

SYLLABUS

ESE-350 - ELECTRIC POWER SYSTEMS

DATE	SESSION #	TOPIC	HOMEWORK
	1	CHAPTER 1 INTRODUCTION - History of the Power Industry - Structure of an Electrical Power System - Electrical Energy Transmission - Electrical Energy Production - Electrical Loads	
	2	CHAPTER 2 SINUSOIDAL STEADY STATE CIRCUIT CONCEPTS - Phasor Representation - Impedances of Passive Elements - Power in Sinusoidal Steady-State Circuits	
	3	CHAPTER 2 SINUSOIDAL STEADY STATE CIRCUIT CONCEPTS (CONTINUED) - The General Balanced Three-Phase System - Symmetrical Components - The "a Operator" as used in Symmetrical Component Representation - The Effect on Impedance - Power Considerations	
	4	CHAPTER 3 POWER SYSTEM REPRESENTATION - Per-Phase Analysis - The Per-Unit System - The One-Line Diagram	
	5	CHAPTER 4 TRANSMISSION LINES - Line Series Resistance - Line Series Impedance - Shunt Admittance - Line Compensation - Line Insulation and Lightning - The Surge Arrester - dc Transmission - Corona	

NOTES:

- Homework assignments are due at next session.
 - The weekly quiz will cover material discussed during previous session.
 - Final grade will be determined as follows:
- | | |
|-------------------------------|--|
| Homework/ Quiz/ Participation | 20% |
| Field Trip Reports | 14% (Team written report, and oral presentation) |
| First Exam | 33% |
| Second Exam | 33% |
| | 100% |

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	5	CHAPTER 5 THE POWER TRANSFORMER - The Three-Winding Ideal Transformer Equivalent Circuit - A Practical Three-Winding Transformer Equivalent Circuit - Transformers in Three-Phase Connections - Phase Shift in Wye-Delta Connections - The Two-Winding Transformer - Determining Per-Phase Equivalent Circuit Values for Power Transformers	
	6	REVIEW	
	7	EXAM	
	8	EXAM REVIEW CHAPTER 6 THE SYNCHRONOUS MACHINE - Synchronous-Machine Construction - The Synchronous-Machine Equivalent Circuit - The Turbine-Generator-Exciter System - Operating Limits on Synchronous Generators - The Salient-Pole Synchronous Machine - Synchronous-Machine Electrical Transient Performance	
	9	CHAPTER 8 OPERATING AND CONTROLLING POWER SYSTEMS - The Economic Dispatch - Economic Dispatch Considering Losses - System Voltage Control - Phase-Changing Transformers	

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	10	CHAPTER 9 BALANCED AND UNBALANCED FAULTS - The System Model - The Balanced Three-Phase Fault - The Single-Line-to-Ground Fault - The Line-to-Line Fault - The Double-Line-to-Ground Fault - Interior Voltages and Currents in Faulted Systems - Prefault Load Current	
	11	POWER PLANT FIELD TRIP	
	12	FIELD TRIP ORAL REPORTS RENEWABLE AND ADVANCED ELECTRIC POWER SYSTEMS - Solar Power Systems - Wind Energy - Fuel Cells - Geothermal - Other	
	13	ENVIRONMENTAL IMPACTS and MITIGATION REVIEW	
	14	REVIEW	
	15	FINAL EXAM	

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