

Branch Name:	Bachelor of Technology (COMPUTER ENGINEERING / INFORMATION TECHNOLOGY)
Program Code:	ET103/ET105
Course Title:	Machine Learning [Specialization in AI & ML] Elective-I
Course Code:	2ET1030504T
Pre-requisite Course:	Basics of computer science including algorithms, data structure, Probability theory and Bayesian Concept Learning

Course Objectives:

- The objective of machine learning, closely coupled with the goal of AI, is to achieve a thorough understanding about the nature of learning process (both human learning and other forms of learning)
- Learn computational aspects of learning behaviours, different learning techniques, and to implant the learning capability in computer systems.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
3	3	-	-	3	24	60	16	40	-	-	-	-	100

Course Contents:

Unit No	Topics	Total Hours	Weightage (%)
1	Introduction to Machine Learning: What is human learning? What is Machine Learning? Human learning versus machine learning, Types of machine learning, Applications of machine learning, Tools for machine learning.	04	10
2	Preparing to Model , Feature Engineering: Machine Learning activities, Basic Types of data in Machine Learning, Structures of data, Data Quality and Remediation, Data Pre-Processing, Introduction to Feature Engineering, Feature Transformation, Feature Subset Selection	10	25
3	Modelling and Evaluation: Selecting a Model, Training a Model, Model Representation and Interpretability, Evaluating Performance of a Model, Improving Performance of a Model	08	20
4	Supervised Learning: Classification and Regression: Example of Supervised Learning, Classification Model, Classification Learning Steps, Common Classification, Types of supervised Machine learning Algorithms:	09	22
5	Unsupervised Learning: Unsupervised Learning versus Supervised Learning, Applications of Unsupervised Learning, Clustering, Finding Pattern using Association Rules, Algorithms : K-means clustering, KNN (k-nearest neighbors), Hierarchical clustering, Anomaly detection, Apriori algorithm	09	23

Reference Books:

1. Peter Harrington, “Machine Learning in Action”, DreamTech
2. Michael Bowles, “Machine Learning in Python”, Wiley
3. Gavin Hackling, Mastering Machine Learning with scikit-learn, Packt
4. Giuseppe Bonaccorso, Machine Learning Algorithms - Second Edition, Pack.
5. Tom M Mitchell, “Machine Learning”, McGraw Hill.
6. Peter Harrington, “Machine Learning in Action”, DreamTech.

List of Open-Source Software/learning website:

- www.javatpoint.com/
- <https://www.techtarget.com/>
- <https://www.jmlr.org/mloss/>

Course Learning Outcomes (CLO):

Course Outcomes	Description	Bloom's Taxonomy Level
COL1	Understanding the fundamentals of Machine learning	Understanding (1)
COL2	Study the Preparing to Model , Feature Engineering	Understanding (1) Applying (2)
COL3	Learn Modelling and Evaluation in Machine learning	Understanding (1) Applying (2)
COL4	Learn Classification and Regression technique, Implement Supervised learning algorithm	Understanding (1) Applying(2)
COL5	Learn basic principles of Unsupervised Learning, Implement the unsupervised learning algorithms	Understanding (1) Applying (1)

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	H	M	M													
CLO2	H	M			M							L				
CLO3	H	M			M							L				
CLO4	M	M	M		M							L				
CLO5	M	M										L				

H: High, M: Medium, L: Low