SOFT COMPUTING LABORATORY

II Semester: **CSE**

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
BCSB19	Core	0	0	4	2	30	70	100
Contact Classes: Nil	Total Tutorials: Nil	Total Practical Classes: 36				Total Classes: 36		

OBJECTIVES:

The course should enable the students to:

I. Understand Fuzzy concepts
II. Learn neural networks with back propagation and without preparation
III. Learn the operators of genetic algorithms
IV. Practice on crisp partitions

LIST OF EXPERIMENTS

Week-1	**PERCEPTRON**

Create a perceptron with appropriate number of inputs and outputs. Train it using fixed increment learning algorithm until no change in weights is required. Output the final weights

Week-2	**ARTIFICIAL NEAURAL NETWORKS**

Write a program to implement artificial neural network without back propagation.
Write a program to implement artificial neural network with back propagation.

Week-3	**FUZZY SETS**

Implement Union, Intersection, Complement and Difference operations on fuzzy sets. Also create fuzzy relation by Cartesian product of any two fuzzy sets and perform max-min composition on any two fuzzy relations.

Week-4	**GENETIC ALGORITHMS**

Implement travelling sales person problem (TSP) using genetic algorithms.

Week-5	**COVARIANCE**

Plot the correlation plot on dataset and visualize giving an overview of relationships among data on soya bins data. Analysis of covariance: variance (ANOVA), if data have categorical variables on iris data.

Week-6	**DATA FITTING BY REGRESSION**

Implement linear regression and multi-regression for a set of data points.

Week-7	**CRISP MODEL**

Implement crisp partitions for real-life iris dataset.

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COURSE OUTCOMES(COs):

CO 1: Explore methods that implements neural network techniques.
CO 2: Practice the fuzzy set relations using different operations.
CO 3: Design Regression techniques for a set of data points.
CO 4: Capture an appropriate classification model for analytical tasks.
CO 5: Implement best practices and techniques for computing efficiently.

COURSE LEARNING OUTCOMES(CLOs):

1. Demonstrate the Conceptual model of Increment learning algorithm.
2. Identify and understand the methods used in neural networks.
3. Analyze and understand the operations on fuzzy sets
4. Creation of Fuzzy relation by Cartesian product and their implementation on fuzzy sets
5. Explore the applications of Genetic algorithms.
6. Analyze and understand a basic statistics approach to analyze quantitative data.
7. Demonstrate Crisp partition and their modeling techniques
8. Analyze delta rule which are required for strengthening weights between neuron networks
9. Understand Illustrate the use of logic gates and their modeling techniques.
10. Identify and analyze appropriate classification techniques for analytical task.

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Week-8	**PERCEPTRON RULE**
Write a program to implement Hebb‟s rule Write a program to implement Delta rule.	
Week-9	**LOGIC GATES**
Write a program to implement logic gates.	

Week-10	CLASSIFICATION
Implement SVM classification by Fuzzy concepts.	
Reference Books:	
D.K Prathikar, “Soft Computing”, Narosa Publishing House, New Delhi, 2008.	
Web References:	
1. https://ldrp.ac.in/images/syllabus/BE-Computer/802-3%20soft%20computing.pdfhttp://itmgoi.in/download/CSE%20&%20IT/Soft%20Computing%20IT%20(IT-802).pdf 2. http://mirlab.org/jang/book/	
SOFTWARE AND HARDWARE REQUIREMENTS FOR 18 STUDENTS: **SOFTWARE:** Python **HARDWARE:** 18 numbers of Intel Desktop Computers with 4 GB RAM	