23CS31E2 - SOFT COMPUTING

Course Category:	Professional Elective - I	Credits:	3
Course Type:	Theory	Lecture-Tutorial-Practical:	3-0-0
Prerequisite:	• Knowledge in Soft Computing	Sessional Evaluation: Univ. Exam Evaluation: Total Marks:	30 70 100

Course Objectives:	**Students undergoing this course are expected:**
	• Familiarize with soft computing concepts • Introduce and use the idea of fuzzy logic and use of heuristics based on human experience • Familiarize the Neuro-Fuzzy modelling using Classification and Clustering techniques • Learn the concepts of Genetic algorithm and its applications • Acquire the knowledge of Rough Sets

	Upon successful completion of the course, the students will be able to:	
Course Outcomes:	CO1	Identify the difference between Conventional Artificial Intelligence to Computational Intelligence.
	CO2	Understand fuzzy logic and reasoning to handle and solve engineering problems
	CO3	Apply the Classification techniques on various applications.
	CO4	Perform various operations of genetic algorithms and Rough Sets
	CO5	Know the Genetic Algorithms: Basic Concepts.
Course Content:	**UNIT-I** **Introduction to Soft Computing:** Evolutionary Computing, "Soft" computing versus "Hard" computing, Soft Computing Methods, Recent Trends in Soft Computing, Characteristics of Soft computing, Applications of Soft Computing Techniques **UNIT-II** **Fuzzy Systems**: Fuzzy Sets, Fuzzy Relations, Fuzzy Logic, Fuzzy Rule-Based Systems **UNIT-III** Fuzzy Decision Making, Particle Swarm Optimization **UNIT-IV** **Genetic Algorithms**: Basic Concepts, Basic Operators for Genetic Algorithms, Crossover and Mutation Properties, Genetic Algorithm Cycle, Fitness Function, Applications of Genetic Algorithm. . **UNIT-V** Rough Sets, Rough Sets, Rule Induction, and Discernibility Matrix, Integration of Soft Computing Techniques.

| Text Books & References Books: | **TEXTBOOKS:**
1. Soft Computing – Advances and Applications - Jan 2015 by B.K. Tripathy and J. Anuradha – Cengage Learning
REFERENCE BOOKS:
1. S. N. Sivanandam & S. N. Deepa, ―Principles of Soft Computing‖, 2nd edition, Wiley India, 2008.
2. David E. Goldberg, ―Genetic Algorithms-In Search, optimization and Machine learning‖, Pearson Education.
3. J. S. R. Jang, C.T. Sun and E.Mizutani, ―Neuro-Fuzzy and Soft Computing‖, Pearson Education, 2004 4. G.J. Klir & B. Yuan, ―Fuzzy Sets & Fuzzy Logic‖, PHI, 1995.
5. Melanie Mitchell, ―An Introduction to Genetic Algorithm‖, PHI, 1998.
6. Timothy J. Ross, ―Fuzzy Logic with Engineering Applications‖, McGraw- Hill International editions, 1995 |
| E-Resources: | NPTEL |