

ELECTRICAL TECHNOLOGY

Course Code: 13EE1144

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Pre requisites: Mathematics and Networks.

Course Educational Objectives:

In this course the different types of Instruments, DC generators, DC motors, Induction Motors, Alternators and Single Phase Motors which are widely used in industry are covered and their performance aspects will be studied.

Course Outcomes:

After completion of this course, the students shall have knowledge about Electrical Machines (both A.C and D.C) and their performances.

UNIT-I

(12 Lectures)

DC MACHINES:

Principle of operation of DC Machines- EMF equation – Types of generators – Magnetization and load characteristics of DC generators. DC Motors – Types of DC Motors – Characteristics of DC motors – 3-point starters for DC shunt motor – Losses and efficiency – Swinburne’s test – Speed control of DC shunt motor – Flux and Armature voltage control methods.

UNIT-II

(12 Lectures)

TRANSFORMERS:

Principle of operation of single phase transformer – types – Constructional features – Phasor diagram on No Load and Load – Equivalent circuit, Losses and Efficiency of transformer and Regulation – OC and SC tests – Predetermination of efficiency and regulation (Simple Problems).

UNIT-III**(12 Lectures)****INDUCTION MOTORS:**

3-Phase: Principle of operation of Three-phase Induction motors – Slip ring and Squirrel cage motors – Torque equation-Slip-Torque characteristics – Efficiency calculation – Starting methods. Single Phase: Principle of operation - Shaded pole motors – Capacitor motors, AC servomotor, AC tachometers, Synchros, Stepper Motors – Characteristics.

UNIT-IV**(12 Lectures)****SYNCHRONOUS MACHINES:**

Constructional features – Principle of operation – Types - EMF Equation – Distribution and Coil span factors – Armature parameters-armature resistance-synchronous reactance-phasor diagram-unity power factor-lagging power factor –leading power factor-Predetermination of regulation by Synchronous Impedance Method – OC and SC tests-principle of operation of synchronous motors.

UNIT-V**(12 Lectures)****ELECTRICAL INSTRUMENTS:**

Types of instruments (Indicating, integrating, Recording)- Basic Principles of indicating instruments – Moving Coil and Moving iron Instruments (Ammeters and Voltmeters) wattmeters and energy meters.

TEXT BOOKS:

1. M.S Naidu and S. Kamakshaiah, “*Introduction to Electrical Engineering*”, Tata McGraw Hill Publication, 4th Edition, 2011.
2. Vincent Del Toro, “*Electrical Engineering Fundamentals*”, PHI Publishers 5th Edition, 2009.

REFERENCES:

1. V.K Mehta “*Principles of Electrical Engineering*” S.Cand Publications, 5th Edition, 2005.
2. I.J. Nagrath and D.P Kothari “*Theory and Problems of Basic Electrical Engineering*” PHI Publications, 4th Edition, 2009.
3. David V. Kerns, JR. J. David Irwin, “*Essentials of Electrical and Computer Engineering*”, TMH Education Pvt. Ltd, 3rd Editions, 2008.

