VELAGAPUDI RAMAKRISHNA

SIDDHARTHA ENGINEERING COLLEGE::VIJAYAWADA

(AUTONOMOUS)

DEPARTMENT OF IT

MICRO LEVEL SYLLABUS

Class	**B Tech**	**Regulation**	**VR20**
Subject Code	**20IT6302**	**Year & Semester**	**III Year , II Semester**
Title of the Subject	**Machine Learning**		

Unit No	Content/Topics Covered (mention Sub Topics as found in books)	Text Book	Chapter/ Section No.	Page Number
Unit I	**The ingredients of machine learning**	**[T1]**	**1**	13
	Tasks: The problems that can be solved with machine learning		1.1	14-16
	Evaluating performance of a task		1.1	18-20
	Models : The output of machine learning		1.2	20-21
	Geometric models		1.2	21-25
	Probabilistic models		1.2	25-32
	Logical models		1.2	32-36
	Features: the workhorses of machine learning		1.3	38-40
	Two uses of features		1.3	40-41
	Binary classification and Related tasks		**2**	49-52
	Classification		2.1	52-53
	Assessing classification performance		2.1	53-57
	Visualising classification performance		2.1	58-60
	Beyond binary Classification		**3**	81
	Handling more than two classes		3.1	81-82
	Multi class classification		3.1	82-86
	Regression		3.2	91-94
Unit II	**Decision Tree Learning**	[T2]	3	52
	Introduction		3.1	52
	Decision tree representation		3.2	52-53
	Appropriate problems for decision tree learning		3.3	54-55
	The basic decision tree learning algorithm		3.4	55-59
	Inductive bias in decision tree		3.6	60-63
	Issues in decision tree learning		3.7	66-76
	Linear Models	[T1]	7	196
	The least –squares method		7.1	196-200
	Multivariate linear regression		7.1	201-204
	Regularised regression		7.1	204-205
	Using least-squares regression for classification		7.1	205-207
	Support vector machines		7.3	211-216
	Soft margin SVM		7.3	216-219
	Going beyond linearity with kernel methods.		7.5	224-226
Unit III	**Distance-based Models**	[T1]	8	231
	Ways of Measuring Distance		8.1	231-237
	Nearest-neighbour classification		8.3	242-245
	Distance Based Clustering		8.4	245-247
	K-means algorithm		8.4	247-250
	Clustering around medoids		8.4	250-252
	Hierarchical Clustering		8.5	253-258
	Bayesian Learning	[T2]	6	154
	Introduction		6.1	154-156

	Bayes Theorem		6.2	156-158
	Bayes Optimal Classifier		6.7	174-176
	Naïve Bayes Classifier		6.9	177-179
	Baysian Belief Networks		6.11	184-187
Unit IV	**Artificial Neural Networks**	[T2]	4	81
	Introduction		4.1	81-82
	Neural network representation		4.2	82-83
	Appropriate problems for neural network learning		4.3	83-86
	perceptron		4.4	86-87
	Multilayer networks and the back propagation algorithm		4.5	95
	Differentiable threshold unit		4.5.1	95-97
	The back propagation Algorithm		4.5.2	97-103
	Reinforcement Learning		13	367
	Introduction,		13.1	367
	The Learning task		13.2	367-373
	Q-learning(The Q function, An Algorithm for learning Q)		13.3	373-375

Text Book(s):

[T1] Machine Learning: The art and Science of algorithms that make sense of data, Peter Flach, Cambridge University Press, 2012

[T2] Tom M. Mitchell, Machine Learning, India Edition 2013, McGraw Hill Education

Reference Books:

1. Aurélien Géron, Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems 2nd Edition
2. Stephen Marsland, "Machine Learning – An Algorithmic Perspective", Second Edition, Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014
3. Ethem Alpaydın, Introduction to machine learning, second edition, MIT press.

E-resources and other digital material

[1]. Kevin Murphy,"Machine Learning:A Probabilistic Perspective" , MIT Press, 2012, https://www.cs.ubc.ca/~murphyk/MLbook/pml-intro-5nov11.pdf

[2] Machine Learning by Andrew Ng, Stanford University https://www.coursera.org/learn/machine-learning

[3] Professor S. Sarkar IIT Kharagpur "Introduction to machine learning" , https://www.youtube.com/playlist?list=PLYihddLF-CgYuWNL55Wg8ALkm6u8U7gps

[4] Professor Carl Gustaf Jansson, KTH, Video Course on Machine Learning https://nptel.ac.in/noc/individual_course.php?id=noc19-cs35

Designation	Name in Capitals	Signature with Date
Course Coordinators	Dr. T ANURADHA Dr G KALYANI	
Module Coordinator	Mr Y SANDEEP	
Program Coordinator	Dr.G.KALYANI	
Head of the Department	Dr.M.SUNEETHA	