Algebra II - Web course

COURSE DETAIL

Module No.	Topic/s	Lectures
1	**Advanced Group Theory** Simple groups and solvable groups, nilpotent groups, simpcity of alternatinlig groups, composition series, JordanHolder Theorem.Semidirect products. Free groups, abelian groups.	8
2	**Ring Theory** Rings,Examples (including polynomial rings, formal power series rings, matrix rings and group rings), ideals, prime and maximal ideals, rings of fractions,Chinese Remainder Theorem for pairwise comaximal ideals. Euclidean Domains, Principal Ideal Domains and Unique Factorizations Domains. Polynomial rings over UFD's.	10
3	**Field Theory** Fields, Characteristic and prime subfields, Field extensions, Finite,algebraic and finitely generated field extensions, Classical ruler and compass constructions, Splitting fields and normal extensions, algebraic closures. Finite fields, Cyclotomic fields, Separable and inseparable extensions.	10
4	**Galois Theory** Galois groups, Fundamental Theorem of Galois Theory, Composite extensions, Examples (including cyclotomic extensions and extensions of finite fields). Solvability by radicals, Galois' Theorem on solvability. Cyclic and abelian extensions, transcendental extensions.	12

References:

1. Artin, Algebra, Prentice Hall of India,1994.

2. D.S. Dummit and R. M. Foote, Abstract Algebra, 2nd Ed., John Wiley, 2002.

3. J.A. Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa, 1999.

4. N. Jacobson, Basic Algebra I, 2nd Ed., Hindustan Publishing Co., 1984,

5. S. Lang, Algebra I, III Edition, Addison Wesley, 2005

NPTEL

http://nptel.iitm.ac.in

Mathematics

Pre-requisites:

Basic theory of groups, rings and fields.

Coordinators:

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