

**MA-639 ALGEBRAIC NUMBER THEORY (M.Phil./Ph.D.) (Cr. 3)**

1. Algebraic Numbers: Algebraic Numbers and Number Fields, Discriminant, Norms and Traces, Algebraic integers and Integral Bases, Factorization and Divisibility, Applications of UFD.
2. Arithmetic's Number Fields: Quadratic Diels, Cyclotomic Fields, Units in Number rings.
3. Ideals Theory: Properties of Ideals, PIDs and UFDs, Dedekind rings, Norms of ideals, Class group and Class Numbers of Quadratic Fields.
4. Valuations: Definitions and First properties of valuations, Valuation rings, DVRs, P-adic valuation.

**RECOMMENDED BOOKS:**

- a) Richard A. Molin, "Algebraic Number Theory", Chapman & Hall, Washington D. C., (2005)
- b) A.N. Parshin and I.R. Shafarevich, "Number Theory I, Fundamental Problems, Ideas and Theories" Springer-Verlag, Berlin Heidelberg, (1995)
- c) G.J. Janusz, "Algebraic Number Fields". Academic Press, New York and London (1973).