



DEPARTMENT OF MATHEMATICS

Semester : IX

Integrated M.Sc. Mathematics
Subject : 060090905 Soft Computing

Academic Year : 2019 -20

Teaching Schedule

Course Objectives: To expose the students to soft computing, various types of soft computing techniques, and applications of soft computing.

Course outcomes: Upon completion of the course, students shall be able to

CO1: learn soft computing techniques and their applications

CO2: design and analyse various neural network architectures

CO3: analyse the genetic algorithms and their applications.

CO4: apply fuzzy logic concept along with genetic algorithms to handle different cases.

Unit	Sub Unit	No. of Lect.(s)	Topics	Reference Chapter/ Additional Reading	Teaching Methodology to be used	Active Learning Activities	Evaluation Parameter
Unit 1: Introduction to Soft Computing							
[06]	1.1	1	Introduction, Definitions	CH#1 Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis and Applications [S Rajasekaran]	Chalk & Talk + Audio-Visual	For Slow Learner: At the completion of each topic instant question –answer session is arrange for more clarification and verification. For Active Learner: After the completion of every method students find the real phenomenon problem and solved using that method.	Unit Test-1 Assignment-1
	1.2	1	Historical Development				
	1.3	1	advantages and disadvantages				
	1.4	3	solution of complex real life problems				
Unit 2: Neural Network							
[09]	2.1	1	Fundamentals of Neural Network,	CH# 2 & 3 Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis and Applications [S Rajasekaran]	Chalk & Talk + Audio-Visual	For Slow Learner: At the completion of each topic instant question –answer session is arrange for more clarification and verification. For Active Learner: After the completion of every method	Unit Test-1&2 Assignment-2
	2.2	1	Neural Network Architectures				
	2.3	2	Feedforward Networks				
	2.4	5	Backpropagation Networks				





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						students find the real phenomenon problem and solved using that method. real phenomenon problem and solved using that method.	
Unit 3: Genetic Algorithms:							
[07]	3.1	1	Generation of population,	CH# 8 & 9 Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis and Applications [S Rajasekaran]	Chalk & Talk + Audio-Visual	For Slow Learner: At the completion of each topic instant question –answer session is arrange for more clarification and verification. For Active Learner: After the completion of every method students find the real phenomenon problem and solved using that method. real phenomenon problem and solved using that method.	Unit Test-2 Assignment-3
	3.2	1	Encoding				
	3.3	1	Fitness Function				
	3.4	2	Reproduction, Crossover, Mutation				
	3.5	2	Probability of crossover and Probability of mutation, convergence.				
Unit 4: Hybrid Systems							
[08]	4.1	2	Genetic Algorithm based Back propagation Network	CH# 10-15 Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis and Applications [S Rajasekaran]	Chalk & Talk + Audio-Visual	For Slow Learner: At the completion of each topic instant question –answer session is arrange for more clarification and verification. For Active Learner: After the completion of every method students find the real phenomenon problem and solved using that method. real phenomenon problem and solved using that method.	Internal Examination Assignment-4
	4.2	2	Fuzzy- Back propagation				
	4.3	2	Fuzzy Logic Controlled Genetic Algorithms.				
	4.4	2	Case studies in different Field				





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Text book:

1. S Rajasekaran, S. and VijayalakshmiPai, G.A.: “Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis and Applications”, Prentice Hall of India, 2003.

Reference books:

1. Jang, J-S. R., Sun,C-T, Mizutani, E.: “Neuro–Fuzzy and SoftComputing”, Prentice Hall of India, 2002.
2. Sinha, N.K. and Gupta, M. M. : “Soft Computing and Intelligent Systems - Theory and Applications”, Academic Press, 2000.
3. Tettamanzi, A., Tomassini, M.: “Soft Computing: Integrating Evolutionary, Neural, and Fuzzy Systems”, Springer, 2001.

Course Objectives and Course Outcomes Mapping:

- To expose the students to soft computing: C01, C02
- Expose various types of soft computing techniques: C02, C03
- Applications of soft computing: C04

Course Units and Course Outcomes Mapping:

Unit No.	Unit	Course Outcomes			
		C01	C02	C03	C04
1	Introduction to Soft Computing	✓			
2	Neural Networks		✓		
3	Genetic Algorithms			✓	
4	Hybrid Systems			✓	✓





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Programme Outcomes (PO)

PO1: Knowledge

Provides knowledge about the fundamentals of pure, applied and computing mathematics and its applications to students that creates the opportunities in industries and research centers.

PO2: Core Competence

Creates competency in science and mathematics to formulate, analyses and solve problem and/or also to pursue advanced study or research.

PO3: Breadth

Trains students having good knowledge in unearth core of academia and industry by the roots of mathematics.

PO4: Evaluation

Imparts in students to raise trial and error-based curiosity and problem-solving functionality with research based advanced tutorial for higher level decision makings tools.

Programme Outcomes and Course Outcomes Mapping:

Programme Outcomes	Course Outcomes			
	C01	C02	C03	C04
P01	✓		✓	
P02		✓		✓
P03	✓			✓
P04		✓		✓

