Module Code: MATH-422
Module Title: **Theory of Modules**
Module Rating: 3 Cr. Hours

Modules

- Definition and examples
- Submodules
- Homomorphisms
- Quotient modules
- Direct sums of modules.
- Finitely generated modules
- Torsion modules
- Free modules
- Basis, rank and endomorphisms of free modules
- Matrices over rings and their connection with the basis of a free module
- A module as the direct sum of a free and a torsion module

Recommended Books

1. J. Rotman, *The Theory of Groups*, 2nd edition, (Allyn and Bacon, London, 1978)
7. J. B. Fraleigh, *A First Course in Abstract Algebra*, 7th edition, (Addison-Weseley Publishing Co., 2003)
2. H. Marshall, *The Theory of Groups*, (Macmillan, 1967).
3. J. A. Gallian, *Contemporary Abstract Algebra*, 4th edition, (Narosa Publisihng House, 1998)
4. J. S. Rose, *A Course on Group Theory*, (Dover Publications, New York, 1994)
5. K. Hoffman, Linear Algebra, 2nd edition, (Prentice Hall, 1971)