

Course Code	Course Title	C	H	I	E	T
17U3MMC5	Groups and Rings	6	6	25	75	100

Learning Objectives

- To enrich the students with the knowledge of Abstract Algebra.
- To have a good foundation in Groups and Rings.

Learning Outcomes

On satisfying the requirement of this course, students will have the knowledge and skills to

- Explain the fundamental concepts of Groups & Rings and their role in modern mathematics and applied contexts.
- Demonstrate accurate and efficient use of advanced algebraic techniques.

Unit I Groups

Definition and examples – Elementary properties of a group – Permutation groups.

Unit II Subgroups

Definition and examples of subgroups – Cyclic groups – Order of an element – Cosets and Lagrange's theorem.

Unit III Normal subgroups and Homomorphisms

Definition and examples of Normal subgroups – Quotient groups – Isomorphism – Homomorphism.

Unit IV Rings

Definition and examples of rings – Elementary properties of rings – Isomorphism – Types of rings – Characteristic of a ring – Sub rings.

Unit V Ideals

Definition and examples of ideals – Quotient rings – Maximal and Prime ideals -Homomorphism of rings – Field of quotients of an integral domain.

Text Book:

1. S. Arumugam and A. ThangapandiIssac, Modern Algebra, 2011, Scitech Publications (India) Pvt. Ltd.

Chapters: 3 (3.1 – 3.2, 3.4 – 3.11), 4 (4.1 – 4.11)

Reference Books:

1. Vijay K. Khanna and S. K. Bhambri, A Course in Abstract Algebra, 3rd Edition, Vikas Publishing House Pvt. Ltd.
2. Surjeet Singh and QuaziZameeruddin, Modern Algebra, 2nd Reprint 2009, Vikas Publishing House Pvt. Ltd.