



# FUZZY SETS, LOGIC AND SYSTEMS & APPLICATIONS

**PROF. NISHCHAL KUMAR VERMA**

Department of Electrical Engineering  
IIT Kanpur

**TYPE OF COURSE** : Rerun | Elective | UG/PG

**COURSE DURATION** : 12 weeks (24 Jan' 22 - 15 Apr' 22)

**EXAM DATE** : 23 Apr 2022

**INTENDED AUDIENCE** : UG, PG Students, industry professionals, researchers etc.

**COURSE OUTLINE :**

The course is designed to give a solid grounding of fundamental concepts of fuzzy logic and its applications. The level of the course is chosen to be such that all students aspiring to be a part of computational intelligence directly or indirectly in near future should get a foundation of these concepts through this course.

**ABOUT INSTRUCTOR :**

Prof. Nishchal K Verma (SM'13) is teaching in the Department of Electrical Engineering and Inter-disciplinary Program in Cognitive Science, Indian Institute of Technology Kanpur, India. He obtained his PhD in Electrical Engineering from Indian Institute of Technology Delhi, India. He is an awardee of Devendra Shukla Young Faculty Research Fellowship by Indian Institute of Technology Kanpur, India for year 2013-16.

**COURSE PLAN :**

**Week 1:** Introduction and Fuzzy Sets Theory

**Week 2:** Membership Functions

**Week 3:** Set Theoretic Operations

**Week 4:** Fuzzy Arithmetic

**Week 5:** Fuzzy Relations

**Week 6:** Fuzzy Inference Systems I

**Week 7:** Fuzzy Inference Systems II

**Week 8:** Wang and Mendel Model

**Week 9:** TSK Model

**Week 10:** Fuzzifiers and Defuzzifiers

**Week 11:** ANFIS Architecture

**Week 12:** Fuzzy Systems and Machine Learning