CS642.4	**Describe** how servlets fit into Java-based web application architecture	Apply (L3)	2
21CS642.5	**Illustrate** database access and details for managing information using the JDBC API	Apply (L3)	2

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CV654.1	Apprehend various components of land as a natural resource and land use planning.	Understand (L2) Apply (L3)	2
21CV654.2	Know availability and demand for water resources as applied to India.	Apply (L3)	2
21CV654.3	Analyse the components of air as resource and its pollution.	Understand (L2) Apply (L3)	2
21CV654.4	Discuss biodiversity & its role in ecosystem functioning.	Remember (L1) Understand (L2)	2
21CV654.5	Critically appreciate the environmental concerns of today	Understand (L2)	2

CO Numbers	Course Outcomes	Blooms Level	Target Level
21CV654.1	Apprehend various components of land as a natural resource and land use planning.	Understand (L2) Apply (L3)	2
21CV654.2	Know availability and demand for water resources as applied to India.	Apply (L3)	2
21CV654.3	Analyse the components of air as resource and its pollution.	Understand (L2) Apply (L3)	2
21CV654.4	Discuss biodiversity & its role in ecosystem functioning.	Remember (L1) Understand (L2)	2
21CV654.5	Critically appreciate the environmental concerns of today	Understand (L2)	2

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CO Numbers	Course Outcomes	Blooms Level	Target Level
18AI71.1	**Remember & Understand, Introduction to Intelligent Agents, Problem solving and Game playing:** Knowledge of Artificial Intelligence to write simple algorithm for agents and knowledge to solve problem based on state space search and adversarial search control strategies.	(L1,L2)	2
18AI71.2	**Remember & Understand, Knowledge, Uncertainty and Reasoning:** The AI knowledge to solve problem on search algorithm to reduce the complexity as well as reasoning to deal with uncertainty.	(L1,L2)	2
18AI71.3	**Remember & Understand, the Probabilistic Reasoning:** Develop knowledge with uncertain domain and Bayesian network with conditional distribution.	(L1,L2)	2
18AI71.4	**Remember & Understand, the Perception:** The image processing and formation, 3d world, structural recognition and vision based object recognition.	(L1,L2)	2
18AI71.5	**Remember & Understand, the overview and language modeling:** Overview of NLP and its application like information retrieval and grammar and statistical language modeling.	(L1,L2)	2

CO Numbers	Course Outcomes	Blooms Level	Target Level
18AI72.1	**Explain** the Gradient Descent algorithm, Scikit-learn library for ML, Advanced Regression models, Advanced ML algorithms, KNN, ensemble methods and Forecasting.	Understand (L2)	2
18AI72.2	**Analyse** the Hidden Markov Model and explain Issues in HMM (Evalution, decoding, learning, classifier), Types of clustering, Partitioning methods of clustering (k-means, k-medoids), hierarchical methods.	Analyse (L4)	2
18AI72.3	**Explain the recommender System:** Datasets, Association rules, Collaborative filtering, User-based similarity, item-based Similarity, using surprise library, Matrix factorization and **illustrate** Sentiment Classification, Naïve Bayes model for sentiment classification.	Understand (L2)	2
18AI72.4	**Apply** the Neural networks and genetic algorithms, Evolution of Neural network, Biological neuron, Basics of ANN, Activation function, MP model.	Apply (L3)	2
18AI72.5	**Explain** instant based learning and learning set of rules: Evaluating Hypothesis: Motivation, Estimating hypothesis accuracy, Basics of sampling theorem, General approach for deriving confidence intervals, Difference in error of two hypothesis, Comparing learning algorithms.	Understand (L2)	2

CO Numbers	Course Outcome	Blooms Level	Target Level
18AI731.1	**Interpret** the impact and challenges posed by IoT networks leading to new architectural models.	Understand (L2)	2
18AI731.2	**Compare** and contrast the deployment of smart objects and the technologies to connect them to network.	Understand (L2)	2
18AI731.3	**Appraise** the role of IoT protocols for efficient network communication.	Analyze (L4)	2
18AI731.4	**Elaborate** the need for Data Analytics and Security in IoT.	Analyze (L4)	2
18AI731.5	**Illustrate** different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.	Apply (L3)	2

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CO Numbers	Course Outcomes	Blooms Level	Target Level
18AI742.1	**Demonstrate** the concepts of fundamental image processing techniques required for computer vision	Understand (L2)	2
18AI742.2	**Understand** Image formation process	Understand (L2)	2
18AI742.3	**Apply** the Techniques like stereopsis to understand the shape of the pictures or images.	Apply (L3)	2
18AI742.4	**Develop** applications using computer vision techniques like Segmentation, Image representation, Grouping and Model fitting, Motion of object given sequence of images	Apply (L3)	2
18AI742.5	**Understand** video processing and motion computation	Understand (L2)	2

CO Numbers	Course Outcomes	Blooms Level	Target Level
CO1	Understand the basic safety terms , international standards, to Identify the hazards , Risk analysis , and Sign boards around the work and environment.	Understand (Level 2)	60%
CO2	Recognise the types of fires extinguishers and the Fire hazards for its prevention and control	Understand (Level 2)	60%
CO3	Understand the mechanical hazards that occur in workshops and machine shops, along with how to prevent and control them.	Understand (Level 2)	60%
CO4	Understand the Electrical hazards that occur in work environment, along with how to prevent and control them.	Understand (Level 2))	60%
CO5	Understand the Chemical hazards that occur in work environment, along with how to prevent and control them.	Understand (Level 2)	60%

CO Numbers	Course Outcomes	Blooms Level	Target Level
18CV753.1	Possess a sound knowledge of National policies on environment.	L1, L2,L3	2
18CV753.2	Apply pollution prevention and Cleaner technology for sound Environmental Management.	L1, L2,L3	2
18CV753.3	Develop, Implement, maintain Environmental Management systems for Organisations.	L1, L2,L3	2
18CV753.4	Lead pollution prevention assessment team and implement waste minimization options.	L1, L2,L3	2
18CV753.5	Audit Environmental Management systems for Organisations	L1, L2,L3	2
18CV753.6	Appreciate the elements of Corporate Environmental Management systems complying to international environmental management system standards.	L1, L2,L3	2

CO Numbers	Course Outcomes	Blooms Level	Target Level
18AIL76.1	**Remember & Understand, Analyze and Implement the Practice Problem** Practice the basic problem to brush up the implementation using python programming. Basics programming concept and implementation.	(L1,L2,L3)	2
18AIL76.2	**Remember & Understand, Analyze and implement the operations and method based on Mini Project.**	(L1,L2,L3)	2

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Department of Artificial Intelligence and Machine Learning

Course Outcome for the Year 2023-24

CO Number	Course Outcomes	BTL	Target Level
18AI81.1	Identify the deep learning algorithms which are more appropriate for various types of learning tasks in various domains.	**Apply(L3)**	2
18AI81.2	Implement deep learning algorithms and solve real-world problems.	**Apply(L3)**	2
18AI81.3	Identify and Implement performance metrics of Deep Learning Techniques.	**Apply(L3)**	2

CO Number	Course Outcomes	BTL	Target Level
18AI823.1	Understand the basic concepts of RPA	**Understanding(L2)**	2
18AI823.2	Demonstrate various components and platforms of RPA	**Understanding(L2)**	2
18AI823.3	Understand the different types of variables, control flow and data manipulation techniques	**Understanding(L2)**	2
18AI823.4	Understand various control techniques and OCR in RPA	**Understanding(L2)**	2
18AI823.5	Illustrate various types and strategies to handle exceptions	**Understanding(L2)**	2

CO Number	Course Outcomes	BTL	Target Level
18AIP83.1	Analyze the real world problem.	**Analyze(L4)**	**2**
18AIP83.2	Select the appropriate tools for solving the problem and Design suitable methodologies	**Create(L6)**	**2**
18AIP83.3	Perceive the art of Verification and Validation	**Evaluating(L5)**	**2**
18AIP83.4	Write the technical report	**Undertsanding (L2)**	**2**

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CO Number	Course Outcomes	BTL	Target Level
18AIS84.1	Understand the current trend and need in Artificial Intelligence and Machine Learning field.	Undertsanding(L2)	2
18AIS84.2	Assimilate the relevance of topic, Make use of Literature Survey	Apply(L3)	2
18AIS84.3	Develop the technical report	Apply(L3)	2
18AIS84.4	Summarize and present the technical concept	Undertsanding (L2)	2

CO Number	Course Outcomes	BTL	Target Level
18AII85.1	Understands tools and technology for implementing real world problems	Undertsanding(L2)	2
18AII85.2	Select appropriate tools for solving problems	Apply(L3)	2
18AII85.3	Develop communication, inter-personality, and critical skills	Apply(L3)	2

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