

Course code	Course Name	L-T-P - Credits	Year of Introduction
EE368	SOFT COMPUTING	3-0-0-3	2016
<b>Prerequisite: Nil</b>			
<b>Course Objectives</b>			
<ul style="list-style-type: none"> <li>To provide the students with the concepts of soft computing techniques such as neural networks, fuzzy systems, genetic algorithms</li> </ul>			
<b>Syllabus</b>			
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			
<b>Expected outcome.</b>			
The students will be able to get an idea on :			
<ol style="list-style-type: none"> <li>Artificial Intelligence, Various types of production systems, characteristics of production systems.</li> <li>Neural Networks, architecture, functions and various algorithms involved.</li> <li>Fuzzy Logic, Various fuzzy systems and their functions.</li> <li>Genetic algorithms, its applications and advances</li> <li>The unified and exact mathematical basis as well as the general principles of various soft computing techniques.</li> </ol>			
<b>Text Book:</b>			
<ol style="list-style-type: none"> <li>Digital Neural Network -S.Y Kung , Prentice-Hall of India</li> <li>James A. Freeman and David M. Skapura, “Neural Networks Algorithms, Applications, and Programming Techniques”, Pearson Edn.,</li> <li>Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, “Neuro-Fuzzy and Soft Computing”, Prentice-Hall of India,</li> </ol>			
<b>References:</b>			
<ol style="list-style-type: none"> <li>Amit Konar, “Artificial Intelligence and Soft Computing”, First Edition,CRC Press, 2000.</li> <li>David E. Goldberg, Genetic Algorithms in Search, Optimization and Machine Learning”, Addison Wesley</li> <li>George J. Klir and Bo Yuan, “Fuzzy Sets and Fuzzy Logic-Theory and Applications”, Prentice Hall</li> <li>Mitchell Melanie, “An Introduction to Genetic Algorithm”, Prentice Hall, 1998.</li> <li>Simon Haykin, “Neural Networks: A Comprehensive Foundation”, Prentice Hall,</li> </ol>			
<b>Course Plan</b>			
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%
<b>FIRST INTERNAL EXAMINATION</b>			
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%

<b>IV</b>	Data Clustering Algorithms – Rulebase Structure Identification Neuro-Fuzzy Control.	7	15%
<b>SECOND INTERNAL EXAMINATION</b>			
<b>V</b>	Machine Learning : Machine Learning Techniques – Machine Learning Using Neural Nets – Genetic Algorithms (GA)	7	20%
<b>VI</b>	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%
<b>END SEMESTER EXAM</b>			

**QUESTION PAPER PATTERN:**

Maximum Marks: 100

Exam Duration: 3Hours.

**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 x 5)=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.