

MACHINE LEARNING

VIII Semester: CSE / IT																				
Course Code	Category	Hours / Week			Credits	Maximum Marks														
		L	T	P	C	CIA	SEE	Total												
ACS014	Core	3	-	-	3	30	70	100												
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 45															
<p>I. COURSE OVERVIEW: The main emphasis of this course is to provide systems the ability to automatically learn and improve from experience without being explicitly programmed. The course includes the fundamental concepts to build, train, and predict data models using machine learning (ML) algorithms. This course provides a clear understanding on concepts of supervised learning through decision trees, advanced techniques like neural networks, Naive Bayes and k-nearest neighbor algorithm and introduction to unsupervised and reinforcement learning. Machine Learning has revolutionized industries like medicine, healthcare, manufacturing, banking, and several other industries.</p> <p>II. OBJECTIVES: The course should enable the students to:</p> <ul style="list-style-type: none"> I The fundamental concepts, issues and challenges of machine learning associated to data for model selection. II The supervised learning methods such as decision trees, Naïve Bayes classifier, k-nearest neighbor learning for building data models and basics of unsupervised learning methods. III The knowledge used for making predictions or decisions without human intervention on real-world problems. <p>III. COURSE OUTCOMES: After successful completion of the course, students should be able to:</p> <ul style="list-style-type: none"> CO 1 Demonstrate machine learning concepts with decision trees in data classification for smart and automated applications. Understand CO 2 Make use of support vector machine and multilayer perceptrons to control learning rate in high dimensionality data classification. Apply CO 3 Select probabilistic classifiers with Naive Bayes and graphical models for temporal data classification. Remember CO 4 Outline evolutionary algorithms to solve optimization problems in stochastic manner in machine learning. Remember CO 5 Utilize data clustering algorithms to perform cluster analysis with large categorical datasets in real life data mining applications. Apply CO 6 Identify appropriate machine learning techniques and suitable computing environment for real time applications. Remember <p>IV. SYLLABUS:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">UNIT-I</td> <td style="width: 65%;">TYPES OF MACHINE LEARNING</td> <td style="width: 20%;">Classes: 09</td> </tr> <tr> <td colspan="3">Concept learning: Introduction, version spaces and the candidate elimination algorithm; Learning with trees: Constructing decision trees, CART, classification example.</td> </tr> <tr> <td>UNIT-II</td> <td>LINEAR DISCRIMINANTS</td> <td>Classes: 09</td> </tr> <tr> <td colspan="3">Perceptron (MLP): Going forwards, backwards, MLP in practices, deriving back; Propagation support vector Machines: Optimal separation, kernels.</td> </tr> </table>									UNIT-I	TYPES OF MACHINE LEARNING	Classes: 09	Concept learning: Introduction, version spaces and the candidate elimination algorithm; Learning with trees: Constructing decision trees, CART, classification example.			UNIT-II	LINEAR DISCRIMINANTS	Classes: 09	Perceptron (MLP): Going forwards, backwards, MLP in practices, deriving back; Propagation support vector Machines: Optimal separation, kernels.		
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UNIT-III	BASIC STATISTICS	Classes: 09
<p>Averages, variance and covariance, the Gaussian; The bias-variance tradeoff Bayesian learning: Introduction, Bayes theorem, Bayes optimal classifier, naïve Bayes classifier.</p> <p>Graphical models: Bayesian networks, approximate inference, making Bayesian networks, hidden Markov models, the forward algorithm.</p>		
UNIT-IV	EVOLUTIONARY LEARNING	Classes: 09
<p>Genetic Algorithms, genetic operators; Genetic programming; Ensemble learning: Boosting, bagging; Dimensionality reduction: Linear discriminate analysis, principal component analysis (JAX-RPC).</p>		
UNIT-V	CLUSTERING	Classes: 09
<p>Similarity and distance measures, outliers, hierarchical methods, partitional algorithms, clustering large databases, clustering with categorical attributes, comparison.</p>		
Text Books:		
<ol style="list-style-type: none"> 1. Tom M. Mitchell, "Machine Learning ", McGraw Hill, 1st Edition, 2013. 2. Stephen Marsland, "Machine Learning - An Algorithmic Perspective ", CRC Press, 1st Edition, 2009. 		
Reference Books:		
<ol style="list-style-type: none"> 1. Margaret H Dunham, "Data Mining", Pearson Edition, 2nd Edition, 2006. 2. Galit Shmueli, Nitin R Patel, Peter C Bruce, "Data Mining for Business Intelligence", John Wiley and Sons, 2nd Edition, 2007. 3. Rajjal Shinghal, "Pattern Recognition and Machine Learning", Springer-Verlag, New York, 1st Edition, 2006. 		
Web References:		
<ol style="list-style-type: none"> 1. Http://www.udemy.com/MachineLearning/Online_Course 2. https://en.wikipedia.org/wiki/Machine_learning 		
E-Text Books:		
<ol style="list-style-type: none"> 1. http://www.e-booksdirectory.com/details.php?ebook=1118 2. http://www.otexts.org/sfml 		
Course Home Page:		

