

Advanced Abstract Algebra - Web course

COURSE OUTLINE

Cyclic modules. Simple modules. Semi-simple modules. Schuler's Lemma. Free modules.

Notherian and artinian modules and rings-Hilbert basis theorem. Wedderburn-Artin theorem. Uniform modules, primary modules, and Nother-Lasker theorem.

Smith normal form over a principal ideal domain and rank.

Fundamental structure theorem for finitely generated modules over a principal ideal domain and its applications to finitely generated Abelian groups. Rational canonical form. Generalised Jordan form over any field.

COURSE DETAIL

Module No.	Topic/s	Lectures
1	Cyclic modules. Simple modules. Semi-simple modules. Schuler's Lemma. Free modules.	8
2	Notherian and artinian modules and rings-Hilbert basis theorem. Wedderburn-Artin theorem. Uniform modules, primary modules, and Nother-Lasker theorem.	11
3	Smith normal form over a principal ideal domain and rank.	6
4	Fundamental structure theorem for finitely generated modules over a principal ideal domain and its applications to finitely generated abelian groups. Rational canonical form. Generalised Jordan form over any field.	15



NP-TEL

NPTEL

<http://nptel.iitm.ac.in>

Mathematics

Pre-requisites:

Abstract Algebra

Additional Reading:

1. P.M. Cohn, Algebra, Vols. I, II & III, John Wiley & Sons, 1982, 1989, 1991.
2. N. Jacobson, Structure of Rings, Amer. Math. Soc., 1956
3. J. Lambek, Lectures on Rings and Modules, Blaisdell Waltham, 1966

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References:

1. M. Artin, Algebra, Prentice-Hall of india, 1991.
2. N. Jacobson, Basic Algebra, Vols. I & II, W.H. Freeman, 1980(also published by Hindustan Publishing Company)
3. S. Lang, Algebra, 3rd edition, Addison-Wesley, 1993.
4. I.S. Luther and I.B.S. Passi, Algebra: Vol. II-Rings, Narosa Publishing
5. House (Vol. I-1996, Vol. II-1999)