

NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Mathematics - NOC:Rings and Modules

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Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Rings
- Lecture 2 - Rings, Subrings
- Lecture 3 - Ring Homomorphism, Ideals
- Lecture 4 - Properties of Ideals
- Lecture 5 - Properties of Ideals (Continued...)
- Lecture 6 - Quotient Ring, Isomorphism Theorem
- Lecture 7 - Isomorphism Theorem, Homomorphism Theorem
- Lecture 8 - Homomorphism Theorem
- Lecture 9 - Integral Domain, Quotient Ring
- Lecture 10 - Quotient Ring
- Lecture 11 - Prime ideals, Maximal ideals
- Lecture 12 - Maximal ideals
- Lecture 13 - Hilbert's Nullstellensatz
- Lecture 14 - Hilbert's Nullstellensatz (Continued...)
- Lecture 15 - Application of Hilbert's Nullstellensatz
- Lecture 16 - Unique Factorization domain
- Lecture 17 - Properties of Unique Factorization domain
- Lecture 18 - Principal ideal domain
- Lecture 19 - Properties of PID and ED
- Lecture 20 - Properties of PID and ED (Continued...)
- Lecture 21 - Prime elements of $\mathbb{Z}[i]$
- Lecture 22 - Prime elements of $\mathbb{Z}[i]$ (Continued...)
- Lecture 23 - Application in $\mathbb{Z}[i]$
- Lecture 24 - Polynomial Rings over UFD
- Lecture 25 - Gauss's Lemma
- Lecture 26 - Polynomial Ring over UFD and Irreducibility Criterion
- Lecture 27 - Irreducibility Criterion
- Lecture 28 - Chinese Remainder Theorem
- Lecture 29 - Nilradical and Jacobson radical

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- Lecture 30 - Examples and Problems
- Lecture 31 - Definition of Modules and Examples
- Lecture 32 - Definition of Modules and Examples (Continued...)
- Lecture 33 - Submodules, direct sum and direct product of modules
- Lecture 34 - Direct sum and direct product of modules, free modules
- Lecture 35 - Finitely generated modules, free modules vs Vector spaces
- Lecture 36 - Free modules vs Vector spaces
- Lecture 37 - Vector spaces vs free modules and Examples
- Lecture 38 - Quotient modules and module homomorphisms
- Lecture 39 - Module homomorphism, Epimorphism theorem
- Lecture 40 - Epimorphism theorem
- Lecture 41 - Maximal submodules, minimal submodules
- Lecture 42 - Freeness of submodules of a free module over a PID
- Lecture 43 - Torsion modules, freeness of torsion-free modules over a PID
- Lecture 44 - Rank of a module, p -submodules over a PID
- Lecture 45 - Structure of a torsion module over a PID
- Lecture 46 - Structure theorem, chain conditions
- Lecture 47 - Artinian modules, Artinian rings
- Lecture 48 - Noetherian modules, Noetherian rings
- Lecture 49 - Ascending chain condition, Noetherian modules
- Lecture 50 - Examples of Noetherian and Artinian modules and rings
- Lecture 51 - Composition series, Modules of finite length
- Lecture 52 - Jordan-Hölder's theorem
- Lecture 53 - Artinian rings
- Lecture 54 - Noetherian rings
- Lecture 55 - Hilbert basis theorem
- Lecture 56 - Cohen's theorem on Noetherianness
- Lecture 57 - Nakayama lemma
- Lecture 58 - Nil and Jacobson radicals in Artinian rings
- Lecture 59 - Structure theorem
- Lecture 60 - Comparison between Artinian and Noetherian rings