

Review Topics for EE 330 Energy Systems

(Disclaimer: This list is not guaranteed to be comprehensive.)

Appendix A Three-Phase Circuits

- voltages & currents in Wye & Delta Connections
- power relationships- phase & line quantities, power factors
- real, reactive, apparent, and complex powers
- balanced systems
- one-line diagrams
- power triangle

Chapter 1 Introduction to Machinery Principles

- units & notation
- rotational motion & power
- Magnetic fields
- Faraday's Law
- Magnetic circuits
- Induced Force & Voltage
- linear DC machines

Chapter 2 Transformers

- ideal transformers
- single-phase transformers
- equivalent circuit for transformers
- per-unit system of measurements
- voltage regulation & efficiency
- three-phase transformers
- 3-phase transformation using 2 transformers
- transformer ratings

Chapter 3 AC Machinery Fundamentals

- simple loop
- rotating magnetic fields
- mmf & flux distribution
- induced voltage and torque
- power flows & losses
- voltage & speed regulation

Chapter 4 Synchronous Generators

- speed of rotation
- internal generated voltage
- equivalent circuit
- phasor diagram
- power & torque
- measuring model parameters
- single operation
- ratings

Chapter 5 Synchronous Motors

- Not covered on final

Chapter 6 Induction Motors

- basic concepts
- equivalent per-phase circuit
- power & torque and torque-speed relationships
- starting
- determining model parameters
- ratings

Chapter 7 DC Machinery Fundamentals

- basic concepts
- simple loop- induced voltage & torque
- commutation
- commutation & armature in real machines (i.e., winding schemes, # conductors, ...)
- internal voltage & induced torque
- power flow & losses

Chapter 8 DC Motors and Generators

- Equivalent circuit(s) for DC motors
- Magnetization curve(s) for DC machines
- Separately-excited and shunt DC motors
- Permanent-magnet DC motors
- Series DC motors
- Compounded DC motors