

## **MA-637 FUZZY ALGEBRA (M.Phil./Ph.D.) (Cr. 3)**

1. Introduction

2. The Concept of Fuzziness Examples, Mathematical Modeling, Operations of fuzzy sets, Fuzziness as uncertainty.

### **3. Algebra of Fuzzy Sets**

Boolean Algebra and lattices, Equivalence relations and partitions, Composing mappings, Alpha-cuts, Images of alpha-level sets, Operations on fuzzy sets.

### **4. Fuzzy Relations**

Definition and examples, Binary Fuzzy relations Operations on Fuzzy relations, fuzzy partitions.

### **5. Fuzzy Semigroups**

Fuzzy ideals of semigroups, Fuzzy quasi-ideals, Fuzzy bi-ideals of Semigroups, Characterization of different classes of semigroups by the properties of their fuzzy ideals fuzzy quasi-ideals and fuzzy bi-ideals.

### **6. Fuzzy Rings**

Fuzzy ideals of rings, Prime, semiprime fuzzy ideals, Characterization of rings using the properties of fuzzy ideals.

## **RECOMMENDED BOOKS:**

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|---|--|
| a) Hung T. Nguyen and<br>Elbert A. Walker             | A First course in Fuzzy Logic, Chapman and Hall/CRC<br>1999. |
| b) M. Ganesh,<br>of India, 2006.                      | Introduction to Fuzzy Sets and Fuzzy Logic, Prentice-Hall    |
| c) John N. Mordeson and<br>D.S. Malik,                | Fuzzy Commutative algebra, World Scientific, 1998.           |
| d) John N. Mordeson,,<br>D.S. Malik and Nobuki Kuroki | Fuzzy Semigroups, Springer-Verlage, 2003.                    |