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Dept. of Computer Science & Engineering, NITTTR-Kolkata

Special Short Term Training Programme (ONLINE / ICT) on

Introduction to Fuzzy and Rough Set Theory and Their Applications
(Program Code: SPL06)

1. **Title of the STTP :** *Introduction to Fuzzy and Rough Set Theory and Their Applications*
2. **Coordinator :** *Dr. Samir Roy, Professor & Head, Dept. of CSE*
3. **Date :** *From 19th To 23rd September, 2022 (1 week)*
4. **Mode :** *Online / ICT*
5. **Target Participants/Groups :** *Any technical teacher with basic knowledge of Mathematics*
6. **Programme Outcome :** *After successful completion of the programme, the participant will be able to*

i) Explain the basic concepts of Fuzzy Set theory and fuzzy logic.
ii) Explain the basic concepts of Rough Set theory.
iii) Apply Fuzzy and Rough set theory in intelligent systems.
iv) Design intelligent systems by incorporating the concepts of Fuzzy and Rough set theory.
v) Develop computational systems using Fuzzy and Rough set theory.

7. **Course Outline**

Fuzzy set theory, Fuzzy Logic and Applications.
Introduction to fuzzy set theory - membership functions, transformations on membership functions, linguistic variables, fuzzy set operations etc. Fuzzy relations and related matters. Concepts of Fuzzy logic - fuzzy truth value, fuzzy proposition, fuzzy logic operations, linguistic variable, fuzzy rules, fuzzy if-then, fuzzy if-then-else, fuzzy reasoning. Fuzzy Inference system and its application to Fuzzy Controllers.

Rough Set Theory and Applications
Vagueness in data, Information Systems, Decision Systems, Indiscernibility, Set approximations - Lower Approximation, Upper Approximation, Boundary Region, Rough Membership, Reduct, Minimal Reduct, Discernibility Matrix, Discernibility Function, Rule Extraction, Data Clustering