Department of Mathematics
Faculty of Mathematics & Computer Science
PhD, Mathematics

Course Code	AM 606
Course Title	Advanced Fuzzy Set Theory
Course Credits	04

Course objectives:

In the subject, higher order fuzzy sets (HFS) are dealt. Further, the mathematics and applications of HFSs are also discussed.

Minimum Pre-requisites:

This course requires the basic understandings of fuzzy set theory.

Course Structure:

Unit-I: Fuzzy set; Intuitionistic fuzzy set; Type 2 fuzzy set; Type n fuzzy set; Set theoretic operations between HFSs; Addition, Subtraction, Multiplication, Division for the HFSs.

Unit-II: Measures of fuzziness, The Extension Principle and Applications; HFS based relations; HFS based functions; Extrema of HFS; Distance and similarity functions for HFSs; Intuitionistic fuzzy continuity; Intuitionistic fuzzy integral; Intuitionistic fuzzy definite integral.

Unit-III: Connection between Probability and Fuzzy set theory; Possibility theory; Applications of higher order fuzzy sets in the field of Machine learning, Decision Making and Data Mining.

Reading suggestions:

- Fuzzy Set Theory and its Applications – Kluwer Academic Publisher –Third Edition by Zimmerman

- Mathematics of Fuzzy Sets: Logic, Topology, and Measure Theory –Springer Science -1999-by Didier Dubious and Henri Parde
- Fuzzy Sets of Higher Type and Higher Order in Fuzzy Modeling –Springer Science -2014-by Witold Pedrycz

Evaluation and weightage:

- 20% for Quiz/Presentation
- 40% for Mid-Term examination
- 40% for End-Term examination