ECM2002	M2002 Machine Learning Algorithms							
				3 0 0 4 4				
Prerequisite:	ECM1002 - Analysis of Data Structures and Algorithms							
~ ~~								
Course Object								
To introduce the concept of Machine Learning								
<ul> <li>To provide the skills required to handle Linear models</li> </ul>								
<ul> <li>To develop the knowledge about various Learning paradigms</li> </ul>								
To introduce advanced and graph based learning algorithms								
F 4 10								
E <b>xpected Ou</b> The student w								
		:						
• Identify the right learning algorithm for a given problem								
	oply the learning algorithms to real	-						
• De	sign models for supervised and uns	upervisea	learning.					
Student I ear	ning Outcomes (SLO): 2,7,9							
Student Lear	ining Outcomes (SLO). 2,7,7							
Module:1 S	Supervised Learning	6	Hours	SLO: 2				
	Machine Learning – Supervised Learning – Ap	_						
	ression Models	. 1						
	Linear Methods	6	Hours	SLO: 2				
	ssion Models and Least Squares – Subset S							
_	ons. Linear methods for classification – l	Linear Disc	criminant Ar	nalysis – Logisti				
Regression								
Module:3 H	Armongions and Dogularizations	- (	Hours	SLO: 2				
	Expansions and Regularizations	6						
rmering and	Feature extraction – Smoothing splines – K	terner smoo	uning memoc	18 -				
Module:4 N	Model Assessment and Inference	6	Hours	SLO: 2				
	ment and Selection – Model Inference							
	Additive Models – Tree based methods		·6 6, ··;	<i>J</i> ,				
ingomum 1								
ingonum 1								
	earning Paradigms I	7	Hours	SLO:7				
Module:5 I	Learning Paradigms I sis – Nearest Neighbour - Principal Compo	=						
Module:5 I Cluster Analy	sis – Nearest Neighbour - Principal Compo	=						
Module:5 I Cluster Analy Component A	sis – Nearest Neighbour - Principal Componalysis	onents, Mat		tion, Independen				
Module:5 I Cluster Analy Component A Module:6 I	sis – Nearest Neighbour - Principal Componalysis  Learning Paradigms II	onents, Mat	rix Factoriza	tion, Independen SLO:7				
Module:5 I Cluster Analy Component A Module:6 I	sis – Nearest Neighbour - Principal Componalysis	onents, Mat	rix Factoriza	tion, Independen				

Mo	dule:7	Advanced Learning Algorithms	4	Hours	SLO:9			
Random Forests – Ensemble Learning – Graphical Models								
Mo	dule:8	Contemporary Issues	2	Hours				
		Total Lecture:	45	Hours				
Text Books:								
1.	Friedm	nan Jerome, Trevor Hastie, and Robert Tibshirani. The Elements of Statistical Learning.						
	Springe	nger-Verlag, 2 <sup>nd</sup> Edition, 2013.						
2.	Ethem	n Alpaydin,"Introduction to Machine Learning", MIT Press, Third Edition 2014.						
Reference Books:								
1.	Kevin P. Murphy, "Machine Learning: A Probabilistic Perspective", MIT Press, 2012							
2.	Peter F	ter Flach, "Machine Learning: The Art and Science of Algorithms that Make Sense of						
	Data", Cambridge University Press, 2012.							
3.	Michae	Michael Bowles, Machine Learning in Python: Essential Techniques for Predictive						
	Analysis, Wiley, 2015							
Tyı	Typical Projects:				SLO: 9			
	1 Leaning from Data - Datasets for various domains can be downloaded							

- 1. Leaning from Data Datasets for various domains can be downloaded

- Video Analytics
   Speaker Recognition
   Image based object identification