NPTEL Video Course - Electrical Engineering - NOC:Design of Electric Motors

Subject Co-ordinator - Dr. Prathap Reddy

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - History Prospect of Electrical Machines
Lecture 2 - Electric Fields
Lecture 3 - Magnetic Fields - 1
Lecture 4 - Magnetic Fields - 2
Lecture 5 - Electric and Magnetic Circuits Interface
Lecture 6 - Magnetic Materials and Concepts of BH Curves
Lecture 7 - Analysis of Magnetic Circuits With and Without Air Gaps
Lecture 8 - Example Problems of Magnetic Circuits
Lecture 9 - Magnetic Circuits with Multiple Windings and Permanent Magnets
Lecture 10 - Force Equations in Electromechanical Systems - 1
Lecture 11 - Force Equations in Electromechanical Systems - 2
Lecture 12 - Design of Electromagnetic Systems
Lecture 13 - Realization of Electrical Machines - 1
Lecture 14 - Realization of Electrical Machines - 2
Lecture 15 - Magnetic Fields in DC Machines - 1
Lecture 16 - Magnetic Fields in AC Machines - 1
Lecture 17 - Magnetic Fields in AC Machines - 2
Lecture 18 - Magnetic Fields in AC Machines - 3
Lecture 19 - MMFDistribution ofAC Machines
Lecture 20 - Basics of Electrical Machine Windings
Lecture 21 - Stator winding design-single layer winding
Lecture 22 - Stator winding design-double layer winding
Lecture 23 - Stator Winding Design-Fractional Slot Double Layer Winding
Lecture 24 - Variable Pole Machine Stator Winding Design (Pole-Phase Modulation) - 1
Lecture 25 - Variable Pole Machine Stator Winding Design (Pole-Phase Modulation) - 2
Lecture 26 - Importance of Motor Design and Standards of Electric Motors
Lecture 27 - Electric Machine Sizing Equations-Output Power and Volume (D2L) Product Equation
Lecture 28 - Lab Session on Re-winding of Induction Motor (Example: Double Layer Winding)
Lecture 29 - The Figure of Merits for Electric Motors and Aspect Ratio to Decouple the D2L Product

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Lecture 30 - Electric Machine Sizing Equations-Output Power Equation in terms of D3L Product - 1
Lecture 31 - Electric Machine Sizing Equations-Output Power Equation in terms of D3L Product - 2
Lecture 32 - Analysis of Copper Function and Output Function w r t the Electric Machine D3L Product Eqn
Lecture 33 - Example Problems on Output Power Equation in terms of D3L Product
Lecture 34 - Electric Machine Sizing Equations-Output Power Equation in terms of D the power 2.5 L Product
Lecture 35 - Design Procedure of an Electric Machine
Lecture 36 - Name Plate Details and Datasheets of Induction Motor
Lecture 37 - Design of Induction Machine- Stator Design - 1 (Stator Core design)
Lecture 38 - Design of Induction Machine- Stator Design - 2 (Stator Winding Design)
Lecture 39 - Design of Induction Machine- Stator Design - 3 (Stator Slot Geometry)
Lecture 40 - Design of Induction Machine- Rotor Design - 1 (Rotor Slots Selection)
Lecture 41 - Design of Induction Machine- Rotor Design - 2 (Rotor MMF and Bar Currents)
Lecture 42 - Design of Induction Machine- Rotor Design - 3 (Rotor Slot Geometry)
Lecture 43 - Design of Induction Machine- Rotor Design - 4 (Skewing of Rotor)
Lecture 44 - Design of Induction Machine- Rotor Design - 4 (Resistance of Rotor Winding)
Lecture 45 - Carter's Coefficient of Electrical Machines
Lecture 46 - Effective Length Equations of the Machine Core with Different Stator and Rotor Lengths
Lecture 47 - Stator MMF and Magnetizing Current Equations of Induction Machine
Lecture 48 - Magnetizing Inductance of Induction Machine
Lecture 49 - Stator and Rotor Leakage Inductances of Induction Machine
Lecture 50 - Equivalent Circuit Parameters of Induction Machine
Lecture 51 - Loss Calculation of Induction Machine - 1
Lecture 52 - Loss Calculation of Induction Machine - 2 and Performance Parameters of Induction Motor
Lecture 53 - Switched Reluctance Machine Sizing Equations-Output Power and Volume (D2L) Product Equation
Lecture 54 - The Figure of Merits for SRM and Example Problem on Output Power Equation i t f D2L Product
Lecture 55 - Design of Switched Reluctance Machine: Stator Design - 1
Lecture 56 - Design of Switched Reluctance Machine: Stator Design - 2 and Rotor Design
Lecture 57 - Procedure for Calculation of SRM Inductance: Aligned Inductance - 1
Lecture 58 - Calculation of SRM Inductance: Aligned Inductance - 2
Lecture 59 - Efficiency and Loss Calculation of SRM
Lecture 60 - Importance of Thermal Design and Thermal Limits for Electrical Machines
Lecture 61 - Electric and Thermal Circuits Interface
Lecture 62 - Heat Transfer Methods and Basic Equations for Thermal Resistance
Lecture 63 - Heat Flow in Electrical Machines
Lecture 64 - Cooling Methods and Standards for Electrical Machines
Lecture 65 - Basics of Thermal Equivalent Circuits
Lecture 66 - Thermal Equivalent Circuit - 1
Lecture 67 - Thermal Equivalent Circuit - 2

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