CMMR2	MACHINE LEARNING	L	T	P	C	Int	Ext
		3			3.0	30	70

COURSE OBJECTIVES:

The main objectives of this course are

1. Introduce basic concepts and applications of machine learning
2. Discuss supervised learning and its applications
3. Discuss unsupervised learning and its applications
4. Provide multilayer perceptronâ€™s and kernel tricks

COURSE OUTCOMES:

After successful completion of the course, the students are able to

1. apply the machine learning concepts in real life problems
2. design solutions for classification problems
3. implement clustering algorithms
4. use multilayer perceptronâ€™s

UNIT I *Text Book - 2* [CO:1] **(12)**

Introduction to Machine Learning- What is Machine Learning, Examples of Machine Learning Applications.**Concept learning and the General to Specific Ordering** - Introduction, A concept learning task, Concept learning as search, Find-S: finding a maximally specific hypothesis, Version spaces and the Candidate-Elimination algorithm

UNIT II *Text Book - 1* [CO:2] **(12)**

Supervised Learning- Learning a Class from Examples, Probably Approximately Correct Learning, Noise, Learning Multiple Classes, Regression, Dimensions of a Supervised Machine Learning Algorithm. **Bayesian Decision Theory**- Introduction, Classification, Losses and Risks, Discriminant Functions, Association Rules.

UNIT III *Text Book - 1* [CO:3] **(12)**

Parametric Methods - Introduction, Maximum Likelihood Estimation, Evaluating an Estimator: Bias and Variance, The Bayesâ€™ Estimator, Tuning Model Complexity: Bias/Variance Dilemma.**Clustering**- Introduction, Mixture Densities, k-Means Clustering, Expectation-Maximization Algorithm, Mixtures of Latent Variable Models, Supervised Learning after Clustering, Hierarchical Clustering.

UNIT IV *Text Book - 1* [CO:4] **(12)**

Decision Trees- Decision Trees, Univariate Trees, Pruning, Rule Extraction from Trees, Learning Rules from Data, Multivariate Trees.**Multilayer Perceptronâ€™s**- Introduction, The Perceptron, Training a Perceptron, Learning Boolean Functions, Multilayer Perceptronâ€™s, MLP as a Universal Approximator, Back propagation Algorithm, Training Procedures.

LEARNING RESOURCES:

TEXT BOOK(s):

1. Ethem Alpaydin, Introduction to Machine Learning, MIT Press, Prentice Hall of India, Third Edition 2014
2. Tom Mitchell, Machine Learning, McGraw Hill,1997

REFERENCE BOOK(s):

1. Kevin P. Murphy, Machine Learning: A Probabilistic Perspective, The MIT Press, 2012.
2. Christopher M. Bishop, Pattern Recognition and Machine Learning, Springer, 2006.