

Autonomous and recognized under 2(F) and 12(B) by UGC
Recognized by AICTE, permanently affiliated to JNTUK Kakinada
Accredited by NAAC with 'A' Grade (2nd Cycle)
Seetharamapurm, Narsapur – 53028 (Andhra Pradesh)

DEPARTMENT OF INFORMATION TECHNOLOGY TEACHING PLAN

Course Code	Course	e Title	Semeste r	Branch	Contact Periods /Week	Academic Year 2023-24		Date of commencement 23-11-2023	
20IT6T01	Machine	Learning	VI	IT	5				
COURSE	OUTCOM	MES					7		
1	Formulate a machine learning problem								
2	Develop a	p and apply regression and classification algorithm							
3	Create a model for decision tree learning								
4	Understand the Bayesian approach for machine learning								
5	Apply unsupervised learning models for handling unknown pattern								
UNIT	Out Comes / Bloom's Level	Topics No.	Topics/ Activity			Text Book/ Ref	Contact Hour	Delivery Method	
	CO-1		Unit-1 Ir	itroductio	n				
		1.1	Well-Posed learning problems			T2	2	Chalk & Board Power point	
I		1.2	Basic concepts, Types of Machine Learning			T2	1		
		1.3	Supervised, unsupervised and reinforcement			T2	2		
		1.4	Goals and applications of machine learning			T2	1		
		1.5	Aspects	raining da	ing a learning ta, concept	Т2	1	presentatio ns Assignment Test	
		1.6	Function	approxim	ation.	T2	1 *		
		1.7	Concept	learning Ir	ntroduction	T2	1		
		1.8	Version S	Spaces and	l the	T2	1 *		
		1.9	Candidat	e Eliminat	ion Algorithm	T2	1		
Content beyond syllabus		1.10	Trends in	Machine	Learning	T1, T3	1		
						Total	12		
п	CO-2		Unit-2 S	upervised	Learning				
		2.1	Regressio	on: Linear	regression	T1,T2	1	Chalk & Board Power point	
		2.2	Polynom	ial regress	ion,	T1,T2	1		
		2.3			ing regression,	T1,T2	1		
		2.4		ng-Underf / Variance	itting problems, tradeoff.	T1,T2	1		
		2.5	Classifica	ation: KN	N	T1,T2	1		
		2.6	SVM-Op	timal Sepa	aration-Kernels	T1,T2	1		



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2.4	Overfitting-Underfitting problems, The bias / Variance tradeoff.	T1,T2	1	Board	
2.5	Classification: KNN	T1,T2	1	Power poi	
2.6	SVM-Optimal Separation-Kernels	T1,T2	1	presentatio	
2.7	Kernel Optimization		1	Assignme	
2.8		CONTROL OF THE PARTY OF THE PAR	1	Test	
			1		
2.10		270,000,000	1		
			10	M.	
	Unit-3 Decision Tree Learning				
3.1	Decision tree representation, appropriate problems for decision tree learning	T1,T2	1	Chalk	
3.2	Univariate Trees (Classification and Regression)	T1,T2	1	& Board	
3.3	Multivariate Trees	T1,T2	1	Power point presentation Assignment Test	
3.4	Basic Decision Tree Learning algorithms	T1,T2	2		
3.5	Hypothesis space search in decision tree learning	T1,T2	1		
3.6	Inductive bias in decision tree learning	T1,T2	1		
3.7	Issues in decision tree learning	T1,T2	1		
3.8	Random Forest	T1,T2	H		
3.9	Introduction to Ensemble techniques	T3,R1	1		
		Total	10		
	Unit-4 Bayesian Learning				
4.1	Bayes theorem and concept learning,	T1,T2,T3	1	CI. II	
4.2	Bayes optimal classifier	T1,T2,T3	1	Chalk &	
4.3	Gibbs algorithm	T1,T2,T3	1	Board	
4.4	Naive Bayes Classifier	T1,T2,T3	1		
4.5 Bayes	Bayesian belief networks	T1,T2,T3	2	Power poi	
4.6	The EM algorithm	T1,T2,T3	1	presentati	
4.7 Gaussi	Gaussian Mixture Model	T1,T2,T3	1	Assignmen	
4.8	MLE and Bayesian Estimate	T1,T2,T3	1		
4.9	Comparison of Gaussian Models	T1,T2,T3	2	Test	
		Total			
	Unit-5 Unsupervised Learning:		7		
5.1	Curse of Dimensionality, Dimensionality Reduction Techniques	T1,T2,T3	1	Chalk &	
5.2	Principal component analysis	T1,T2,T3	1	Board	
5.3	Singular Value Decomposition	T1,T2,T3	"1	Power poi	
	2.5 2.6 2.7 2.8 2.9 2.10 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4.9 5.1 5.2	bias / Variance tradeoff. 2.5 Classification: KNN 2.6 SVM-Optimal Separation-Kernels 2.7 Kernel Optimization 2.8 Linear Discriminant Analysis 2.9 Metrices for accessing classification 2.10 Modelling of Bias and Variance Unit-3 Decision Tree Learning Decision tree representation, appropriate problems for decision tree learning 3.1 Univariate Trees (Classification and Regression) 3.2 Basic Decision Tree Learning algorithms 3.4 Basic Decision Tree Learning algorithms 3.5 Hypothesis space search in decision tree learning 3.6 Inductive bias in decision tree learning 3.7 Issues in decision tree learning 3.8 Random Forest 3.9 Introduction to Ensemble techniques Unit-4 Bayesian Learning 4.1 Bayes theorem and concept learning, 4.2 Bayes optimal classifier 4.3 Gibbs algorithm 4.4 Naive Bayes Classifier 4.5 Bayesian belief networks 4.6 The EM algorithm 4.7 Gaussian Mixture Model 4.8 MLE and Bayesian Estimate 4.9 Comparison of Gaussian Models Unit-5 Unsupervised Learning: Curse of Dimensionality, Dimensionality Reduction Techniques 5.1 Curse of Dimensionality, Dimensionality Reduction Techniques	2.4 bias / Variance tradeoff. 2.5 Classification: KNN 2.6 SVM-Optimal Separation-Kernels 2.7 Kernel Optimization 2.8 Linear Discriminant Analysis 2.9 Metrices for accessing classification 2.10 Modelling of Bias and Variance T1,T2 2.10 Modelling of Bias and Variance T1,T3 Total Unit-3 Decision Tree Learning Decision tree representation, appropriate problems for decision tree learning 3.2 Univariate Trees (Classification and Regression) 3.3 Multivariate Trees 3.4 Basic Decision Tree Learning algorithms Hypothesis space search in decision tree learning 3.5 Hypothesis space search in decision tree learning 3.6 Inductive bias in decision tree learning 3.7 Issues in decision tree learning 3.8 Random Forest 3.9 Introduction to Ensemble techniques T1,T2 3.9 Introduction to Ensemble techniques 4.1 Bayes theorem and concept learning, 4.2 Bayes optimal classifier T1,T2,T3 4.3 Gibbs algorithm T1,T2,T3 4.4 Naive Bayes Classifier T1,T2,T3 4.5 Bayesian belief networks 4.6 The EM algorithm T1,T2,T3 4.7 Gaussian Mixture Model T1,T2,T3 4.8 MLE and Bayesian Estimate T1,T2,T3 Total Unit-5 Unsupervised Learning: Curse of Dimensionality, Dimensionality Reduction Techniques T1,T2,T3 Total Unite-5 Unsupervised Learning: T1,T2,T3 Total	2.4 bias / Variance tradeoff. 2.5 Classification: KNN T1,T2 1 2.6 SVM-Optimal Separation-Kernels T1,T2 1 2.7 Kernel Optimization T1,T2 1 2.8 Linear Discriminant Analysis T1,T2 1 2.9 Metrices for accessing classification T1,T2 1 2.10 Modelling of Bias and Variance T1,T3 1 Total 10 Unit-3 Decision Tree Learning Decision tree representation, appropriate problems for decision tree learning Univariate Trees (Classification and Regression) 3.1 Appropriate Trees (Classification and Regression) 3.2 Regression) 3.3 Multivariate Trees T1,T2 1 3.4 Basic Decision Tree Learning algorithms T1,T2 1 3.5 Hypothesis space search in decision tree learning T1,T2 1 3.6 Inductive bias in decision tree learning T1,T2 1 3.7 Issues in decision tree learning T1,T2 1 3.8 Random Forest T1,T2 1 3.9 Introduction to Ensemble techniques T3,R1 1 Unit-4 Bayesian Learning 4.1 Bayes theorem and concept learning, T1,T2,T3 1 4.2 Bayes optimal classifier T1,T2,T3 1 4.3 Gibbs algorithm T1,T2,T3 1 4.4 Naive Bayes Classifier T1,T2,T3 1 4.5 Bayesian belief networks T1,T2,T3 1 4.7 Gaussian Mixture Model T1,T2,T3 1 4.8 MLE and Bayesian Estimate T1,T2,T3 1 4.9 Comparison of Gaussian Models T1,T2,T3 1 Unit-5 Unsupervised Learning: Curse of Dimensionality, Dimensionality Reduction Techniques T1,T2,T3 1 Unit-5 Unsupervised Learning: T1,T2,T3 1 Unit-5 Unsupervised Learning: T1,T2,T3 1 Unit-5 Principal component analysis T1,T2,T3 1	

A S

Module Coordinator

Programme Coordinator

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		5.4	Introduction to clustering	T1,T2,T3	1	presentatio		
		5.5	Hierarchical: AGNES, DIANA	T1,T2,T3	1	Assignmen		
		5.6	Partitional: K-means clustering, K- Mode Clustering	T1,T2,T3	1	Test		
		5.7	Hierarchical, Spectral, subspace clustering	T1,T2,T3	1			
		5.8	Association rule mining	T1,T2,T3	1			
Content b	Content beyond syllabus 5.9		Shopping example using mining rules T1, R1		2			
				Total	10			
			Cumulative Prop	osed Periods	53			
Text Bo	oks:				4			
S.No.	AUTHOR	RS, BOC	OK TITLE, EDITION, PUBLISHER, YEAR	R OF PUBLIC	ATION	N		
1	Peter Fla Cambrid	Peter Flach, Machine Learning-The Art and Science of Algorithms that Make Sense of Di Cambridge University Press, 2017						
2	T.M. Mit	T.M. Mitchell, "Machine Learning", McGraw-Hill, 199						
3	Saikat D	Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, "Machine Learning", Pearson, 20						
Referen	ce Books:				2			
S.No.	AUTHO	RS, BOO	OK TITLE, EDITION, PUBLISHER, YEA	R OF PUBLIC	ATION	N .		
1	Ethern A	Ethern Alpaydin, "Introduction to Machine Learning", MIT Press, 2004.						
2	Stephen	Stephen Marsland, "Machine Learning -An Algorithmic Perspective", Second Edition, Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014.						
3	Andreas	Andreas C. Müller and Sarah Guido "Introduction to Machine Learning with Python: A Guid for Data Scientists", Oreilly						
Web D	otoile:							
1	vearning	1	achine Learning Yearning" https://www.d		- 1/2			
2	Algorith	ms" Ca	vartz, Shai Ben-David, "Understanding M umbridge University Press .huji.ac.il/~shais/UnderstandingMachineL		3	m Theory to		
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