

ECE 3414 - FUNDAMENTALS OF ENERGY SYSTEMS

TEXT BOOK: Zia A. Yamayee, Juan L. Bala “Electromechanical Energy Devices and Power Systems “. First Edition, 1994, John Wiley & Sons, Inc.

TOPICS:

Energy Resources and Power System Components
Basic AC Circuit Concept. Single-Phase AC Circuit
Balanced Three-Phase AC Circuit. Per-Unit Analysis
Magnetic Circuits. Faraday’s Law. Inductance
Transformers: Construction, Equivalent Circuit for Single-Phase Transformer
Transformers: Voltage Regulation, Efficiency
Transformers: Determination of Equivalent Circuit Parameters
Transformers: Autotransformers
Transformers: Three-Phase Transformers
DC-Mach: Basic Principles of Operation, Types
DC-Mach: DC Generator Performance
DC-Mach: DC Motor Performance
Syn-Mach: Equivalent Circuit
Syn-Mach: Open-Circuit and Short-Circuit Characteristics.
Syn-Mach: Power-Angle Characteristics
Syn-Mach: Generators Synchronization,
Syn-Mach: Motor Performance, V-curves
Ind-Mach: Construction, Slip
Ind-Mach: Equivalent Circuit of a Three-Phase Ind. Motor
Ind-Mach: Determination of Parameters from Tests
Ind-Mach: Torque-Speed Characteristics
Single-Phase Induction Motors: Equivalent Circuit, Performance
Single-Phase Induction Motors: Starting Condition