

	TLO 4.3	Explain Unsupervised Machine Learning Algorithms.
	TLO 4.4	Test the validity of Datasets by applying the Cross-Validation.
CO502.5		Classify the data by performing different Regression Techniques.
	TLO 5.1	Describe different types of Regression.
	TLO 5.2	Differentiate between over fitting and under fitting by example.
	TLO 5.3	Explain the logistic regression techniques.
	TLO 5.4	Explain the logistic regression techniques.
	TLO 5.5	Create classification matrix for given Dataset.

● **Teaching Plan:**

Unit No. (Allotted Hrs.) Marks	Theory Learning Outcomes (TLO)	Title/Topic Details and Course Outcome [CO]	Plan (From -To & No. of Lectures)	Actual Execution (From-To & No. of Lectures)	Teaching Method/ Media/ Tools	Remark
01	Unit - I Basics of AI and Problem Solving Techniques[502.1]					
08 Hrs. 14M	1.1	1.1 Basic Definition and Terminology: Foundation and Evaluation of AI, Scope of AI, Components of AI, Types of AI, Application of AI	17/08/2026 To 18/08/2026 (02)		Chalk Board, PPT+ LCD	
	1.2	1.2 Intelligent Agent in AI: Types of AI agent, Concept of Rationality, Nature of environment, Structure of agents, Turing Test in AI	19/08/2026 (02)			
	1.2	1.3 Search Algorithms in Artificial Intelligence: Properties of Search Algorithms, Types of Search Algorithms.	20/08/2026 To			
	1.3	1.4 Heuristic Search Techniques: Generate-and-Test; Hill Climbing. Properties of A* algorithm, Depth-First Search, Best-First Search, Greedy Best-First, Problem Reduction	24/08/2026 (02)			
	1.4	1.5 Beyond Classical Search: Local search algorithms and optimization problem, Local search in continuous spaces, Searching with nondeterministic action and partial observation, Online search agent and unknown environments	25/08/2026 To 31/08/2026 (02)		Chalk Board, PPT+ LCD	
02	Unit – II Knowledge and Reasoning [505.2]					
06 Hrs. 12M	2.1	2.1 Knowledge-Based Agent in Artificial intelligence: Architecture, Approaches to designing a knowledge-based agent, Techniques of knowledge representation, Propositional logic, Rules of Inference, First-Order Logic, Forward Chaining & Backward Chaining in AI	01/09/2026 To 02/09/2026 (03)		Lecture Using Chalk- Board Presentat ions Flipped Classroom	

	2.2	2.2 Reasoning in Artificial intelligence: Definition of Reasoning, Types of Reasoning	03/09/2026 (01)		Chalk Board, PPT+ LCD, MKCL ERA	
	2.3	2.3 Probabilistic reasoning in AI: Uncertainty, Causes of Uncertainty, Need of probabilistic reasoning in AI, Bayes' Theorem	07/09/2026 To 08/09/2026 (02)			
03	Unit - III Introduction to ML [505.3]					
08 Hrs. 14M	3.1	3.1 History and Evaluation of ML, AI vs ML	09/09/2026 (02)		Chalk Board, PPT+ LCD, MKCL ERA	
	3.2	3.2 Machine Learning Life Cycle: Gathering data, Data Preparation, Data Wrangling, Data Analysis, Train Model,	10/09/2026 To 14/09/2026 (02)			
	3.3	3.3 Different forms of Data: Data Mining, Data Analytics, Statistics Data, Statistics vs. Data Mining, Data Analytics vs Data Science	15/09/2026 To 16/09/2026 (02)			
	3.4	3.4 Dataset for ML: Training Dataset, Testing Datasets, Training vs Testing	16/09/2026 (01)		Chalk Board, PPT+ LCD, MKCL ERA	
	3.5	3.5 Data Cleaning: Missing Data, Outliers	17/09/2026 (01)			
04	Unit - IV Types of Learning[505.4]					
08 Hrs. 14M	4.1	4.1 Types of Learning: Supervised, Unsupervised, Semi-Supervised Learning	23/09/2026 To 24/09/2026 (03)		Chalk Board, PPT+ LCD, MKCL ERA	
	4.2	4.2 Supervised Learning: Learning a Class from Examples, Introduction of different types of Supervised Machine Learning Algorithms: Linear Regression, Logistic Regression, Decision Tree, K - Nearest Neighbors, Random Forest	28/09/2026 To 29/09/2026 (02)			
	4.3	4.3Unsupervised Learning: Introduction of different types of Unsupervised Learning Algorithm: K-means clustering, KNN (k-Nearest Neighbors), Hierarchical Clustering, Neural Networks	30/09/2026 (02)		Chalk Board, PPT+ LCD, MKCL ERA	
	4.4	4.4 Model evaluation: Introduction of Cross-validation, benefits of cross-validation, Positive and Negative class cross-validation	01/10/2026 (01)			
05	Unit - V Regression and Classification[505.4]					
10 Hrs. 16M	5.1	5.1 Linear Regression: Assessing performance of Regression – Error measures, Over fitting and Under fitting, Catalysts for Over fitting	05/10/2026 To 06/10/2026 (02)		Chalk Board, PPT+ LCD,	

	5.2	5.2 Multiple Linear Regression: Multiple Linear regression equation, Implementation of multiple.	07/10/2026 To 08/10/2026 (03)		Demo	
	5.3	linear regression Metrics for Regression: Mean Squared Error (MSE), Root Mean Squared Error (RMSE), Mean Absolute Error (MAE)				
	5.4	5.4 Logistic Regression: Binary and Multiclass Classification, Assessing Classification Performance, Handling more than two classes, Multiclass Classification: One vs One, One vs Rest	09/10/2026 To 12/10/2026 (02)			
	5.5	5.5 Metrics for Classification: Confusion Matrix, AUC/ROC Curve, F1 Score, Accuracy, Precision, Recall	14/10/2026 To 15/10/2026 (03)		Chalk Board, PPT+ LCD, Demo	
		Beyond Syllabus				
40 Hrs. 70M		Revision and Discussion on MSBTE Q. Papers				

COs - POs MATRIX FORM:

AI & ML ALGORITHM

Course Code: 315330

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2
CO1	2	2	1	2	2	-	2	3	2
CO2	2	1	2	2	2	1	2	2	1
CO3	2	1	2	1	2	1	2	2	1
CO4	2	1	2	2	2	1	2	2	3
CO5	2	1	2	2	2	1	2	1	2
Legends :- High:03, Medium:02,Low:01, No Mapping: - PSO1: Apply fundamental concepts of Computer Engineering and Artificial Intelligence and machine Learning to solve technical problems. PSO2: Implement the domain knowledge to achieve successful career as an engineering professional.									

● Theory Assessment Criteria:

A. Theory Assessment (FA-TH & SA- TH):

1. Total Theory weightage for this Course is 100 Marks.
2. Out of 100 Marks, 70 Marks are allotted to MSBTE Theory Examination (SA-TH).
3. Two class tests of 30 marks each conducted during the semester. Average of two class tests, 30 marks are allotted under the head FA-TH.

B. Self-Learning Activity (SLA) Assessment:

1. One Self Learning Activity of 25 Marks are allotted to a group of 2 to 4 students.
2. The activity may be micro project, assignments, report writing or operating system related online course on MOOCS such as NPTEL, Coursera, Infosys Springboard etc.

● References:

A. Books:

Sr.No	Author	Title	Publisher with ISBN Number
1	Stuart Russell and Peter Norvig, Editors	Artificial Intelligence A modern Approach Third edition	Pearson Education, Inc ISBN-13: 978-0-13-604259-4 ISBN-10: 0-13-604259-7
2	Dr. Jeeva Jose	Introduction to Machine Learning with Python	Khanna Book Publishing Co.(P) Ltd. ISBN 9789389139068 ISBN 9789389139068
3	Dipanjan Sarkar Raghav Bali Tushar Sharma	Practical Machine Learning with Python A Solver's Guide to Building Real-World Systems	Apress publication ISBN-13 (pbk): 978-1-4842-3206-4 ISBN-13 (electronic): 978-1-4842-3207-1
4	Andreas C. Müller & Sarah Guido	Introduction to Machine Learning with Python	O'Reilly Media, Inc ISBN 9352134575 ISBN 9789352134571
5	Manaramjan Pradhan, U Dinesh Kumar	Machine Learning using Python	Wiley India ISBN978-81-265-7990-7 ISBN 9 788126 579907

B. Web sites :

Sr. No	Link / Portal	Description
1	https://www.python.org/downloads/	Python IDE download
2	https://www.pdfdrive.com/machine-learning-step-by-step-guide-to-implement-machine-learning-algorithms-with-python-d158324853.html	AI and ML E-Books
3	https://www.geeksforgeeks.org/how-to-install-python-pycharm-	Guidelines for Installation of python
4	https://stackabuse.com/courses/graphs-in-python-theory-and-implementation/lessons/a-star-search-algorithm	A* algorithm
5	https://www.javatpoint.com/turing-test-in-ai	Turing test
6	https://www.v7labs.com/blog/best-free-datasets-for-machine-learning	Datasets

C. Tools:

1. Google Classroom
2. Power Point
3. MKCL Learn Live LMS