Bishop, C. ,M.	Pattern Recognition and Machine Learning		Springer
Yegnanarayana, B.	Artificial Neural Networks		PHI Learning Pvt. Ltd
Golub, G.,H., and VanLoan,C.,F.	Matrix Computations		JHU Press

Soft Computing
Code: PCCAIML603 & PCCAIML693
Contacts: 3L + 4P

Name of the Course:	**Soft Computing**
Course Code: **PCCAIML603 & PCCAIML693**	Semester: VI
Duration:6 months	Maximum Marks: 100
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester exam: 15
Tutorial: NIL	Assignment and Quiz : 10 marks
	Attendance: 5 marks
Practical: 4 hrs./week	End Semester Exam: 70 Marks
	Practical Sessional internal continuous evaluation:40
	Practical Sessional external examination: 60
Credit Points:	3 + 2

Unit	Content	Hrs/Unit	Marks/Unit
1	Introduction: Introduction to soft computing; introduction to fuzzy sets and fuzzy logic systems; introduction to biological and artificial neural network; introduction to Genetic Algorithm	8	

2	Fuzzy sets and Fuzzy logic systems: Classical Sets and Fuzzy Sets and Fuzzy relations : Operations on Classical sets, properties of classical sets, Fuzzy set operations, properties of fuzzy sets, cardinality, operations, and properties of fuzzy relations. Membership functions : Features of membership functions, standard forms and boundaries, different fuzzification methods. Fuzzy to Crisp conversions: Lambda Cuts for fuzzy sets, fuzzy Relations, Defuzzification methods. Classical Logic and Fuzzy Logic: Classical predicate logic, Fuzzy Logic, Approximate reasoning and Fuzzy Implication Fuzzy Rule based Systems: Linguistic Hedges, Fuzzy Rule based system – Aggregation of fuzzy Rules, Fuzzy Inference System- Mamdani Fuzzy Models – Sugeno Fuzzy Models. Applications of Fuzzy Logic: How Fuzzy Logic is applied in Home Appliances, General Fuzzy Logic controllers, Basic Medical Diagnostic systems and Weather forecasting	10	

3	Neural Network Introduction to Neural Networks: Advent of Modern Neuroscience, Classical AI and Neural Networks, Biological Neurons and Artificial neural network; model of artificial neuron. Learning Methods : Hebbian, competitive, Boltzman etc., Neural Network models: Perceptron, Adaline andMadaline networks; single layer network; Back- propagation and multi layer networks. Competitive learning networks: Kohonen self organizing networks, Hebbian learning; Hopfield Networks. Neuo-Fuzzy modelling:Applications of Neural Networks: Pattern Recognition and classification	10	
4.	Genetic Algorithms: Simple GA, crossover and mutation, Multi-objective Genetic Algorithm (MOGA). Applications of Genetic Algorithm: geneticalgorithms in search and optimization, GA based clustering Algorithm, Image processing and pattern Recognition	10	
5	**PSO:**Other Soft Computing techniques: Simulated Annealing, Tabu search, Ant colony optimization (ACO), Particle Swarm Optimization (PSO).	4	

Practical:

Skills to be developed:

1. Able to apply Soft Computing techniques to solve a number of real life problems.

Assignments: : Assignment from theory

List of Books

Text Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Timothy J. Ross, JohnWiley and Sons	Fuzzy logic with engineering applications		
S. Rajasekaran andG.A.V.Pai	Neural Networks, Fuzzy Logic and Genetic Algorithms		PHI
S N Sivanandam, S.Sumathi, John	Principles of Soft Computing		
Reference Books:			
George J. Klir and BoYuan	Fuzzy Sets and Fuzzy Logic: Theory and Applications		Prentice Hall
Simon Haykin	Neural Networks: A Comprehensive Foundation		Prentice Hall.

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	**ALL**	**10**	**10**	**5**	**3**	**15**	**70**
B	**All**						
c	**All**			**5**	**3**	**45**	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objectivepart.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to be set	Question to be answered
A	**ALL**	**1**	**10**	**10**
B	**ALL**	**5**	**5**	**3**
C	**ALL**	**15**	**5**	**3**

Examination Scheme for Practical Sessional examination:		
Practical Internal Sessional Continuous Evaluation		
Internal Examination:		
Continuous evaluation		**40**
External Examination: Examiner-		
Signed Lab Assignments	**10**	
On Spot Experiment	**40**	
Viva voce	**10**	**60**

Name of the Course:	**Computer Networks**		
Course Code: PCC-CS602	Semester: VI		
Duration:6 months	Maximum Marks:100		
Teaching Scheme		**Examination Scheme**	
Theory:3 hrs./week		Mid Semester exam: 15	
Tutorial: NIL		Assignment and Quiz: 10 marks	
		Attendance: 5 marks	
Practical: hrs./week		End Semester Exam:70 Marks	
Credit Points:	3		
Objective:			
1	To develop an understanding of modern network architectures from a design and performance perspective.		
2	To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs).		
3	To provide an opportunity to do network programming		
4	To provide a WLAN measurement ideas.		
Unit	Content	Hrs/Unit	Marks/Unit