Course code	Course Name	L-T-P - Credits	Year of Introduction
EE368	SOFT COMPUTING	3-0-0-3	2016

Prerequisite: Nil

Course Objectives

- To provide the students with the concepts of soft computing techniques such as neural networks, fuzzy systems, genetic algorithms

Syllabus

Introduction to Soft Computing and Neural Networks , Fuzzy Sets and Fuzzy Logic: Fuzzy Sets, Neuro-Fuzzy Modelling , Machine Learning , Machine Learning Approach to Knowledge Acquisition

Expected outcome.

The students will be able to get an idea on :

i. Artificial Intelligence, Various types of production systems, characteristics of production systems.
ii. Neural Networks, architecture, functions and various algorithms involved.
iii. Fuzzy Logic, Various fuzzy systems and their functions.
iv. Genetic algorithms, its applications and advances
v. The unified and exact mathematical basis as well as the general principles of various soft computing techniques.

Text Book:

1. Digital Neural Network -S.Y Kung , Prentice-Hall of India
2. James A. Freeman and David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques", Pearson Edn.,
3. Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, "Neuro-Fuzzy and Soft Computing", Prentice-Hall of India,

References:

1. Amit Konar, "Artificial Intelligence and Soft Computing", First Edition,CRC Press, 2000.
2. David E. Goldberg, Genetic Algorithms in Search, Optimization and Machine Learning", Addison Wesley
3. George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications", Prentice Hall
4. Mitchell Melanie, "An Introduction to Genetic Algorithm", Prentice Hall, 1998.
5. Simon Haykin, "Neural Networks: A Comprehensive Foundation", Prentice Hall,

Course Plan

Module	Contents	Hours	Sem. Exam Marks
I	Introduction To Soft Computing And Neural Networks : Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence - Adaptive Networks – Feed forward Networks – Supervised Learning	7	15%
II	Neural Networks – Radia Basis Function Networks - Reinforcement Learning – Unsupervised Learning Neural Networks – Adaptive Resonance architectures. Fuzzy Sets And Fuzzy Logic: Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations - Fuzzy Rules and Fuzzy Reasoning	7	15%
FIRST INTERNAL EXAMINATION			
III	Fuzzy Inference Systems – Fuzzy Logic – Fuzzy Expert Systems – Fuzzy Decision Making Neuro-Fuzzy Modeling : Adaptive Neuro-Fuzzy Inference Systems – Coactive Neuro-Fuzzy Modeling – Classification and Regression Trees	7	15%

IV	Data Clustering Algorithms – Rulebase Structure Identification Neuro-Fuzzy Control.	7	15%
SECOND INTERNAL EXAMINATION			
V	Machine Learning : Machine Learning Techniques – Machine Learning Using Neural Nets – Genetic Algorithms (GA)	7	20%
VI	Applications of GA in Machine Learning - Machine Learning Approach to Knowledge Acquisition. Support Vector Machines for Learning – Linear Learning Machines – Support Vector Classification – Support Vector Regression - Applications.	7	20%
END SEMESTER EXAM			

QUESTION PAPER PATTERN:

Maximum Marks: 100 Exam Duration: 3Hourrs.

Part A: 8 compulsory questions.

One question from each module of Modules I - IV; and two each from Module V & VI.

Student has to answer all questions. (8 x5)=40

Part B: 3 questions uniformly covering Modules I & II. Student has to answer any 2 from the 3 questions: (2 x 10) =20. Each question can have maximum of 4 sub questions (a,b,c,d), if needed.

Part C: 3 questions uniformly covering Modules III & IV. Student has to answer any 2 from the 3 questions: (2 x 10) =20. Each question can have maximum of 4 sub questions (a,b,c,d), if needed.

Part D: 3 questions uniformly covering Modules V & VI. Student has to answer any 2 from the 3 questions: (2 x 10) =20. Each question can have maximum of 4 sub questions (a,b,c,d), if needed.