MCA 506 E
SOFT COMPUTING

Module-I (10 hours)
Introduction to intelligent systems and soft computing: Introduction, Intelligent systems, Knowledge-based systems, Knowledge representation and processing, soft computing.
Fundamentals of fuzzy logic systems: Introduction, background, fuzzy sets, generalized fuzzy operations, implication, definitions, fuzziness and fuzzy resolution, fuzzy relations

Module-II (10 hours)
Composition and inference, considerations of fuzzy decision making. Fundamentals of artificial neural networks: introduction, learning and acquisition of knowledge, features of artificial neural networks, fundamentals of connectionist modeling. Classes of neural networks: introduction, multilayer perceptron, radial basis function networks

Module-III (10 hours)
Kohonen's self-organizing network, Hopfield network, industrial and commercial applications of ANN. Neuro-fuzzy systems: introduction, background, architectures of neuro-fuzzy systems, construction of Neuro-fuzzy systems. Evolutionary computing: introduction, overview

Module-IV (10 hours)
Genetic algorithms and optimization, the schema theorem, genetic algorithm operators, integration of genetic algorithms with neural networks, integration of genetic algorithms with fuzzy logic, known issues in GAs, population-based incremental learning, evolutionary strategies, ES applications.

Module V:(6 hours)(as per choice of faculty)
(Portion covered can be tested through Internal evaluation only not to be included inUniversity examination.)

Text Books:
1. Fakhreddine O. **Karray**, Clarence **De Silva**, "*Soft Computing and Intelligent Systems Design: Theory, Tools and Applications*", Pearson Education, New Delhi.
   Chapters: 1, 2, 4, 5, 7 and 8.
2. Jyh-Shing Roger **Jang**, Chuen-Tsai **Sun**, Eiji **Mizutani**, "*Neuro-Fuzzy and Soft Computing: A Computational Approach to Learning and Machine Intelligence*", 1996, PHI Learning Pvt. Ltd. New Delhi.

Reference Books:
1. S. N. **Sivanadam**, S. N. **Deepa**, "*Principles of Soft Computing*", First Edition, 2008, Wiley India Pvt. Ltd. New Delhi.
2. *Frank **Hoffmann**, M. **Köppen**, F. **Klawonn**, R. **Roy**, "Soft Computing:* Methodologies and Applications", 2006, Springer, New Delhi.
3. D. K. **Prathihar**, "*Soft Computing*", 2007, Narosa Publication, New Delhi.
4. A. K. **Srivastava**, "*Soft Computing*", 2009, Morgan & Claypool / Narosa, New Delhi.
5. N. K. **Sinha**, "*Soft Computing and Intelligent Systems: Theory and Applications*", 2009, Elsevier India Pvt.   Ltd, New Delhi.