

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

NPTEL Video Course - Mechanical Engineering - NOC:Engine System and Performance

Subject Co-ordinator - Prof. Pranab K. Mondal

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction to Engine Systems and Its Types: A Focus on Ignition System

Lecture 2 - A Focus on Lubrication and Cooling Systems

Lecture 3 - Engine Classifications and Nomenclature

Lecture 4 - Analysis of Basic Cycles

Lecture 5 - Description of Engine Components

Lecture 6 - Design and Constructional Features of Engine Hardware

Lecture 7 - Shape and Material of Engine Components

Lecture 8 - Concept of Hybrid Engines and Working Principle

Lecture 9 - Types of Hybrid Arrangements

Lecture 10 - Description of Energy Transfer Mechanism

Lecture 11 - Components Involved: Energy Transfer

Lecture 12 - Components Involved and Numerical Problems: Energy Transfer

Lecture 13 - Introduction to Electronic Control Unit (ECU) and its functions

Lecture 14 - Description of Electronic Control Unit (ECU) and types of control system: Open-loop and Close loop

Lecture 15 - Memory-based and Adaptive-based control systems

Lecture 16 - Control system layout and types of sensors: Coolant temperature sensor and Crankshaft position sensor

Lecture 17 - Manifold Absolute Pressure sensor (MAP) and Throttle Position Sensor (TPS)

Lecture 18 - Actuators in control system: Solenoids, Piezoelectric and Stepper motor

Lecture 19 - Key elements of ECU: Microprocessor and Memory chips

Lecture 20 - Introduction to electronic devices and circuits

Lecture 21 - Introduction to Transistors

Lecture 22 - Introduction to Digital circuits

Lecture 23 - Functional layout of Electronic Control Unit (ECU)

Lecture 24 - Electronic ignition system

Lecture 25 - Electronic Fuel-Injection System: Injection schemes

Lecture 26 - An overview of injection duration calculation

Lecture 27 - Modes for fuel control, Integrated engine control system

Lecture 28 - Introduction to Engine performance and its measurement

Lecture 29 - Measurement of fuel flow rate, air flow rate and needle lift in a CI engine

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- Lecture 30 - Measurement of indicated work, Numerical problem
- Lecture 31 - Measurement of torque: Power output from engine, Numerical problem
- Lecture 32 - Measurement of volumetric efficiency
- Lecture 33 - SI engine performance curves and Performance characteristics
- Lecture 34 - Performance map, Analytical method of performance estimation
- Lecture 35 - CI engine performance, factors affecting engine performance
- Lecture 36 - Introduction to Superchargers
- Lecture 37 - Performance Map of Superchargers and Numerical Problems
- Lecture 38 - Introduction to Turbocharger and Phenomenon of Turbo-lag in Turbochargers
- Lecture 39 - Introduction to Variable Geometry Turbine
- Lecture 40 - Numerical Problems on Turbocharger
- Lecture 41 - Engine heat balance
- Lecture 42 - Measurement of heat losses in engines and Numerical problem
- Lecture 43 - Speed control of IC engines
- Lecture 44 - Mechanical and Electronic governor
- Lecture 45 - Trend of recent technologies to achieve better performance and reduce pollution