Code	Subject Title	Cr. Hrs	Semester
MATH-423	**Theory of Modules**	**3**	**VIII**
Year	Discipline		
4	**Mathematics**		

Objectives:

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:

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