

**ELECTRIC UTILITY SUBSTATION AND RELAY TECHNOLOGY  
COURSE DESCRIPTIONS**

	<b>Class</b>	<b>Lab</b>	<b>Work Exp/ Clinical</b>	<b>Credit</b>
<b>EUS 110 - Intro to Elect Util Ind</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>4</b>
Prerequisites: ENG 090, MAT 080, RED 090				
Corequisites: None				
This course provides the student with an overview of the electric (power) utility industry. Topics include electric utility regulation and its scope, regulatory agencies and codes, general safety, electric system overview, electric generation, electric transmission, and electric distribution. Upon completion, students should be able to understand the need for electric utilities, their structure, and regulatory requirements on electric utilities.				
<b>EUS 120 Elect Util Sys Ov &amp; Oper</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>3</b>
Prerequisites: CIS 110, ELC 112, EUS 110, MAT 171				
Corequisites: None				
This course introduces the basic design, development, and operation of the electrical power grid in North America. Topics include types of generation, transmission voltages, interconnection of utility systems, scheduling generation to meet demand, maintaining adequate voltages, and reliability. Upon completion, students should be able to understand how electricity is generated, transmitted, and delivered reliably to all customers.				
<b>EUS 130 Electric Util Print Reading</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>2</b>
Prerequisites: ELC 112, EUS 110, MAT 171				
Corequisites: None				
This course introduces the basic principles of reading electrical drawings used in the utility industry. Topics include functional diagrams, AC and DC control schematics, wiring diagrams, control wiring diagrams, and logic diagrams. Upon completion, the student should be able to understand the purpose of each type of drawing and answer questions based on the information in the drawings.				
<b>EUS 210 Lg High Volt Power Trans</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>3</b>
Prerequisites: ELC 117, EUS 120, EUS 130, MAT 172				
Corequisites: None				
This course introduces the fundamentals of large power transformers used in the electrical utility industry with emphasis on function and criticality. Topics include understanding the various designs, load calculations, dissolved gas analysis, assembly, commissioning tests, available accessories, bushings, maintenance, and trouble shooting. Upon completion, students should be able to identify the various winding configurations and connections, interpret nameplate information, and perform various tests on transformers.				

**EUS 220 High Volt Power Cir Br** 2 3 0 3

Prerequisites: ELC 117, EUS 120, EUS 130, MAT 172

Corequisites: None

This course introduces the fundamentals of high voltage power circuit breakers used in the electrical utility industry with emphasis on function and criticality. Topics include understanding the various designs and interrupting mediums, how circuit breakers interrupt fault currents, Sulfur Hexafluoride gas (SF6), breaker timing, and maintenance. Upon completion, students should be able to identify various types of circuit breakers, interpret nameplate information, and perform various tests on these devices.

**EUS 230 Electric Util Prot Rel** 2 3 0 3

Prerequisites: ELC 128, EUS 210, EUS 220, MAT 271

Corequisites: None

This course introduces the art of protective relaying used in the electrical utility industry with emphasis on function and criticality. Topics include substations zones protection, transmission lines, switchyards, relays, and power line carrier components. Upon completion, students should be able to understand the purpose for various relay schemes and protective relay.

**EUS 240 Substation Ancillary Sys** 2 3 0 3

Prerequisites: ELC 128, EUS 210, EUS 220, MAT 271

Corequisites: None

This course introduces many of the supporting systems used in substations and generating plant switchyards to support the operation of the electric power grid. Topics include instrument transformers, capacitor banks, reactor banks, batteries, circuit switchers, bushings, disconnect switches, and ground grids. Upon completion, the student should be able to understand the design and purpose of each of these devices and systems.

**EUS 250 Metering Technology** 2 3 0 3

Prerequisites: ELC 128, EUS 210, EUS 220, MAT 271

Corequisites: None

This course covers single and three-phase metering principles, meter construction, component parts, and the installation and testing of single and three-phase meters. Topics include instrument transformer theory and applications, sizing instrument transformers, wiring transformers, meter installations, and electronic meter functionality. Upon completion, students should be able to install and test single and three-phase meters.

**EUS 260 Cap & Case Studies in EUSRT** 2 0 0 2

Prerequisites: ELC 128, EUS 210, EUS 220, MAT 271

Corequisites: None

This course is a capstone course that will utilize topics that were covered throughout the curriculum. A large portion of the course will examine case studies from the utility and other industries. Upon completion, students will understand how the proper use of program components can minimize the risks of accidents.

*Approved by RCC Curriculum Committee 3/22/11  
Effective Fall 2011*