NPTEL Video Course - Mathematics - NOC:Introduction to Algebraic Geometry and Commutative Algebra

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Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Motivation for K-algebraic sets
Lecture 2 - Definitions and examples of Affine Algebraic Set
Lecture 3 - Rings and Ideals
Lecture 4 - Operation on Ideals
Lecture 5 - Prime Ideals and Maximal Ideals
Lecture 6 - Krull's Theorem and consequences
Lecture 7 - Module, submodules and quotient modules
Lecture 8 - Algebras and polynomial algebras
Lecture 9 - Universal property of polynomial algebra and examples
Lecture 10 - Finite and Finite type algebras
Lecture 11 - K-Spectrum (K-rational points)
Lecture 12 - Identity theorem for Polynomial functions
Lecture 13 - Basic properties of K-algebraic sets
Lecture 14 - Examples of K-algebraic sets
Lecture 15 - K-Zariski Topology
Lecture 16 - The map V L
Lecture 17 - Noetherian and Artinian Ordered sets
Lecture 18 - Noetherian induction and Transfinite induction
Lecture 19 - Modules with Chain Conditions
Lecture 20 - Properties of Noetherian and Artinian Modules
Lecture 21 - Examples of Artinian and Noetherian Modules
Lecture 22 - Finite modules over Noetherian Rings
Lecture 23 - Hilbertâ s Basis Theorem (HBT)
Lecture 24 - Consequences of HBT
Lecture 25 - Free Modules and rank
Lecture 26 - More on Noetherian and Artinian modules
Lecture 27 - Ring of Fractions (Localization)
Lecture 28 - Nil radical, contraction of ideals
Lecture 29 - Universal property of S -1 A

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Lecture 30 - Ideal structure in S -1 A
Lecture 31 - Consequences of the Correspondence of Ideals
Lecture 32 - Consequences of the Correspondence of Ideals (Continued...)
Lecture 33 - Modules of Fraction and universal properties
Lecture 34 - Exactness of the functor S -1
Lecture 35 - Universal property of Modules of Fractions
Lecture 36 - Further properties of Modules and Module of Fractions
Lecture 37 - Local-Global Principle
Lecture 38 - Consequences of Local-Global Principle
Lecture 39 - Properties of Artinian Rings
Lecture 40 - Krull-Nakayama Lemma
Lecture 41 - Properties of I K and V L maps
Lecture 42 - Hilbertâ  s Nullstelensatz
Lecture 43 - Hilbertâ  s Nullstelensatz (Continued...)
Lecture 44 - Proof of Zariskiâ  s Lemma (HNS 3)
Lecture 45 - Consequences of HNS
Lecture 46 - Consequences of HNS (Continued...)
Lecture 47 - Jacobson Ring and examples
Lecture 48 - Irreducible subsets of Zariski Topology (Finite type K-algebra)
Lecture 49 - Spec functor on Finite type K-algebras
Lecture 50 - Properties of Irreducible topological spaces
Lecture 51 - Zariski Topology on arbitrary commutative rings
Lecture 52 - Spec functor on arbitrary commutative rings
Lecture 53 - Topological properties of Spec A
Lecture 54 - Example to support the term Spectrum
Lecture 55 - Integral Extensions
Lecture 56 - Elementwise characterization of Integral extensions
Lecture 57 - Properties and examples of Integral extensions
Lecture 58 - Prime and Maximal ideals in integral extensions
Lecture 59 - Lying over Theorem
Lecture 60 - Cohen-Siedelberg Theorem
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