

Electrical Power Technology A.A.S.

— Relay Technology Option

Program Description

This plan of study is designed to train technicians to perform electrical tests and repairs concerned with maintenance and performance evaluation of various electro-mechanical and solid state relays to prevent and remedy abnormal behavior or failure of transmission and distribution lines and equipment; connect test apparatus to troubled circuits; analyze test results and interpret electrical diagrams to locate defective relays and make adjustments or remove relay for repair; analyzes test data to determine performance characteristics of relays and effect of system modifications on relay performance and prepares reports of work performed.

Technical Occupational Specialty

			35 Credit Hours	Date	Institution
<input type="checkbox"/>	EET	1104	Fundamentals of Electricity	4	
<input type="checkbox"/>	EET	1244	Circuit Analysis	4	
<input type="checkbox"/>	EPT	1103	Print Reading	3	
<input type="checkbox"/>	EPT	1123	Electrical Systems Components	3	
<input type="checkbox"/>	EPT	2063	Electrical Systems Protection	3	
<input type="checkbox"/>	EPT	2503	Transformers	3	
<input type="checkbox"/>	EPT	2113	Substation Relays	3	
<input type="checkbox"/>	EPT	2313	Substation Operations	3	
<input type="checkbox"/>	EPT	2513	Substation Construction & Maintenance	3	
<input type="checkbox"/>	EPT	2413	Advanced Electrical Systems	3	
<input type="checkbox"/>	EPT	2603	Capstone/Advanced Techniques/Problems	3	

Degree Awarded

Associate in Applied Science

Support & Related Courses

			9 Credit Hours	Date	Institution
<input type="checkbox"/>	CIS	1113	Computer Concepts with Applications	3	
<input type="checkbox"/>	FPST	1313	Industrial Safety	3	
<input type="checkbox"/>	MATH	1613	Trigonometry	3	

For More Information

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Division Head

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General Education Courses

			18 Credit Hours	Date	Institution
<input type="checkbox"/>	ENGL	1113	English Composition I	3	
<input type="checkbox"/>	ENGL	1213	English Composition II	3	
or					
<input type="checkbox"/>	ENGL	2333	Technical Report Writing	3	
<input type="checkbox"/>	HIST	1483	U.S. History to 1865	3	
or					
<input type="checkbox"/>	HIST	1493	U.S. History Since 1865	3	
<input type="checkbox"/>	MATH	1513	College Algebra	3	
<input type="checkbox"/>	POLS	1113	American Government	3	
<input type="checkbox"/>	SPCH	1113	Speech Communication	3	

Total to Graduate

62 Credit Hours

Student Name:	_____
CWID:	_____
Counselor:	_____
Catalog 2009-2010	

***CIS 1113 COMPUTER CONCEPTS WITH APPLICATIONS**

Provides students with an introduction to concepts and applications of the personal computer in business. Topics include spreadsheets, databases, word processing, ethics, vocabulary, Internet skills and file system management. Theory and hands-on computer instruction is included. Prerequisite: READ 0033 or [R].

EET 1104 FUNDAMENTALS OF ELECTRICITY

Elementary principles of electricity covering basic electric units, OHM's law, Kirchoff's law, circuit solutions, network solutions, magnetism, inductance and capacitance. Lab: two hours per week. Co-requisite: MATH 1513.

EET 1244 CIRCUIT ANALYSIS I

The study of transient analysis and network theorems for electric circuits. This course introduces resonant circuits, filters, AC power and computer aided circuit analysis techniques. Lab: two hours per week. Prerequisite: EET 1104. Co-requisite: MATH 1613.

EPT 1103 PRINT READING

This course gives students an introduction to the different schematics used in power plant operations and electrical transmission and distribution systems. Students will gain an understanding of the standard symbols used in the various systems schematics and how to read them. Students learn how to read basic piping and instrumentation diagrams, and how to interpret single line electrical diagrams. Students finish the course by studying electrical system diagrams beginning at the generator and following through to the distribution system. **Lab 2 hours per week.**

EPT 1123 ELECTRICAL SYSTEMS COMPONENTS

This course takes an in-depth look into the components used in the transmission of electricity. Students begin with a study of switchyards and substations, and then learn the operation of transformers, circuit breakers, regulators, capacitor banks, battery banks, tap changers, disconnects, current and potential transformers and lightning arrestors. Students also study the various types of electrical conductors, structures and insulators used in the transmission of electricity. Finally, students learn the components, which make up a typical substation and how it feeds a distribution network that supplies customers with electricity. Lab 2 hours per week.

EPT 2063 ELECTRICAL SYSTEMS PROTECTION

This course covers protection fundamentals, philosophies and principles used to protect the electrical system, beginning with the generator itself. Various types of relays, input sources and system grounding are also covered. Lab 2 hours per week.

EPT 2113 SUBSTATION RELAYS

This course focuses on testing and calibrating substation equipment, including voltage testing on equipment feeder relays and circuit breaker relays. Students also learn the various test that need to be conducted on protective relays, such as over current and voltage relays, directional and line relays as well as ground and test device testing. Lab 2 hours per week.

EPT 2313 SUBSTATION OPERATIONS

This course will detail the specifics of power electronics as applied in substations for power transmission. It will describe typical functions provided in utility substation automation systems and some important considerations in the interface between substations equipment and the automation systems components. Student will look at the operation in a competitive environment. Oil containment, animal issues and security will also be discussed and the requirements necessary to qualify a substation to withstand seismic events. The operation of substation fire protections and substation communications systems such as the SCADA system and the SCADA security will be examined.

EPT 2403 ADVANCED ELECTRICAL SYSTEMS

The design and operation of an electrical system including an understanding of switchyard construction and the different configurations, and how different sections of the transmission and distribution systems can be safely isolated will be studied. The courses will review how storm and conditions can affect the electrical system. The students will learn the procedures used by systems operators and line crews to maintain safe and effective delivery of power during adverse conditions and steps necessary to restore power after outages. Lab 2 hours per week.

EPT 2503 TRANSFORMERS

This course begins with a review of basic transformer design and operation. Students will study 3-phase transformers, single phase loads for 3-phase transformers, and the different connections used such transformers. The course introduces students to installation procedures and maintenance procedures for transformers. 2 hour of lab per week.

EPT 2513 SUBSTATION CONSTRUCTION AND MAINTENANCE

The basic construction techniques of a substation, including electrical equipment rigging and installation, cable tray and conduit installation, cable controls and panel wiring, as well as a wide variety of installation procedures for electrical components and protection equipment. Basic hand and power tools required to build the substation will be reviewed in addition to safety procedures. 2 hour of lab per week.

EPT 2603 CAPSTONE

This course will include topics that have not been covered in the previous courses and will include interview skills, evaluation of the job market and employment opportunities. This course will be normally be taken in the students last semester.

FPST 1313 INTRODUCTION TO OCCUPATIONAL SAFETY

A course in industry safety, giving an overview of state and national regulations in safety. The course will also cover the basic areas of an industrial safety program, as well as reporting, investigating and analyzing the results.

MATH 1613 TRIGONOMETRY (A)

Trigonometric functions, solution of right and oblique triangles and applications to engineering. Prerequisite: MATH 1513 or concurrent enrollment.