DEPARTMENT OF COMPUTER APPLICATIONS

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

Course Title	Soft Computing		
Course Code	CAS7A2	**No. of Credits**	3
Department	Computer Applications	**Faculty**	Dr. R. Eswari
Pre-requisites Course Code	-		
Course Teacher(s) E-mail	eswari@nitt.edu	**Telephone No.**	0431-2503744
Course Type	Elective course		

COURSE OVERVIEW

This course deals with approximate models and gives solution to complex real-life problems. Unlike hard computing, soft computing is tolerant of imprecision, uncertainty, partial truth, and approximations. It covers fuzzy logic, artificial neural networks, genetic algorithm, neuro-fuzzy and some biological inspired methodologies. On Successful completion of this course, students should be able to solve complex problems using these techniques.

COURSE OBJECTIVES

- To introduce the techniques of soft computing.
- To explain the hybridization of soft computing systems.
- To distinguish between conventional AI and Soft Computing systems in terms of its tolerance to imprecision and uncertainty.

COURSE OUTCOMES

- Implement soft computing algorithms.
- Model global optimization solutions for various real life problems.

Week	No. of Classes	Topic	Mode of Delivery
1	Class-I	Introduction to soft computing	Chalk and Talk , Power Point Presentation
	Class-II	Introduction to fuzzy logic	-do
	Class-III	Fuzzy membership functions	-do
2	Class-I	Fuzzy operations	-do

	Class-II	Fuzzy relations	-do
	Class-III	Fuzzy implications and inferences	-do
3	Class-I	Defuzzification techniques	-do
	Class-II	Fuzzy logic controller	-do
	Class-III	Fuzzy logic controller	-do
4	Class-I	Introduction to artificial neural network	-do
	Class-II	ANN architectures	-do
	Class-III	Training ANNs	-do
5	Class-I	Perceptron learning, supervised hebbian learning	-do
	Class-II	Back propagation, associative learning	-do
	Class-III	Hopfield network	-do
6	Class-I	Concept of genetic algorithm	-do
	Class-II	GA operator encoding schemes	-do
	Class-III	GA operator selection	-do
7	Class-I	GA cross over techniques	-do
	Class-II	GA cross over techniques	-do
	Class-III	GA operator mutation and other	-do
8	Class-I	Neurofuzzy and soft computing	-do
	Class-II	Hybrid learning algorithms	-do
	Class-III	ANFIS and RBFN	-do

9	Class-I	Coactive neuro fuzzy modelling	-do
	Class-II	Neuro functions for adaptive networks	-do
	Class-III	Hybridization of other techniques	-do
10	Class-I	Introduction to swarm intelligence and key principles	-do
	Class-II	Examples	-do
	Class-III	Ant systems	-do
11	Class-I	PSO	-do
	Class-II	Applications	-do
	Class-III	Soft computing tools	-do

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Test 1	4th week of August	1 Hr	15
2	Test 2	3rd week of october	1 Hr	15
3	Problem Solving	1st week of Nov.	10 days	20
4	End Semester Exam	At the end of course	3 hrs	50

ESSENTIAL READINGS

1. J.S.R.Jang, C.T.Sun and E.Mizutani,Neuro-Fuzzy and Soft Computing, PHI,2004
2. J. Freeman and D. Skapura,Neural Networks: Algorithms, Applications, and Programming Techniques, Addison-Wesley,1991
3. G. J. Klir, and B. Yuan,Fuzzy Sets and Fuzzy Logic: Theory and Applications, Prentice-Hall,1995
4. S. Rajasekaran and G.A.V.Pai,Neural Networks, Fuzzy Logic and Genetic Algorithms, PHI,2003
5. KennedyJ. And Eberhart R. C. with Y. Shi, "Swarm Intelligence", Morgan Kaufmann Publisher, 2001.

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)
- The students through the class representative may give their feedback at any time to the course faculty which will be duly addressed.   - The students may also give their feedback during Class Committee meeting.
COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)
Plagiarism The students are expected to come out with their original solution for problems given as assignment, and tests/examinations.   **Attendance** 100% is a must. However, relaxation upto 25% will be given for leave on emergency requirements (medical, death, etc.) and representing institute events.
ADDITIONAL COURSE INFORMATION
The students can get their doubts clarified at any time with their faculty member with prior appointment.
FOR SENATE'S CONSIDERATION

Dr.R.Eswari
Course Faculty

(Dr.S.Sangeetha)
Class Committee Chairperson

(Dr.S.R.Balasundaram)
HoD