

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING - AI & ML

COURSE MODULE FOR THE SESSION 2026-27(ODD SEMESTER)

Academic Year: 2026 - 2027							
Department: Computer Science & Engineering -AIML							
Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs/ Sessions
				L	T	P	
BAI702	Machine Learning II	Core	ML1	3	0	2	50
Objectives: CLO 1. To introduce concept learning and General to specific learning CLO 2. To learn set of rules using Sequential Covering approach CLO 3. To make decisions on decision by committee CLO 4. To understand similarities using unsupervised learning . CLO 5. To understand Markov Chain Monte Carlo (MCMC) and Graphical Methods.							
Topics Covered as per Syllabus							
Module -1 Introduction: Well-Posed Learning Problems, Designing a Learning System, Perspectives and Issues in Machine Learning. Concept Learning and the General-to-Specific Ordering: A Concept Learning Task, Concept Learning as Search, Find-S: Finding a Maximally Specific Hypothesis, Version Spaces and the Candidate-Elimination Algorithm, Remarks on Version Spaces and Candidate-Elimination, Inductive Bias.							
Module -2 Learning Sets of Rules: Sequential Covering Algorithms, Learning Rule Sets: Example-Based Methods, Learning First-Order Rules, FOIL: A First-Order Inductive Learner. Analytical Learning: Perfect Domain Theories: Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge, Inductive-Analytical Approaches to Learning							
Module -3 Decision by Committee: Ensemble Learning: Boosting: Adaboost , Stumping, Bagging: Subagging, Random Forests, Comparison With Boosting, Different Ways To Combine Classifiers. Unsupervised Learning: The K-MEANS algorithm : Dealing with Noise ,The k-Means Neural Network , Normalisation ,A Better Weight Update Rule ,Using Competitive Learning for Clustering							
Module -4 Unsupervised Learning: Vector Quantisation, the self-organising feature map , The SOM Algorithm, Neighbourhood Connections, Self-Organisation, Network Dimensionality and Boundary Conditions, Examples of Using the SOM. Sampling : Random Numbers ,Gaussian Random Numbers , Monte Carlo Or Bust ,The Proposal Distribution , Markov Chain Monte Carlo.							
Module -5 Graphical Models: Bayesian Networks : Approximate Inference , Making Bayesian Networks , Markov Random Fields , Hidden Markov Models (Hmms), The Forward Algorithm , The Viterbi Algorithm , The Baum–Welch Or Forward–Backward Algorithm , Tracking Methods , The Kalman Filter, The Particle Filter.							

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TextBooks:

1. Tom Mitchell, —Machine Learning, McGraw Hill, 3rd Edition, 1997.
2. Stephen Marsland, “Machine Learning - An Algorithmic Perspective”, Second Edition, CRC Press - Taylor and Francis Group, 2015.

Web links and Video Lectures (e-Resources):

<https://archive.nptel.ac.in/courses/106/106/106106139>

https://www.youtube.com/watch?v=i_LwzRVP7bg

<https://www.youtube.com/watch?v=NWONeJKn6kc>

Course outcomes: The students should be able to:

CO 1. Apply concept learning and General to specific learning

CO 2. Design models to classify supervised data

CO 3. To analyze methods to identify similarities using unsupervised learning

CO 4. To understand Markov Chain Monte Carlo (MCMC) and Graphical Methods

Continuous Internal Evaluation (CIE): The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

SubjectCode	BAI702			Title: Machine Learning II								
List ofCourse Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	Total
CO-1	2	2	1	1	1	1	1	1	1	1	2	14
CO-2	2	2	1	1	1	1	1	1	1	-	2	13
CO-3	3	2	1	2	2	2	2	1	1	-	2	18
CO-4	3	2	1	2	2	2	2	1	1	-	2	18
Total	12	10	05	08	6	6	6	5	4	1	10	63

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The Correlation of Program Specific Outcome's (PSO's) and Course Outcome (CO's)

Subject Code	BAI702	Title: Machine Learning II	
List of Course Outcome's	PSO1	PSO2	Total
CO-1	3	-	3
CO-2	3	-	3
CO-3	3	-	3
CO-4	3	-	3
CO-5	3	-	3
Total	15	-	15

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution

- = No Contribution