

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

TEACHING PLAN

Co C	ourse ode	Cours Title	e	Semester	Branches	Contac Period /Week	s s	Acad mic Yea	de c ir	con O	Date of nmencement f Semester
16CS5E04		SOFT COMPUTING		V	CSE A,B,Shift	5	,	2020-21			
COU	COURSE OUTCOMES:										
1	1Identify the difference between Hard Computing and Soft Computing and Know the importance of soft computing. (K1,K2)										
2	Identify the difference between learning and programming and explore practical Applications of Neural Networks (K2)										
3	Analyze	and appraise	e the app	lications whi	ch can use fuzzy	logic.(K4)					
4	4 Explain the efficiency of a hybrid system and how Neural Network and fuzzy logic can be hybridized to form a Neuro-fuzzy network. (K2)										
5	5 Explain derivative based and derivative free optimization techniques.(K2)										
6	Analyze	various appli	ications	of Genetic Al	gorithms. (K4)						
Unit No.	InitOut Comes / Bloom's LevelTopic s No.		Topics/Activity			Te Boo Refe co	ext ok / eren e	Co ao Ho	ont ct our	Delivery Method	
	UNIT-I: Introduction to Soft Computing										
			1.1	Introducti	on to Soft Com	puting	T2	2	1		Chalk,talk
	CO1: differe	Identify the ence	1.2	Soft comp -Neural N - Fuzzy so - Approxi - Derivati	uting Constitue letworks et theory mate reasoning ve-free optimiz	ents g zation	T2	2	2		PPT
Ι	betwe Comp Soft and impor soft co (K1,k	een Hard uting and Computing Know the tance of omputing. (2)	1.3	Characteri Computin - Human e rules) - Biologic computing - New opt (GA, SA, - Numeric symbolic	stics of Neuro g and Soft Com expertise (fuzzy cally inspired g models (NN) imization techn RA) cal computatior AI, only numer	nputing r if-then iques n (no ical)	T2	2	2		Chalk,talk



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			.4	Difference between Hard Computing and Soft Computing	T2	1	Web Resources
		1	.5	Concepts of Learning and Adaptation.	T2	2	NPTEL video
	Content beyond Syllabus (if needed)	f		OPTIMIZATION in soft computing		1	PPT
	, , , , , , , , , , , , , , , , , , , ,				Total		09
				UNIT-II: Neural Networks			
			Ne	ural Networks: Basics of Neural	T3. R1	1	
	CO2: Identify the	2.1.1	Net Net	works: Introduction to Neural	,		Chalk ,talk
	difference	2.1.2	Bic	logical Neural Networks	T3, R1	1	Web Resources
	between	2.1.3	Mc	Culloch Pitt model	T3, R1	1	Chalk, talk
	learning and programmin	2.2.1	Suj Per	Supervised Learning algorithms: Perceptron (Single Layer, Multi layer)		1	Chalk ,talk
II	g and	2.2.2	Lin	ear separability	T3, R1	1	Web Resources
	explore	2.2.3	Del	ta learning rule	T3, R1	1	Web Resources
	practical	2.2.4	Bac	ck Propagation algorithm	T3, R1	1	Chalk ,talk, ppt
	Applications	2.3.1	Un alg	-Supervised Learning orithms: Hebbian Learning	T3, R1	1	PPT
	Networks	2.3.2	Wi	nner take all	T3, R1	1	Web Resources
	(K2)	2.3.3	Sel	f Organizing Maps	T3. R1	1	Chalk .talk
		2.3.4	Lea	urning Vector Quantization	T3, R1	1	PPT
	Content beyond Syllabus (if needed)		Co	nvolutional Neural Networks		1	Chalk ,talk
					Total		12
			r —	UNIT-III: Fuzzy Set Theory	·	<u>г т</u>	
		3.1	3.1.	1 Fuzzy Set Theory: Classical Sets	T1,T4	2	Chalk .talk
	CO3: Analyze	ze	3.1.2 Fuzzy Sets		T 1 T 4		,
	and appraise	e 3.2	3.2.1 Classical Relations		11,14	2	Chalk ,talk,
	the	2.2	3.2. Dre	2 Fuzzy Relations	T1 D2	1	NDTEL video
III	applications	3.5	Fuz	zy extension principle	T1,K2 T1 R2	1	
	which car	1 3.4 3.5	Fuz	zy extension principle	T1 T4	1	ррт
	use tuzzy	/ 3.5	- uZ	1 furrification	T1 T/	1	
	logic.(K4)		5.	5.1 luzzification	11,14	1	
			3.5	5.2 defuzzification	11,14	1	PPT



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	Content						
	beyond		Image Processing		1	Chalk talk	
	Syllabus (if				1	Chark ,tark	
	needed)						
Total						10	
UNIT-IV	V: Hybrid syste						
			Hybrid systems: Introduction to	T1,T2			
		4.1	Hybrid Systems		2	PPT	
	CO4: Explain		Importance of Hybrid systems				
	the efficiency	4.2	reasons to study hybrid systems	T1,T2	1	Chalk ,talk	
	system and		4.2.1 the design of technological T1,T2		1	DDT	
	how Neural		systems		1	111	
	Network and		4.2.2 networked control systems	T1,T2	1	Chalk ,talk	
IV	fuzzy logic		4.2.3 physical processes exhibiting	T1,T2	1	Web Resources	
	can be		non-smooth behavior.		1		
	hybridized to	4.3	Adaptive Neuro Fuzzy Inference	T1,T2	1	Web Resources	
	form a		System (ANFIS)				
	Neuro-fuzzy network. (K2)		4.3.1 ANFIS architecture	T1,T2,	1	Chalk ,talk	
				<u>K2</u>			
			4.3.2 Fuzzification layer	11,R2	1	PPT	
	Content						
	beyond		rent Neural Network			Chalk ,talk, ppt	
	Svllabus (if	Recur					
needed)							
	Total					10	
		UN	IT-V: Introduction to Optimization	Techniques	•		
			Introduction to Optimization	T1,T2,T5			
		5.1	Techniques: Derivative based		1	Web Resources	
			optimization				
	derivative	5.2	Steepest Descent	T1,R2,T5	1	Web Resources,	
	based and		Example of Steepest Descent	T1,R2,T5	1	PPT	
17	derivative	5.3	Newton method	T1,R3,T5	1	Chalk ,talk, ppt	
V	free		Example of Newton method	T1,R3,T5	1	PPT	
	optimization	5.4	5.2 Derivative free optimization:	T5,R1	1	PPT	
	techniques.(<i>E E</i>	Introduction to Evolutionary	T1,R1,T5	1	Wah Deserves	
	K2)	5.5	Concepts			web Resources	
		5.7	Bayesian optimization	T5,R1	1	Chalk ,talk	
		5.8	Genetic algorithms	T5,R3	1	Web Resources	



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			Exaomple of Genetic algorithms	T1,T5		1	NPTEL video	
	Content beyond Syllabus (if needed)	Deep le	arning			1	Chalk ,talk, PPT	
Total							11	
	Unit-VI: Genetic Algorithms and its applications							
	CO6:	6.1	Genetic Algorithms and its applications: Inheritance Operators	T3,T4	1		Web Resources,	
	Analyze	6.2	Cross over types	T3,T4	1		Chalk ,talk, ppt	
	various	6.3	inversion and Deletion	T3,T4	1		PPT	
VI	applications	6.4	Mutation Operator	T3,T4	1		Web Resources	
	Algorithms.	6.5	Bit-wise Operators	T3,T4	1		Chalk ,talk	
	(K4)	6.6	Convergence of GA	T3,T4	1		Web Resources	
		6.7	Applications of GA	T3,T4	1		Chalk ,talk, ppt	
	Content beyond Syllabus (if needed)	genetio	algorithm optimization	1			РРТ	
	Total 8							
	CUMULATIVE PROPOSED PERIODS 60							
Text Bo	t Books:							
5.NO.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION							
1	I Imothy J.Ross "Fuzzy Logic With Engineering Applications" 3 rd edition Wiley							
2	S N Siyanandar	S.N.Sivanandam, S.N.Deepa "Principles of Soft Computing" Second Edition, Wiley Publication.						
2	S.N.Sivanandar	n, S.N.De	epa Principles of soft computing se		, wii	ey P	'UDIICation.	
2 3	S.N.Sivanandar S.Rajasekaran Learning.	and G.A.	Vijayalakshmi Pai "Neural Networks, F	-uzzy Logic a	, wii nd G	ey P iene	tic Algorithms" PHI	
2 3 4	S.N.Sivanandar S.Rajasekaran Learning. JS.R.Jang "Ne	and G.A. uro-Fuzz	y and Soft Computing "PHI 2003.	-uzzy Logic a	, wii nd G	ey P iene	tic Algorithms" PHI	
2 3 4 5	S.N.Sivanandar S.Rajasekaran Learning. JS.R.Jang "Ne Jacek.M.Zurada	uro-Fuzz a "Introd	y and Soft Computing "Neural Networks, F vijayalakshmi Pai "Neural Networks, F vand Soft Computing" PHI 2003.	Euzzy Logic a	, wii nd G Hous	ey P iene se.	tic Algorithms" PHI	
2 3 4 5 Referen	S.N.Sivanandar S.Rajasekaran Learning. JS.R.Jang "Ne Jacek.M.Zurada Ice Books:	and G.A. uro-Fuzz a "Introd	y and Soft Computing "Neural Networks, F vijayalakshmi Pai "Neural Networks, F vand Soft Computing" PHI 2003. uction to Artificial Neural Sytems" Jaic	cond Edition	, will nd G Hous	ey P iene se.	tic Algorithms" PHI	
2 3 4 5 Referen S.No.	S.N.Sivanandar S.Rajasekaran Learning. JS.R.Jang "Ne Jacek.M.Zurada ce Books: AUTHORS,	and G.A. uro-Fuzz a "Introd BOOK	y and Soft Computing "Neural Networks, F vijayalakshmi Pai "Neural Networks, F vand Soft Computing" PHI 2003. uction to Artificial Neural Sytems" Jaic	to Publishing	, will nd G Hous	ey F iene se.	LICATION.	
2 3 4 5 Referen S.No. 1	S.N.Sivanandar S.Rajasekaran Learning. JS.R.Jang "Ne Jacek.M.Zurada ce Books: AUTHORS, Satish Kumar	and G.A. uro-Fuzz a "Introd BOOK "Neural	vijayalakshmi Pai "Neural Networks, F y and Soft Computing" PHI 2003. uction to Artificial Neural Sytems" Jaic TITLE, EDITION, PUBLISHER Networks A Classroom Approach	vzzy Logic al o Publishing YEAR OF	, will nd G Hous F PU :awH	ey F ene se. J BI fill	LICATION	
2 3 4 5 Referen S.No. 1 2	S.N.Sivanandar S.Rajasekaran Learning. JS.R.Jang "Ne Jacek.M.Zurada ce Books: AUTHORS, Satish Kumar Zimmermann H	and G.A. uro-Fuzz a "Introd BOOK "Neural 1.S "Fuzz	Vijayalakshmi Pai "Neural Networks, F y and Soft Computing" PHI 2003. uction to Artificial Neural Sytems" Jaio TITLE, EDITION, PUBLISHER Networks A Classroom Approach y Set Theory and its Applications" Kluv	ver Academic	Hous F PU	ey F iene se. U BI Hill	LICATION ers.	
2 3 4 5 Referen S.No. 1 2 3	S.N.Sivanandar S.Rajasekaran Learning. JS.R.Jang "Ne Jacek.M.Zurada ce Books: AUTHORS, Satish Kumar Zimmermann H Davis E.Goldb	and G.A. uro-Fuzz a "Introd BOOK "Neural 1.S "Fuzz erg, "Ge	vijayalakshmi Pai "Neural Networks, F y and Soft Computing" PHI 2003. uction to Artificial Neural Sytems" Jaid TITLE, EDITION, PUBLISHER Networks A Classroom Approach y Set Theory and its Applications" Kluw netic Algorithms: Search, Optimiza	Tata McGi ver Academic tion and Ma	F PU rawF Pub achir	se. J BI Jill blish	CICATION CICATION ers. Learning", Addison	
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2	https://towardsdatascience.com/
3	https://www.geeksforgeeks.org/

		Name	Signature with Date
i.	Faculty	Mrs. K. Haritha Rani	
ii.	Course Coordinator	Mrs. K. Haritha Rani	
iii.	Programme Coordinator	Dr.P.Srinivasulu	

Principal