

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

NPTEL Video Course - Mathematics - NOC:Introduction to Algebraic Topology - Part I

Subject Co-ordinator - Prof. Anant R. Shastri

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Basic Problem in Topology  
Lecture 2 - Concept of homotopy  
Lecture 3 - Bird's eye-view of the course  
Lecture 4 - Path Homotopy  
Lecture 5 - Composition of paths  
Lecture 6 - Fundamental group  $\pi_1$   
Lecture 7 - Computation of Fund. Group of a circle  
Lecture 8 - Computation (Continued...)  
Lecture 9 - Computation concluded  
Lecture 10 - Van-Kampen's Theorem  
Lecture 11 - Function Spaces  
Lecture 12 - Quotient Maps  
Lecture 13 - Group Actions  
Lecture 14 - Examples of Group Actions  
Lecture 15 - Assorted Results on Quotient Spaces  
Lecture 16 - Quotient Constructions Typical to Alg. Top  
Lecture 17 - Quotient Constructions (Continued...)  
Lecture 18 - Relative Homotopy  
Lecture 19 - Construction of a typical SDR  
Lecture 20 - Generalized construction of SDRs  
Lecture 21 - A theoretical application  
Lecture 22 - The Harvest  
Lecture 23 - NDR pairs  
Lecture 24 - General Remarks  
Lecture 25 - Basics of Geometry  
Lecture 26 - Abstract Simplicial Complex  
Lecture 27 - Geometric Realization  
Lecture 28 - Topology on  $|K|$   
Lecture 29 - Simplicial maps

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

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- Lecture 30 - Polyhedrons
- Lecture 31 - Point Set topological Aspects
- Lecture 32 - Barycentric Subdivision
- Lecture 33 - Finer Subdivisions
- Lecture 34 - Simplicial Approximation
- Lecture 35 - Sperner Lemma
- Lecture 36 - Invariance of domain
- Lecture 37 - Proof of controlled homotopy
- Lecture 38 - Links and Stars
- Lecture 39 - Homotopical Aspects of Simplicial Complexes
- Lecture 40 - Homotopical Aspects
- Lecture 41 - Covering Spaces and Fund. Groups
- Lecture 42 - Lifting Properties
- Lecture 43 - Homotopy Lifting
- Lecture 44 - Relation with the fund. Group
- Lecture 45 - Regular covering
- Lecture 46 - Lifting Problem
- Lecture 47 - Classification of Coverings
- Lecture 48 - Classification
- Lecture 49 - Existence of Simply connected coverings
- Lecture 50 - Construction of Simply connected covering
- Lecture 51 - Properties Shared by total space and base
- Lecture 52 - Examples
- Lecture 53 - G-coverings
- Lecture 54 - Pull-backs
- Lecture 55 - Classification of G-coverings
- Lecture 56 - Proof of classification
- Lecture 57 - Pushouts and Free products
- Lecture 58 - Existence of Free Products, pushouts
- Lecture 59 - Free Products and free groups
- Lecture 60 - Seifert-Van Kampen Theorems
- Lecture 61 - Applications
- Lecture 62 - Applications (Continued...)