



Department of Electrical Engineering

Indus Institute of Technology & Engineering

Ph.D Syllabus

Basic of electrical Engineering.

Concept of Single and three phase AC circuits, phasor/ vector notations. Power relation in AC circuit. Concept of resonance and its effect. Electrostatic and magnetic circuits.

Electrical Machines

Electromechanical Energy Conversion, D.C. Generator, DC Motors, Single-phase Transformers, Three-phase Transformers, Auto-transformers, Induction Motor, Synchronous Motor, Alternators, DFIG, special machine.

Electrical Measurement

Potentiometers & Instrument transformers, Transducers, DC & AC bridges, Measurement of voltage, current, Power & Energy

Network Analysis

Important network theorems, network topology, coupled circuit, Transient analysis, network functions

Control Theory

Mathematical Modeling, Steady State Response Analysis, Frequency Response Analysis, Time domain Stability Analysis, State Space Analysis of Control Systems, nonlinear systems stability. Control algorithms, knowledge of distributed control system

Power System

Generation, Transmission and Distribution Systems, Load on Power Station, Economics of power generation & Tariff, Overhead Transmission Lines, Underground Cables, Representation of Power System Components, Symmetrical Fault Analysis, Unsymmetrical Fault Analysis, Power System Transients, Distributed Generation (DG),

Control and operation of micro grid, power quality and stability issues. Load forecasting and planning.

High Voltage Engineering

Electrical Breakdown In Gases, Liquids & Solid Dielectrics, Generation of Various Types of High Voltages, Measurements Of High Voltages & Currents, HV Testing Of Electrical Apparatus, EHVAC transmission

Switchgear & Protection

Circuit breaker, Protective relays, protection of generator, motor, transformers and other electrical devices. Bus bar protection

Computational Techniques

Soft computing techniques, Genetic algorithm, fuzzy logic, artificial neural networks. Different optimization methods, PSO, DE, AAA etc

Reference Book:

Electrical Engineer's Reference Book, 6th Edition, 2003, M.A. Laughton and D.J. Warne, ELSEVIER, ISBN 978-0-7506-4637-6.

Standard Handbook for Electrical Engineers, 6th Edition, H. Wayne Beaty Donald G. Fink, The McGraw-Hill Companies, Inc. ISBN: 9780071762328