K L Deemed to be University
CSE-4 -- KLVZA
Course Handout
2025-2026, Odd Sem

Course Title	:ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
Course Code	:24AD2001
L-T-P-S Structure	: 3-0-2-0
Pre-requisite	:
Credits	: 4
Course Coordinator	:MANKYA PRASUNA PAKALAPATI
Team of Instructors	:
Teaching Associates	:

Syllabus :CO1: Brief History & Paradigms: Symbolic AI, sub symbolic AI, machine learning, the rise of data-driven AI. Intelligent Agents: Rational agents, agent environments, PEAS framework. Problem Formulation: States, transitions, costs, search spaces, applications Classical Search: Uninformed (BFS, DFS, UCS, IDS); Informed (Greedy, A*); Admissible/consistent heuristics; Heuristic Search: Hill climbing, variants of hill climbing Constraint Satisfaction: CSPs, arc consistency, forward checking, backtracking, variable ordering. Game Playing: Minimax, alpha-beta pruning. AI Applications: Search in robotics, logistics, games, expert systems. CO2: Mathematical & Statistical Foundations for ML : Linear Algebra: Vectors, matrices, matrix operations, eigen decomposition, SVD. Calculus & Optimization: Derivatives, gradient descent, convexity, Taylor expansion, optimization objectives. Probability & Statistics: Distributions, expectation, variance, covariance, Bayes' theorem. Data Handling: Noise reduction methods (FFT, etc.), Outlier detection (box plot ,etc..), imputation (using (KNN, Measures of centrality, etc..), scaling(standardization , normalization ,etc..),encoding (one hot vector encoding, image and text embeddings), variable types (ordinal ,categorical) . Feature Engineering: elimination, aggregation, feature selection methods (mutual information, information gain, Fisher score, etc.). Model Selection: Under fitting and Over fitting, Bias-variance trade off, cross-validation, train/val/test splits, learning/validation curves. CO3: Supervised Machine Learning Algorithms: Linear Models: Linear regression, logistic regression, regularization (ridge, lasso). Basic Models: Curse of Dimensionality, KNN, Decision Tree (training & Pruning algorithms) Support Vector Machines: Max-margin principle, soft margin, kernel trick (RBF, polynomial, sigmoid), hyperplane geometry. Ensemble Methods: Bagging, random forests, AdaBoost, stacking. Probabilistic Models: Gaussian Naive Bayes, Gaussian Processes (regression/classification), calibration and confidence. Evaluation: ROC, AUC, confusion matrix, F1, recall/precision, model explainability. CO 4: Unsupervised & Advanced ML + ML Automation Clustering: K-means, C-means, Fuzzy C-Means, GMM, hierarchical, DBSCAN, mean-shift, cluster validity metrics. Dimensionality Reduction: PCA, LDA, t-SNE, UMAP, manifold learning. Anomaly Detection: Isolation forests, LOF, one-class SVM, autoencoders (as preview). Automated ML: Pipeline automation (sklearn, PyCaret), experiment tracking (MLflow). Ethics, Fairness, Explainability: Bias sources, mitigation, transparency, human-in-the-loop.

Text Books :1.Artificial Intelligence: A Modern Approach, Stuart Russell and Peter Norvig, 4th Edition, Pearson, 2020. 2.An Introduction to Statistical Learning: with Applications in R, Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani, 2nd Edition, Springer, 2021. 3.Pattern Recognition and Machine Learning, Christopher M. Bishop, Springer, 2006.

Reference Books :1.Machine Learning: A Probabilistic Perspective, Kevin P. Murphy, MIT Press, 2012. 2.Gaussian Processes for Machine Learning, Carl Edward Rasmussen and Christopher K. I. Williams, MIT Press, 2006.

Web Links :https://www.edx.org/course/cs50s-introduction-to-artificial-intelligence-with-python
https://www.udacity.com/course/intro-to-machine-learning-with-pytorch--ud188
https://www.coursera.org/specializations/mathematics-machine-learning

MOOCS :1.Machine Learning: Supervised and Unsupervised (Coursera, Ng, updated 2025) 2.HuggingFace ML Course (2025 edition) 3.Stanford CS229: Machine Learning (2025 lectures) 4.Udacity: AI Programming with Python Nanodegree (updated 2024/25)
Course Rationale : Artificial Intelligence (AI) and Machine Learning (ML) are transforming industries by enabling intelligent data-driven decision-making and automation. To prepare students for this rapidly evolving technological landscape, it is essential to provide them with the foundational knowledge of AI paradigms, problem-solving techniques, and core mathematical principles underlying ML algorithms. This course is designed to build their competence in developing, evaluating, and applying AI-ML models to real-world problems responsibly. By gaining these skills, students will become industry-ready professionals capable of innovating and contributing effectively in diverse AI-enabled domains.
Course Objectives :1. To introduce students to the history, paradigms, intelligent agents, problem formulation, and classical search techniques in Artificial Intelligence. 2. To strengthen their mathematical and statistical foundations, including linear algebra, calculus, probability, data handling, feature engineering, and model selection for machine learning. 3. To enable students to understand, implement, and evaluate supervised machine learning algorithms, including linear models, decision trees, SVMs, ensemble methods, and probabilistic models. 4. To familiarise them with unsupervised learning techniques, dimensionality reduction, anomaly detection, automated ML tools, and ethical aspects for developing responsible AI applications.

COURSE OUTCOMES (COs):

CO NO	Course Outcome (CO)	PO/PSO	Blooms Taxonomy Level (BTL)
CO1	Formulate, analyze, and solve classical AI problems using search, reasoning, and agent-based approaches.	PO2,PO3,PSO1	3
CO2	Apply mathematical and statistical tools to analyze and prepare data for machine learning.	PSO1,PO3,PO4	4
CO3	Analyze and interpret diverse supervised learning models for regression and classification tasks to determine their suitability and performance for given datasets.	PO4,PO3,PSO1	4
CO4	Implement unsupervised learning, advanced ML workflows, and address ethical AI/ML issues.	PSO1,PO3,PO5,PO8	4
CO5	Develop and evaluate AI and ML models using search algorithms, statistical methods, supervised and unsupervised learning techniques, and automated pipelines to address practical data-driven problems.	PSO1,PO3,PO4,PO5	5

COURSE OUTCOME INDICATORS (COIs)::

Outcome No.	Highest BTL	COI-1	COI-2	COI-3	COI-4	COI-5
CO1	3	**Btl-1** Recall basic definitions of Artificial Intelligence, search algorithms, and agent concepts.	**Btl-2** Explain AI paradigms, agent concepts, and problem formulation techniques	**Btl-3** Apply uninformed and informed search algorithms to solve defined AI problems		
CO2	4	**Btl-1** Recall fundamental	**Btl-2** Understand mathematical	**Btl-3** Apply data preprocessing,	**Btl-4** Analyse datasets to identify	

		mathematical and statistical terminologies used in data analysis and machine learning.	concepts and preprocessing techniques used in ML	feature engineering, and selection techniques	suitable preparation and transformation methods	
CO3	4	**Btl-1** Recall basic programming constructs and mathematical functions relevant to implementing supervised learning models.	**Btl-2** Understand concepts of linear models, SVMs, decision trees, and ensembles	**Btl-3** Apply supervised algorithms to build regression and classification models	**Btl-4** Analyse model performance using evaluation metrics	
CO4	4	**Btl-1** Recall basic data types and statistical measures necessary for understanding unsupervised learning concepts.	**Btl-2** Understand principles of unsupervised learning and ethical AI concepts	**Btl-3** Apply unsupervised learning algorithms and ML automation tools	**Btl-4** Analyse results of unsupervised models and ML workflows	**Btl-4** Evaluate workflows considering ethics, fairness, and transparency
CO5	5	**Btl-1** Recall basic programming logic, control structures, and statistical terms used in AI and ML implementations.	**Btl-2** Understand the fundamental working principles of AI search algorithms, statistical techniques, supervised and unsupervised learning methods, and automated ML pipelines.	**Btl-3** Apply AI and ML algorithms to develop data-driven	**Btl-3** Analyse performance of AI/ML models and automated pipelines	**Btl-5** Evaluate end-to-end AI/ML solutions for effectiveness and applicability

PROGRAM OUTCOMES & PROGRAM SPECIFIC OUTCOMES (POs/PSOs)

Po No.	Program Outcome

Lecture Course DELIVERY Plan:

Sess.No.	CO	COI	Topic	Book No[CH No] [Page No]	Teaching-Learning Methods	EvaluationComponents
1	CO1	COI-2	Handout Discussion, Course Overview & Expectations	TB1 [Ch1] [Pg1-10]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1

Sess.No.	CO	COI	Topic	Book No[CH No] [Page No]	Teaching-Learning Methods	EvaluationComponents
2	CO1	COI-2	Symbolic AI, subsymbolic AI, machine learning, rise of data-driven AI.	TB1 [Ch1] [Pg1-10]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1
3	CO1	COI-2	Rational agents, agent environments, PEAS examples.	TB1 [Ch2] [Pg34-45]	LTC,PPT,Talk	ALM,End Semester Exam,SEM-EXAM1
4	CO1	COI-2	States, transitions, costs, search spaces, applications.	TB1 [Ch3] [Pg78-85]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1
5	CO1	COI-3	BFS, DFS.	TB1 [Ch3] [Pg87-95]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1
6	CO1	COI-3	UCS, IDS.	TB1 [Ch3] [Pg95-105]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1
7	CO1	COI-3	Greedy, A*, admissible/consistent heuristics.	TB1 [Ch3] [Pg105-120]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1
8	CO1	COI-3	Hill climbing, variants.	TB1 [Ch4] [Pg121-128]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1
9	CO1	COI-3	CSPs introduction, arc consistency.	TB1 [Ch6] [Pg210-220]	LTC,PPT,Talk	ALM,End Semester Exam,SEM-EXAM1
10	CO1	COI-3	Forward checking, backtracking, variable ordering.	TB1 [Ch6] [Pg221-230]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1
11	CO1	COI-3	Minimax algorithm, alpha-beta pruning, applications in games.	TB1 [Ch5] [Pg160-175]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1
12	CO1	COI-3	Applications in robotics, logistics, expert systems + CO1 revision.	TB1 [Ch1,2] [Pg10-20,40-50]	LTC,PPT,Talk	End Semester Exam,Home Assignment,SEM-EXAM1
13	CO2	COI-1	Linear Algebra :Vectors, matrices, matrix operations, eigendecomposition, SVD.	TB2 [Ch2] [Pg25-40], TB2 [Ch4] [Pg75-85]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1
14	CO2	COI-2	Calculus & Optimization - Derivatives, gradient descent.	TB2 [Ch4] [Pg86-95]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1
15	CO2	COI-2	Calculus & Optimization	TB2 [Ch5] [Pg110-125]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1

Sess.No.	CO	COI	Topic	Book No[CH No] [Page No]	Teaching-Learning Methods	EvaluationComponents
			:Convexity, Taylor expansion, optimization objectives.			
16	CO2	COI-1	Probability & Statistics :Distributions, expectation, variance, covariance.	TB2 [Ch5] [Pg110-125]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1
17	CO2	COI-2	Probability & Statistics :Bayes' theorem and ML relevance.	TB2 [Ch5] [Pg126-135]	LTC,PPT,Talk	End Semester Exam,Home Assignment,SEM-EXAM1
18	CO2	COI-3	Data Handling :Noise reduction (FFT), outlier detection, imputation (KNN, centrality).	TB2 [Ch6] [Pg140-155]	LTC,PPT,Talk	ALM,End Semester Exam,SEM-EXAM1
19	CO2	COI-3	Data Handling :Scaling (standardization, normalization), encoding (one hot, embeddings), variable types.	TB2 [Ch6] [Pg156-170]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM1
20	CO2	COI-3	Feature selection methods (mutual information, information gain, Fisher score).	TB2 [Ch7] [Pg175-185]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM2
21	CO2	COI-4	Under/over fitting, bias-variance tradeoff, cross-validation, train/val/test splits, learning/validation curves.	TB2 [Ch7] [Pg186-200]	LTC,PPT,Talk	ALM,End Semester Exam,SEM-EXAM1
22	CO3	COI-2	Linear regression. Examples	TB2 [Ch3] [Pg50-60]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM2
23	CO3	COI-2	Logistic regression, regularization (ridge, lasso).	TB2 [Ch3] [Pg61-75]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM2
24	CO3	COI-3	Curse of dimensionality, KNN.	TB2 [Ch8] [Pg205-215]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM2
25	CO3	COI-3	Decision Tree training.	TB2 [Ch9] [Pg220-230]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM2
26	CO3	COI-3	Decision Tree pruning, overfitting.	TB2 [Ch9] [Pg231-240]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM2
27	CO3	COI-3	Max-margin principle, soft margin.	TB2 [Ch10] [Pg245-255]	LTC,PPT,Talk	ALM,End Semester Exam,SEM-EXAM2

Sess.No.	CO	COI	Topic	Book No[CH No] [Page No]	Teaching-Learning Methods	EvaluationComponents
28	CO3	COI-3	Kernel tricks (RBF, polynomial, sigmoid), hyperplane geometry.	TB2 [Ch10] [Pg256-265]	LTC,PPT,Talk	End Semester Exam,Home Assignment,SEM-EXAM2
29	CO3	COI-3	Bagging, Random Forests.	TB2 [Ch11] [Pg270-280]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM2
30	CO3	COI-3	AdaBoost, stacking.	TB2 [Ch11] [Pg281-290]	LTC,PPT,Talk	ALM,End Semester Exam,SEM-EXAM2
32	CO4	COI-2	Clustering :K-means, C-means, Fuzzy C-means.	TB2 [Ch13] [Pg315-325]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM2
33	CO4	COI-2	Clustering :GMM, hierarchical, DBSCAN, mean-shift, cluster validity metrics.	TB2 [Ch13] [Pg326-340]	LTC,PPT,Talk	ALM,End Semester Exam,SEM-EXAM2
34	CO4	COI-3	Dimensionality Reduction :PCA, LDA.	TB2 [Ch14] [Pg345-355]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM2
35	CO4	COI-3	Dimensionality Reduction –:t-SNE, UMAP, manifold learning.	TB2 [Ch14] [Pg356-365]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM2
36	CO4	COI-3	Anomaly Detection :Isolation forests, LOF, one-class SVM, autoencoders (preview).	TB2 [Ch15] [Pg370-380]	LTC,PPT,Talk	ALM,End Semester Exam,SEM-EXAM2
37	CO4	COI-4	Automated ML :Pipeline automation (sklearn, PyCaret), experiment tracking (MLflow).	TB3 [Ch16] [Pg385-395]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM2
38	CO4	COI-5	Ethics & Responsible AI :Ethics, fairness, bias mitigation.	TB1 [Ch17] [Pg400-410]	LTC,PPT,Talk	End Semester Exam,Home Assignment,SEM-EXAM2
39	CO4	COI-5	Ethics & Responsible AI – Part 2 & CO4 Revision :Transparency, human-in-the-loop, summary of unsupervised learning, advanced ML, and ethical AI topics.	TB1 [Ch17] [Pg411-420]	LTC,PPT,Talk	End Semester Exam,SEM-EXAM2

Lecture Session wise Teaching – Learning Plan

SESSION NUMBER : 1

Session Outcome: 1 Students shall discuss the course objectives and expectations to plan their learning.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Handout discussion	1	PPT	--- NOT APPLICABLE ---
20	Course overview & expectations	1	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 2

Session Outcome: 1 Students shall explain symbolic and subsymbolic ai paradigms by observing the evolution towards data-driven ai.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Symbolic ai	2	PPT	--- NOT APPLICABLE ---
20	Subsymbolic ai & machine learning, rise of data-driven ai	2	Talk	--- NOT APPLICABLE ---
60	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 3

Session Outcome: 1 Students shall explain rational agents and peas frameworks to model intelligent behaviour.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Rational agents	2	PPT	--- NOT APPLICABLE ---
20	Agent environments & peas examples	2	Talk	--- NOT APPLICABLE

5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 4

Session Outcome: 1 Students shall explain problem formulation concepts to represent ai problems effectively.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	States, transitions, costs	2	PPT	--- NOT APPLICABLE ---
20	Search spaces & applications	2	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 5

Session Outcome: 1 Students shall apply bfs and dfs algorithms to solve defined search problems.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Bfs	3	PPT	--- NOT APPLICABLE ---
20	Dfs	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 6

Session Outcome: 1 Students shall apply ucs and ids algorithms to achieve optimal and complete search solutions.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods

5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Ucs	3	PPT	--- NOT APPLICABLE ---
20	Ids	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 7

Session Outcome: 1 Students shall apply greedy and a* search algorithms using admissible and consistent heuristics for problem solving.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Greedy search	3	PPT	--- NOT APPLICABLE ---
20	A* search, admissible/consistent heuristics	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 8

Session Outcome: 1 Students shall apply hill climbing and its variants to solve optimization problems.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Hill climbing	3	PPT	--- NOT APPLICABLE ---
20	Variants of hill climbing	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 9

Session Outcome: 1 Students shall apply csp techniques to establish arc consistency in constraint networks.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Csps introduction	3	PPT	--- NOT APPLICABLE ---
20	Arc consistency	3	Talk	Problem-Based Learning
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 10

Session Outcome: 1 Students shall apply forward checking

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Forward checking	3	PPT	--- NOT APPLICABLE ---
20	Backtracking & variable ordering	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 11

Session Outcome: 1 Students shall apply minimax and alpha-beta pruning algorithms to design game playing strategies.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Minimax algorithm	3	PPT	--- NOT APPLICABLE ---

20	Alpha-beta pruning, game applications	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 12

Session Outcome: 1 Students shall apply ai search and reasoning techniques to real-world applications in robotics

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Ai applications in robotics & logistics	3	PPT	--- NOT APPLICABLE ---
20	Games, expert systems, co1 revision	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 13

Session Outcome: 1 Students shall recall linear algebra concepts including vectors

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Vectors, matrices, matrix operations	1	PPT	--- NOT APPLICABLE ---
20	Eigendecomposition, svd	1	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 14

Session Outcome: 1 Students shall understand derivatives and gradient descent to optimize ml models.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods

5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Derivatives	2	PPT	--- NOT APPLICABLE ---
20	gradient descent	2	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 15

Session Outcome: 1 Calculus & optimization :convexity

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Convexity, taylor expansion	2	PPT	--- NOT APPLICABLE ---
20	optimization objectives	2	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 16

Session Outcome: 1 Students shall recall statistical concepts including distributions

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Distributions, expectation, variance	1	PPT	--- NOT APPLICABLE ---
20	Covariance	1	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 17

Session Outcome: 1 Students shall understand bayes' theorem to apply probabilistic reasoning in ml models.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Bayes' theorem	2	PPT	--- NOT APPLICABLE ---
20	Ml relevance and examples	2	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 18

Session Outcome: 1 Students shall apply noise reduction

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Noise reduction (fft)	3	PPT	--- NOT APPLICABLE ---
20	Outlier detection, imputation (knn, centrality)	3	Talk	Leading question
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 19

Session Outcome: 1 Students shall apply scaling

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Scaling (standardization, normalization)	3	PPT	--- NOT APPLICABLE ---
20	Encoding (one hot, embeddings), variable types	3	Talk	--- NOT APPLICABLE ---

5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 20

Session Outcome: 1 Students shall apply feature selection and model selection techniques to improve ml model performance.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Mutual information	3	PPT	--- NOT APPLICABLE ---
20	Information gain, fisher score	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 21

Session Outcome: 1 Students shall analyse underfitting

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Under/over fitting, bias-variance tradeoff	4	PPT	--- NOT APPLICABLE ---
20	Cross-validation, train/val/test splits, learning/validation curves	4	Talk	Group Discussion
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 22

Session Outcome: 1 Students shall understand linear regression concepts to build predictive models.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---

20	Linear regression concepts	2	PPT	--- NOT APPLICABLE ---
20	Examples & applications	2	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 23

Session Outcome: 1 Students shall understand logistic regression and regularization techniques to build classification models.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Logistic regression	2	PPT	--- NOT APPLICABLE ---
20	Regularization (ridge, lasso)	2	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 24

Session Outcome: 1 Students shall apply knn algorithms and analyse the curse of dimensionality in ml problems.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Curse of dimensionality	3	PPT	--- NOT APPLICABLE ---
20	Knn	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 25

Session Outcome: 1 Students shall apply decision tree training algorithms to develop classification models.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Decision tree concepts	3	PPT	--- NOT APPLICABLE ---
20	Training algorithm	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 26

Session Outcome: 1 Students shall apply pruning techniques to improve decision tree model generalization.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Decision tree pruning	3	PPT	--- NOT APPLICABLE ---
20	Overfitting handling	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 27

Session Outcome: 1 Students shall apply svm max-margin and soft margin principles to classify data effectively.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Max-margin principle	3	PPT	--- NOT APPLICABLE ---
20	Soft margin in svm	3	Talk	Case Study
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 28

Session Outcome: 1 Students shall apply kernel tricks and analyse hyperplane geometry in svms for non-linear classification.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Kernel tricks: rbf, polynomial	3	PPT	--- NOT APPLICABLE ---
20	Sigmoid, hyperplane geometry	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 29

Session Outcome: 1 Students shall apply bagging and random forest techniques to build robust ensemble models.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Bagging concepts	3	PPT	--- NOT APPLICABLE ---
20	Random forests	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 30

Session Outcome: 1 Students shall apply boosting techniques such as adaboost and stacking to enhance classification performance.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Adaboost	3	PPT	--- NOT APPLICABLE

20	Stacking	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 32

Session Outcome: 1 Students shall understand clustering algorithms such as k-means

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	K-means	2	PPT	--- NOT APPLICABLE ---
20	C-means, fuzzy c-means	2	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 33

Session Outcome: 1 Students shall understand advanced clustering algorithms including gmm

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Gmm	2	PPT	--- NOT APPLICABLE ---
20	Hierarchical clustering, dbscan, mean-shift, cluster validity	2	Talk	Seminars
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 34

Session Outcome: 1 Students shall apply pca and lda techniques to reduce dimensionality for data analysis.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods

5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Pca	3	PPT	--- NOT APPLICABLE ---
20	Lda	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 35

Session Outcome: 1 Students shall apply t-sne

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	T-sne	3	PPT	--- NOT APPLICABLE ---
20	Umap, manifold learning	3	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 36

Session Outcome: 1 Students shall apply anomaly detection algorithms to identify outliers in datasets.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Isolation forests	3	PPT	--- NOT APPLICABLE ---
20	Lof, one-class svm, autoencoders (preview)	3	Talk	One minute paper
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 37

Session Outcome: 1 Students shall analyse automated ml workflows using pipeline automation and experiment tracking tools to optimise model development.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Pipeline automation (sklearn, pycaret)	4	PPT	--- NOT APPLICABLE ---
20	Experiment tracking (mlflow)	4	Talk	--- NOT APPLICABLE ---
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 38

Session Outcome: 1 Students shall evaluate ethics

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Ethics principles	3	PPT	--- NOT APPLICABLE ---
20	Fairness & bias mitigation	4	Talk	Debate
5	Summary	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 39

Session Outcome: 1 Students shall evaluate transparency and human-in-the-loop considerations to ensure ethical deployment of ai systems.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
20	Transparency	4	PPT	--- NOT APPLICABLE ---
20	Human-in-the-loop	4	Talk	--- NOT APPLICABLE ---

5	Summary	1	Talk	--- NOT APPLICABLE ---

Tutorial Course DELIVERY Plan: NO Delivery Plan Exists

Tutorial Session wise Teaching – Learning Plan

No Session Plans Exists

Practical Course DELIVERY Plan:

Tutorial Session no	Topics	CO-Mapping
1	Install Jupyter Notebook and demonstrate basic syntax, data types, control flow statements, functions, data structures, and usage of libraries and modules in Python.	CO5
2	Solve a grid maze problem using BFS, DFS, and A* algorithms with visualisation of the agent's path, cost, and explored space.	CO5
3	Build a constraint satisfaction problem model for university timetabling, handling constraints with backtracking and optimising variable selection.	CO5
4	Perform feature engineering on the real-world Titanic dataset by handling missing values, applying scaling and encoding techniques, and visualising data using pairplots.	CO5
5	Predict house prices using linear regression and classify the Iris dataset using logistic regression, analysing feature weights, applying regularisation, and visualising decision boundaries.	CO5
6	Classify non-linearly separable data points using Support Vector Machine with RBF and polynomial kernels, and visualise margins and support vectors.	CO5
7	Compare the accuracy of Random Forest, AdaBoost, and stacking ensemble methods, tune their parameters, and measure feature importance.	CO5
8	Apply Gaussian Process regression to predict noisy sine data and plot the mean, variance, and uncertainty estimates.	CO5
9	Implement Naive Bayes for sentiment classification of short text reviews, visualise probability outputs, and analyse misclassifications.	CO5
10	Evaluate a spam detection model using ROC curve, AUC, confusion matrix, and other metrics; calibrate classification thresholds and explain false positives.	CO5
11	Perform K-Means and hierarchical clustering to segment customer data, visualise the clusters, and compare linkage methods and silhouette scores.	CO5

Tutorial Session no	Topics	CO-Mapping
12	Reduce the dimensionality of Fashion-MNIST dataset to 2D using PCA and t-SNE, plot the reduced data, and interpret visualisations including retained variance.	CO5
13	Detect anomalies in a credit card dataset using Isolation Forest, and report the false alarm rate and detection accuracy.	CO5

Practical Session wise Teaching – Learning Plan

SESSION NUMBER : 1

Session Outcome: 1 Students shall demonstrate python basics using jupyter notebook.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	3	PPT	--- NOT APPLICABLE ---
20	Introduction to jupyter notebook, python basics, syntax, data types, control flow, functions, data structures, libraries and modules.	2	PPT	--- NOT APPLICABLE ---
50	Practice writing python programs using jupyter notebook covering all the explained concepts.	3	LTC	--- NOT APPLICABLE ---
20	Evaluation & viva	4	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 2

Session Outcome: 1 Students shall apply bfs

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	3	PPT	--- NOT APPLICABLE ---
20	Explanation of concepts of bfs, dfs, and a* algorithms for grid maze solving.	2	PPT	--- NOT APPLICABLE ---

50	Implement bfs, dfs, and a* algorithms to solve grid maze problems and visualise outputs.	4	LTC	--- NOT APPLICABLE ---
20	Evaluation & viva	4	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 3

Session Outcome: 1 Students shall build a university timetable scheduler using csp and backtracking techniques.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	3	PPT	--- NOT APPLICABLE ---
20	Explanation of constraint satisfaction problems and university timetabling constraints with backtracking.	2	PPT	--- NOT APPLICABLE ---
50	Build a csp-based timetable scheduler implementing backtracking and variable selection.	4	LTC	--- NOT APPLICABLE ---
20	Evaluation & viva	4	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 4

Session Outcome: 1 Students shall perform data cleaning and feature engineering on the titanic dataset.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	3	PPT	--- NOT APPLICABLE ---
20	Explanation of concepts of feature engineering including missing value handling, scaling, encoding, and visualisation.	2	PPT	--- NOT APPLICABLE ---
50	Perform data cleaning and feature engineering on the titanic dataset with visualisation.	3	LTC	--- NOT APPLICABLE ---
20	Evaluation & viva	4	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 5

Session Outcome: 1 Students shall implement linear and logistic regression models for prediction and classification tasks.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	3	PPT	--- NOT APPLICABLE ---
20	Explanation of linear and logistic regression algorithms, loss functions, and regularisation.	2	PPT	--- NOT APPLICABLE ---
50	Implement linear regression for house price prediction and logistic regression for iris classification with regularisation.	4	LTC	--- NOT APPLICABLE ---
20	Evaluation & viva	4	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 6

Session Outcome: 1 Students shall classify data using svm with rbf and polynomial kernels.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	3	PPT	--- NOT APPLICABLE ---
20	Explanation of support vector machines, kernel tricks, and hyperplane concepts.	2	PPT	--- NOT APPLICABLE ---
50	Classify non-linear data using svm with rbf and polynomial kernels and visualise results.	4	LTC	--- NOT APPLICABLE ---
20	Evaluation & viva	4	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 7

Session Outcome: 1 Students shall compare ensemble methods including random forest

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods

5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	3	PPT	--- NOT APPLICABLE ---
20	Explanation of ensemble learning concepts: bagging, boosting, and stacking.	2	PPT	--- NOT APPLICABLE ---
50	Implement random forest, adaboost, and stacking models	4	LTC	--- NOT APPLICABLE ---
20	compare accuracies and feature importance.	4	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 8

Session Outcome: 1 Students shall apply gaussian process regression to predict noisy data and analyse uncertainty.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	3	PPT	--- NOT APPLICABLE ---
20	Explanation of gaussian process regression theory, kernels, and uncertainty estimation.	2	PPT	--- NOT APPLICABLE ---
50	Apply gp regression to noisy sine data and plot mean, variance, and confidence intervals.	3	LTC	--- NOT APPLICABLE ---
20	Evaluation & viva	4	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 9

Session Outcome: 1 Students shall implement naive bayes for sentiment classification of text reviews.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	3	PPT	--- NOT APPLICABLE ---

20	Explanation of naive bayes classification concepts and text data processing.	2	PPT	--- NOT APPLICABLE ---
50	Implement naive bayes for sentiment classification of text reviews and analyse results.	3	LTC	--- NOT APPLICABLE ---
20	Evaluation & viva	4	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 10

Session Outcome: 1 Students shall evaluate model performance using roc

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	3	PPT	--- NOT APPLICABLE ---
20	Explanation of model evaluation metrics: confusion matrix, roc, auc, f1 score.	2	PPT	--- NOT APPLICABLE ---
50	Evaluate spam detection models using these metrics and calibrate thresholds.	5	LTC	--- NOT APPLICABLE ---
20	Evaluation & viva	4	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 11

Session Outcome: 1 Perform K-Means and hierarchical clustering to segment customer data, visualise the clusters, and compare linkage methods and silhouette scores.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	2	PPT	--- NOT APPLICABLE ---
20	Explanation of Program	3	PPT	--- NOT APPLICABLE ---
50	Perform customer segmentation using K-Means and hierarchical clustering, and compare methods.	3	PPT	--- NOT APPLICABLE ---

20	EVALUATION Viva Voce	4	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 12

Session Outcome: 1 Students shall reduce data dimensions using pca and t-sne and interpret visualisations.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	3	PPT	--- NOT APPLICABLE ---
20	Explanation of dimensionality reduction concepts: pca and t-sne.	2	PPT	--- NOT APPLICABLE ---
50	Reduce fashion-mnist data using pca and t-sne and interpret visualisations.	3	LTC	--- NOT APPLICABLE ---
20	Evaluation & viva	4	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 13

Session Outcome: 1 Students shall detect anomalies in credit card datasets using isolation forest and report detection rates.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
5	Attendance	1	Talk	--- NOT APPLICABLE ---
5	Precap & environment setup	3	PPT	--- NOT APPLICABLE ---
20	Explanation of anomaly detection concepts and isolation forest algorithm.	2	PPT	--- NOT APPLICABLE ---
50	Detect anomalies in credit card dataset using isolation forest and report results.	3	LTC	--- NOT APPLICABLE ---
20	Evaluation & viva	4	Talk	--- NOT APPLICABLE ---

Skilling Course DELIVERY Plan: NO Delivery Plan Exists

Skilling Session wise Teaching – Learning Plan

No Session Plans Exists

WEEKLY HOMEWORK ASSIGNMENTS/ PROBLEM SETS/OPEN ENDEDED PROBLEM-SOLVING EXERCISES etc:

Week	Assignment Type	Assignment No	Topic	Details	co
10	Weekly Homework Assignments	3	Supervised Machine Learning Models and Evaluation	Analyze implementation and performance of supervised models (regression, classification, ensemble, probabilistic) using relevant evaluation metrics.	CO3
6	Problem Sets	2	Mathematical Foundations and Data Preparation for ML	Analyze linear algebra, calculus, probability, and data preprocessing techniques to prepare datasets for ML models effectively.	CO2
12	Problem Sets	4	Unsupervised Learning, Advanced ML Workflows, and Ethical AI	Analyze unsupervised learning techniques, automated ML workflows, and ethical considerations in AI applications with practical examples.	CO4
4	Open Ended Problem Solving Exercises	1	Classical AI Problem Solving using Search and Agents	Analyze classical AI problems by formulating, solving using search algorithms, and comparing agent approaches in domains like games, robotics, and expert systems.	CO1

COURSE TIME TABLE:

	Hour	1	2	3	4	5	6	7	8	9
Day	Component									
Mon	Theory	--	--	--	--	--	--	--	--	--
	Tutorial	--	--	--	--	--	--	--	--	--
	Lab	--	--	--	--	--	--	--	--	--
	Skilling	--	--	--	--	--	--	--	--	--
Tue	Theory	---	---	V-S101,V-S102,V-S103,V-S104,V-S105,V-S106,V-S107,V-	V-S101,V-S102,V-S103,V-S104,V-S105,V-S106,V-S107,V-	---	---	V-S201,V-S202,V-S203,V-S204,V-S205,V-S206,V-S207,V-	---	---

				S108,V-S109,V-S110,V-S111,V-S112,V-S113,V-S114,V-S115	S108,V-S109,V-S110,V-S111,V-S112,V-S113,V-S114,V-S115			S208,V-S209,V-S210,V-S211,V-S212,V-S213,V-S214,V-S215,V-S216,V-S217,V-S218,V-S219,V-S220		
	Tutorial	---	---	--	--	---	---	--	---	---
	Lab	---	---	V-S116,V-S116,V-S116,V-S117,V-S117,V-S117,V-S118,V-S118,V-S118,V-S119,V-S119,V-S119,V-S120,V-S120,V-S120,V-S121,V-S121,V-S121,V-S122,V-S122,V-S122	V-S116,V-S116,V-S116,V-S117,V-S117,V-S117,V-S118,V-S118,V-S118,V-S119,V-S119,V-S119,V-S120,V-S120,V-S120,V-S121,V-S121,V-S121,V-S122,V-S122,V-S122	---	---	--	---	---
	Skilling	---	---	--	--	---	---	--	---	---
Wed	Theory	---	---	V-S201,V-S202,V-S203,V-S204,V-S205,V-S206,V-S207,V-S208,V-S209,V-S210,V-S211,V-S212,V-S213,V-S214	V-S201,V-S202,V-S203,V-S204,V-S205,V-S206,V-S207,V-S208,V-S209,V-S210,V-S211,V-S212,V-S213,V-S214	V-S116,V-S117,V-S118,V-S119,V-S120,V-S121,V-S122	V-S116,V-S117,V-S118,V-S119,V-S120,V-S121,V-S122	---	---	---
	Tutorial	---	---	--	--	--	--	---	---	---

	Lab	- - -	- - -	V-S215,V-S215,V-S215,V-S216,V-S216,V-S216,V-S217,V-S217,V-S217,V-S218,V-S218,V-S218,V-S219,V-S219,V-S219,V-S220,V-S220,V-S220	V-S215,V-S215,V-S215,V-S216,V-S216,V-S216,V-S217,V-S217,V-S217,V-S218,V-S218,V-S218,V-S219,V-S219,V-S219,V-S220,V-S220,V-S220	V-S101,V-S101,V-S101,V-S102,V-S102,V-S102,V-S103,V-S103,V-S103,V-S104,V-S104,V-S104,V-S105,V-S105,V-S105,V-S106,V-S106,V-S106,V-S107,V-S107,V-S107,V-S108,V-S108,V-S108,V-S109,V-S109,V-S109,V-S110,V-S110,V-S110,V-S111,V-S111,V-S111,V-S112,V-S112,V-S112,V-S113,V-S113,V-S113,V-S114,V-S114,V-S114,V-S115,V-S115,V-S115	V-S101,V-S101,V-S101,V-S102,V-S102,V-S102,V-S103,V-S103,V-S103,V-S104,V-S104,V-S104,V-S105,V-S105,V-S105,V-S106,V-S106,V-S106,V-S107,V-S107,V-S107,V-S108,V-S108,V-S108,V-S109,V-S109,V-S109,V-S110,V-S110,V-S110,V-S111,V-S111,V-S111,V-S112,V-S112,V-S112,V-S113,V-S113,V-S113,V-S114,V-S114,V-S114,V-S115,V-S115,V-S115	---	- - -	- - -
	Skilling	- - -	- - -	--	--	--	--	---	- - -	- - -
Thu	Theory	- -	- -	--	--	--	--	--	- -	- -
	Tutorial	- -	- -	--	--	--	--	--	- -	- -
	Lab	- -	- -	--	--	--	--	--	- -	- -
	Skilling	- -	- -	--	--	--	--	--	- -	- -
Fri	Theory	- - -	- - -	V-S215,V-S216,V-S217,V-S218,V-S219,V-S220	V-S215,V-S216,V-S217,V-S218,V-S219,V-S220	---	---	V-S101,V-S102,V-S103,V-S104,V-S105,V-S106,V-S107,V-S108,V-S109,V-	- - -	- - -

								S110,V-S111,V-S112,V-S113,V-S114,V-S115,V-S116,V-S117,V-S118,V-S119,V-S120,V-S121,V-S122		
	Tutorial	----	----	--	--	---	---	--	----	----
	Lab	----	----	V-S201,V-S201,V-S201,V-S202,V-S202,V-S202,V-S203,V-S203,V-S203,V-S204,V-S204,V-S204,V-S205,V-S205,V-S205,V-S206,V-S206,V-S206,V-S207,V-S207,V-S207,V-S208,V-S208,V-S208,V-S209,V-S209,V-S209,V-S210,V-S210,V-S210,V-S211,V-S211,V-S211,V-S212,V-S212,V-S212,V-S213,V-S213,V-S213,V-S214,V-S214,V-S214	V-S201,V-S201,V-S201,V-S202,V-S202,V-S202,V-S203,V-S203,V-S203,V-S204,V-S204,V-S204,V-S205,V-S205,V-S205,V-S206,V-S206,V-S206,V-S207,V-S207,V-S207,V-S208,V-S208,V-S208,V-S209,V-S209,V-S209,V-S210,V-S210,V-S210,V-S211,V-S211,V-S211,V-S212,V-S212,V-S212,V-S213,V-S213,V-S213,V-S214,V-S214,V-S214	---	---	--	----	----

	Skilling	---	---	--	--	---	---	--	---	---
Sat	Theory	--	--	--	--	--	--	--	--	--
	Tutorial	--	--	--	--	--	--	--	--	--
	Lab	--	--	--	--	--	--	--	--	--
	Skilling	--	--	--	--	--	--	--	--	--
Sun	Theory	--	--	--	--	--	--	--	--	--
	Tutorial	--	--	--	--	--	--	--	--	--
	Lab	--	--	--	--	--	--	--	--	--
	Skilling	--	--	--	--	--	--	--	--	--

REMEDIAL CLASSES:

Supplement course handout, which may perhaps include special lectures and discussions that would be planned, and schedule notified according

SELF-LEARNING:

Assignments to promote self-learning, survey of contents from multiple sources.

S.no	Topics	CO	ALM	References/MOOCS

DELIVERY DETAILS OF CONTENT BEYOND SYLLABUS:

Content beyond syllabus covered (if any) should be delivered to all students that would be planned, and schedule notified accordingly.

S.no	Advanced Topics, Additional Reading, Research papers and any	CO	ALM	References/MOOCS

EVALUATION PLAN:

Evaluation Type	Evaluation Component	Weightage/Marks		Assessment Dates	Duration (Hours)	CO1	CO2	CO3	CO4	CO5
End Semester Summative Evaluation Total= 40 %	Lab End Semester Exam	Weightage	16		90					16
		Max Marks	50							50
	End Semester Exam	Weightage	24		180	6	6	6	6	
		Max Marks	100			25	25	25	25	
In Semester Formative	Continuous Evaluation -	Weightage	10		90					10

Evaluation Total= 24 %	**Lab Exercise**	Max Marks	120							120
	Home Assignment and Textbook	Weightage	6		90	1.5	1.5	1.5	1.5	
		Max Marks	40			10	10	10	10	
	ALM	Weightage	8		90	2	2	2	2	
		Max Marks	40			10	10	10	10	
In Semester Summative Evaluation Total= 36 %	**Lab In Semester Exam**	Weightage	8		90					8
		Max Marks	50							50
	Semester in Exam-II	Weightage	14		90			7	7	
		Max Marks	50					25	25	
	Semester in Exam-I	Weightage	14		90	7	7			
		Max Marks	50			25	25			

ATTENDANCE POLICY:

Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course
In every course, student has to maintain a minimum of 85% attendance to be eligible for appearing in Semester end examination of the course, for cases of medical issues and other unavoidable circumstances the students will be condoned if their attendance is between 75% to 85% in every course, subjected to submission of medical certificates, medical case file and other needful documental proof to the concerned departments

DETENTION POLICY :

In any course, a student has to maintain a minimum of 85% attendance and In-Semester Examinations to be eligible for appearing to the Semester End Examination, failing to fulfill these conditions will deem such student to have been detained in that course.

PLAGIARISM POLICY :

Supplement course handout, which may perhaps include special lectures and discussions

COURSE TEAM MEMBERS, CHAMBER CONSULTATION HOURS AND CHAMBER VENUE DETAILS:

Supplement course handout, which may perhaps include special lectures and discussions

Name of Faculty	Delivery Component of Faculty	Sections of Faculty	Chamber Consultation Day (s)	Chamber Consultation Timings for each day	Chamber Consultation Room No:	Signature of Course faculty:
Prasanth Yalla	P	108-C	-	-	-	-
Ramesh Kumar Sunkara	L	113-MA,202-MA	-	-	-	-
Ramesh Kumar Sunkara	P	113-A,202-A	-	-	-	-
Seetharama Prasad Mylavarapu	P	112-B	-	-	-	-
S N Lakshmi Malluvalasa	P	211-B	-	-	-	-
Vasantham Kumar	P	122-B	-	-	-	-

Praveena Mandapati	L	104-MA,204-MA	-	-	-	-
Praveena Mandapati	P	104-A,204-A	-	-	-	-
Vidyullatha Pellakuri	P	216-B	-	-	-	-
Lakshmi Lalitha Vuyyuru	L	106-MA,205-MA	-	-	-	-
Lakshmi Lalitha Vuyyuru	P	106-A,205-A	-	-	-	-
Smritilekha Das	L	107-MA	-	-	-	-
Smritilekha Das	P	107-A	-	-	-	-
Jyothi N.M	P	103-C	-	-	-	-
Savaram Mythreya	P	104-C,203-B	-	-	-	-
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Bikram Basaba	P	108-B	-	-	-	-
Aravinth Seshadri	P	106-C	-	-	-	-
Anuradha Thati	P	207-B	-	-	-	-
Asesh Tripathy	P	106-B	-	-	-	-
Basant Sah	L	108-MA	-	-	-	-
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Murali Puttagunta	P	111-C	-	-	-	-
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RAKESH KANCHARLA	P	102-A,215-A	-	-	-	-
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GENERAL INSTRUCTIONS

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

NOTICES

Most of the notices are available on the LMS platform.

All notices will be communicated through the institution email.

All notices concerning the course will be displayed on the respective Notice Boards.

Signature of COURSE COORDINATOR

(MANKYA PRASUNA PAKALAPATI)

Signature of Department Prof. Incharge Academics & Vetting Team Member

Department Of AI&DS

HEAD OF DEPARTMENT:

Approval from: DEAN-ACADEMICS
(Sign with Office Seal) [object HTMLDivElement]