EEC 343 - ELECTROMECHANICAL DEVICES AND MACHINES I

COURSE CONTENT

MODULE I: PRINCIPLE OF ELECTROMECHANICAL ENERGY CONVERSION

    a. Energy conversion process

    b. Magnetic circuits analysis (Fringing effects, mmf, B-H curve, Reluctance, electromagnetic circuit analogy)

    c. Flux linkage and inductance (Self and mutual inductance, leakage inductance)

    d. Magnetic stored energy

    e. Magnetic/ Total core loss (Hysteresis and eddy current losses)

MODULE II: TRANSFORMERS

    a. Elements of a transformer (flux linkages, windings/voltage/current ratios of transformer)

    b. Ideal transformer analysis

    c. Circuit model of the iron core practical transformers

    d. Impedance of a transformer, transformer losses and efficiency

    e. Transformer tests (open and short circuit test)

    f. Voltage regulation

    g. 3 phase transformers and connection in power systems

    h. Auto transformer and applications-Instrument transformer

MODULE III: DC MACHINES

    a. Design, construction, structures, windings and characteristics

    b. Emf equations, armature reactions and commutation

    c. Losses and efficiency

    d. Performance and speed control of DC motions

e. Industrial applications of DC machines

f. Simulation of Electromagnetic devices

REFERENCE

1. Electrical machines by D.P Kothari and I.J Nagrath, Fourth edition, Tata McGraw hill education private limited.

2. Electric machinery fundamentals by Stephen J. Chapman, Fourth edition McGraw Hill Higher Education