

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

NPTEL Video Course - Multi Disciplinary - NOC:Introduction to Evolutionary Dynamics

Subject Co-ordinator - Prof. Supreet Saini

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Story of proposal of the theory of natural selection
- Lecture 2 - Natural Selection; Patrick Matthew. History of life on earth
- Lecture 3 - Where did life come from ?
- Lecture 4 - Elements of theory of natural selection
- Lecture 5 - Limitations of Darwins proposal of theory of natural selection
- Lecture 6 - Natural selection in action in ecology
- Lecture 7 - Central Dogma of Molecular Biology
- Lecture 8 - Gene expression in biology
- Lecture 9 - Numbers in E. coli
- Lecture 10 - Growth and evolution in microbial populations
- Lecture 11 - Mutations and errors in DNA replication
- Lecture 12 - How does E. coli divide ?
- Lecture 13 - How does evolution take place in sexually reproducing organisms ?
- Lecture 14 - Growth in batch culture
- Lecture 15 - How to define fitness in a batch culture ?
- Lecture 16 - Model for growth in exponential growth
- Lecture 17 - Logistic model for growth
- Lecture 18 - Growth in a chemostat
- Lecture 19 - Modeling genotype competition in a chemostat
- Lecture 20 - Mutations and their selection coefficients
- Lecture 21 - Distribution of fitness effects (DFE)
- Lecture 22 - Sequence Space and Fitness Landscape
- Lecture 23 - Epistasis and structure of landscape
- Lecture 24 - Epistasis and structure of landscape
- Lecture 25 - Landscape of antibiotic resistance
- Lecture 26 - IPsec and Virtual Private Networks (VPNs) for Network-Layer Security - Part 1
- Lecture 27 - IPsec and Virtual Private Networks (VPNs) for Network-Layer Security - Part 2
- Lecture 28 - IPsec and Virtual Private Networks (VPNs) for Network-Layer Security - Part 3
- Lecture 29 - Securing Wireless LANs - Part 1

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- Lecture 30 - Securing Wireless LANs - Part 2
- Lecture 31 - Marbles in a jar continued
- Lecture 32 - Moran Process
- Lecture 33 - Transition probability in Moran process
- Lecture 34 - Fixation probability
- Lecture 35 - Fixation probability of a neutral mutation
- Lecture 36 - Fixation probability of a beneficial mutation
- Lecture 37 - Fixation probability of a beneficial mutation (Continued...)
- Lecture 38 - Fixation probability of a beneficial mutation (Continued...)
- Lecture 39 - Time of occurrence of mutations
- Lecture 40 - Graphical representation of evolving populations
- Lecture 41 - Time of fixation of mutations
- Lecture 42 - Estimating  $t_{wait}$
- Lecture 43 - Traveling wave model of microbial evolution
- Lecture 44 - Deriving traveling wave model equations
- Lecture 45 -  $dN/dS$
- Lecture 46 -  $dN/dS$  (Continued...), and how to do an evolution experiment in lab ?
- Lecture 47 - Serial Subculture Experiment
- Lecture 48 - Evolution in Chemostat and Mutation Accumulation Experiment
- Lecture 49 - Megaplate Experiment
- Lecture 50 - Long Term Evolution Experiment (LTEE)
- Lecture 51 - Fitness trajectory with number of generations
- Lecture 52 - Second order selection - mutation rate
- Lecture 53 - Do fitness landscapes have a peak ?
- Lecture 54 - Do fitness landscapes have a peak ? (Continued...)
- Lecture 55 - Metabolic innovation in a lab evolution experiment ?
- Lecture 56 - Selection vs. Drift
- Lecture 57 - Historical Contingency in evolution
- Lecture 58 - Unicellularity to Multicellularity
- Lecture 59 - Adaptive diversification in microbial populations
- Lecture 60 - Synonymous mutations have fitness effects. Mutation Accumulation Experiments