Course Type	Course Code	Name of Course	L	T	P	Credit
DE	**NMCD506**	Soft Computing Techniques	3	0	0	3

Course Objective
• To provide exposure to theory application of soft computing techniques in Data Analytics.
Learning Outcomes
• This course will provide the students an exposure about how to use computing techniques in Data Analytics.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1	Fuzzy sets: Membership functions, Basic operations, Fuzzy relations Defuzzification, Fuzzy inference, Fuzzy rule-based system, Numerical examples of Fuzzy rule-based system	12	This unit will help students to understand Fuzzy logics.
2	Genetic Algorithm: Working principle Roulette wheel selection, tournament selection, cross over, mutation, Population, binary encoding and decoding for any optimization problem Multi objective GAs, Concepts on non-domination, Tournament selection, crowding distance operator, Ranking	11	This unit will help students to understand the Application of Genetic algorithm.
3	Rough Sets: Lower and upper approximations, Accuracy of Approximations, Discernibility matrix, Discernibility function, Reduct and core, Rule Generations.	11	This unit will help students to apply the concept of rough sets and will learn to deal with big data
4	Hybridization of soft computing tools like Neuro-fuzzy, Rough fuzzy, Rough-Fuzzy -GA, Ant Colony based optimization	8	Students will be able to apply different soft computing techniques in this unit.
Total		**42**	

Text Books:

1. G.J. Klir and B. Yuan, Fuzzy Sets and Fuzzy Logic: Theory and Applications, Prentice-Hall, 1995.

Reference Books:

1. M. Mitchell, An Introduction to Genetic Algorithms, MIT Press, 2000.
2. R. L. Ha upt and S.E. Haupt, Practical Genetic Al gorithms, John Willey & Sons, 2002.