Program **ELECTRICAL TECHNOLOGY**

CHEM 175 **APPLIED GENERAL AND ORGANIC CHEMISTRY** **Credit** **6.0**

150 Hours

Course Description

The student will be introduced to basic chemistry principles, measurements, periodic table, chemical equations, molecular structures, chemical reactions, and organic chemistry including hydrocarbons, functional groups, and macromolecules as they apply to the knowledge and abilities required for entry into Phase II of the Applied Process Technologies Program.

Prerequisite or Corequisite: MTH 175

Lecture: **Yes** Lab: **Yes** Experience: **No**

TASK LIST

1	Differentiate between mass and weight: include the instruments used to measure each
2	Know the metric units of mass, length, and volume
3	Set up and solve problems utilizing the method of dimensional anaylsis (factor-label method)
4	Calculate the density, mass or volume of an object from the appropriate data
5	Classify common materials as elements, compounds, or mixtures
6	Understand how symbols, including subscripts and parentheses, are used to write chemical formulas
7	Distinguish between the physical and chemical properties of matter
8	Differentiate clearly between heat and temperature
9	Write the formulas of compounds formed by combination of ions in the correct ratios
10	Assign the oxidation number to each element in a compound or ion
11	Write the names or formulas for inorganic binary compounds
12	Convert grams, atoms, molecules, and molar masses to moles and vice versa
13	Determine the molar mass of a compound from its formula
14	Calculate the percent composition of a compound from its formula
15	Know the format used in setting up chemical equations
16	Interpret a balanced equation in terms of the relative numbers or amounts of molecules, atoms, grams, or moles of each substance represented
17	Classify equations as combination, decomposition, single-displacement, or double-displacement reactions.
18	Apply theoretical yield or actual yield to any of the foregoing types of problems or calculate theoretical and actual yields of a chemical reaction
19	Write the electron configuration for any of the first 56 elements
20	Explain what is represented by the Lewis-dot (electron-dot) structure of an element

21 Indicate the locations of the metals, nonmetals, metalloids, and the noble gases in the periodic table

22 Identify groups of elements by their special family names

23 Distinguish clearly between ionic and molecular substances

24 Estimate the relative rates of effusion of two gases of known molar mass

25 State Boyle's, Charles' and Gay-Lussac's laws. Use all of them in problems

26 Determine the density of any gas at STP

27 Determine the molar mass of a gas from its density at a known temperature and pressure

28 Explain the process of evaporation from the standpoint of kinetic energy

29 Relate vapor pressure data or vapor pressure curves of different substances to their relative rates of evaporation and to their relative boiling points

30 Outline the process necessary to prepare potable water from a contaminated source

31 Describe how water may be softened by distillation, chemical precipitation, ion exchange, and demineralization

32 Calculate the molarity of a solution from the volume and the mass or moles of solute

33 Understand the process of acid-base neutralization

34 Calculate the molarity, normality, or volume of an acid or base solution

35 Identify the oxidizing agent and the reducing agent in an oxidation-reduction reaction

36 List the characteristics that distinguish alpha particles, beta particles and gamma rays from the standpoint of mass, charge, relative velocities and penetrating power

37 Explain how the fission of U-235 can lead to a chain reaction and why a critical mass is necessary

38 Describe the tetrahedral nature of the carbon atom

39 Write the names and formulas for the first ten normal alkanes

40 Write structural formulas and IUPAC names for the isomers of an alkane or a halogenated alkane

41 Give the IUPAC name of a hydrocarbon or a halogenated hydrocarbon when given the structural formula and vice versa

42 Write structural formulas and names for simple cycloalkanes

43 Demonstrate knowledge of the octane number rating system for gasoline and discuss methods for increasing the octane number

44 Distinguish, by formulas, the difference between saturated and unsaturated hydrocarbons

45 Name and write structural formulas of alkenes, alkynes, cycloalkenes and aromatic compounds

46 Write equations for the addition reactions of alkenes and alkynes

47 Distinguish, using simple chemical test, among alkanes, alkenes and alkynes

48 Describe the nature of benzene and how its properties differ from open chain unsaturated compounds

49 Name mono-substituted, di-substituted and poly-substituted benzene compounds

50 Draw structural formulas of substituted benzene compounds

51 Recognize the more common fused aromatic ring compounds

52 Name alcohols by common and IUPAC methods

53 Write the structural formula when given the name of an alcohol

54 Name the phenols and write their formulas

55 Demonstrate knowledge of the general properties of phenols

56 Demonstrate knowledge of the differences in properties of the hydroxyl group when bounded to an aromatic ring (a phenol) and to an aliphatic group (an alcohol)

57 Name ethers and write their formulas

58 List major properties for thiols

59 Recognize aldehydes and ketones from their formulas

60 Give IUPAC and common names for aldehydes and ketones

61 Write structural formulas for saturated carboxylic acids, unsaturated acids, hydroxy acids, aromatic carboxylic acids and di-carboxylic acids

62 Write common names, IUPAC names and formulas of esters

63 Name and write structural formulas for amides

64 Name and write structural formulas for amines

65 Show that amines are bases in their reactions with water and with acids

66 Write formulas for addition polymers when given the monomer(s)

67 Write formulas for condensation polymers when given the monomer(s)

68 Explain the free radical mechanism for polymer formations

69 Identify polymers from their trade names (for example, Dacron, nylon, and Teflon)

70 Explain vulcanization and its effect on rubber

71 Identify polymers by type (such as vinyl, polyester, polyamide or polyurethane)

Program **ELECTRICAL TECHNOLOGY**

CPU 040 **TOUCH KEYBOARDING** **Credit** **1.0**

45 Hours

Course Description

This course is designed to develop skill in operating a keyboard by touch. Instruction should begin prior to students using computers for document production. The course emphasizes the development of the skill of entering alphabetic, numeric, and symbolic information on a keyboard. The student will receive instruction on proper "touch" keyboarding techniques and the care and operation of a computerized workstation.

Prerequisites: None

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 Introduce and demonstrate proper position of body and hands, keep eyes on copy, and follow directions

2 Introduce keys beginning with the home row (striking the correct keys without looking at the fingers)

3 Maintain smooth rhythmic stroking patterns

4 Develop finger dexterity

5 Develop eye-hand coordination

6 Practice skills with repetition and continuous reinforcement

7 Keep workstation neat and orderly

8 Operate keyboard: function, alphabetic and numeric/symbol keys

9 Key three 1-minute timed writings with a minimum of 20 wpm

Program **ELECTRICAL TECHNOLOGY**

CPU 100 **INTRODUCTION TO COMPUTERS** **Credit** **3.0**

45 Hours

Course Description

Students use a microcomputer to develop basic skills using the mouse and keyboard to perform simple operating system functions and application software competencies. Terminology, impact on society, technology awareness and ethical issues are presented. CPU 100 is designed for the entry-level users and satisfies the computer literacy requirement.

Prerequisites: **None**

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Demonstrate knowledge of computer terminology

2 Perform functional keyboarding techniques

3 Perform operating system functions and identify file specifications

4 Demonstrate knowledge of an icon-based environment

5 Use application software relevant to individual program needs to create, apply mechanics, edit, save, print, and retrieve documents

6 Develop technology awareness

7 Practice computer ethics

8 Perform routine maintenance

Program **ELECTRICAL TECHNOLOGY**

CPU 150 **COMPUTER FUNDAMENTALS** **Credit** **3.0**

45 Hours

Course Description

Students use a microcomputer to develop skills in using the operating system and application software including word processing, database, spreadsheet, and the Internet. Communication skills, terminology, impact on society, technology awareness, and ethical issues are presented.

This course is intended for the student with some computer-related experience or training. This course satisfies the computer literacy requirement and may be substituted for CPU 100 as a program requirement.

Prerequisites: Consent of the Instructor

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Demonstrate knowledge of computer terminology

2 Perform operating system functions and identify file specifications

3 Demonstrate knowledge of an icon-based environment

4 Use word processing software to compose, edit, save, retrieve and print documents

5 Use spreadsheet software to formulate, edit, calculate, save, retrieve and print spreadsheets

6 Use database software to create, edit, save, retrieve, search, sort and print database reports

7 Describe multimedia applications based on presentation software

8 Demonstrate knowledge of Internet procedures and protocol

9 Identify network applications

10 Perform routine maintenance

Program **ELECTRICAL TECHNOLOGY**

CPU 200 **MICROCOMPUTER OPERATING SYSTEMS** **Credit** **3.0**

45 Hours

Course Description

This course identifies and develops an understanding of the role of an operating system in microcomputing. "Hands-on" applications are provided in the use of the operating system. The rules and logic of operating system commands and device drivers are introduced. Preparing and maintaining a disk through the management of directories and files is also included.

Prerequisite: CPU 100, CPU 150, or Consent of Instructor

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Introduce system commands
2	Perform essential file management techniques
3	Identify types and procedures for making a backup of hard disk
4	Identify purpose and use of advanced operating system commands
5	Define and identify files by icon, name, extension, directory, subdirectory, or folder
6	Identify and describe file flags: archive, hidden, read only, and system files
7	Create, add, run, modify, move, and delete a program item or shortcut
8	Copy and paste between programs
9	Use Windows to choose a printer and print a document
10	Identify and use the Windows Help feature
11	Identify characteristics and features of a Local Area Network
12	Identify peer-to-peer and client/server LAN software
13	Identify applications of networks such as E-mail, homepage, and internet

Program **ELECTRICAL TECHNOLOGY**

CPU 299 **INDUSTRIAL COMPUTER APPLICATIONS** **Credit** **3.0**

45 Hours

Course Description

This course will develop skills and awareness of computer applications that are specific to industry in a program area. The specific competencies should be developed jointly with the program instructor and computer instructor. This course will allow for the customization of computer-related course offerings for industry specific needs and may be repeated to cover multiple computer-related topics.

This course does not satisfy the computer literacy requirement.

Prerequisite: Consent of Instructor

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Competencies are individually tailored to the needs of students in a particular program area

Program **ELECTRICAL TECHNOLOGY**

EET 101 **ELECTRICAL/ELECTRONIC SAFETY** **Credit** **3.0**

45 Hours

Course Description

This course provides practical training in industrial safety. The students are taught to observe general safety rules and regulations, apply work site and shop safety rules, and to apply OSHA regulations.

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Apply work site and shop safety procedures

2 Apply personal safety rules and procedures

3 Apply fire prevention rules and procedures

4 Demonstrate hazardous communications procedures

5 Describe and demonstrate universal/standard precautions procedures

Program **ELECTRICAL TECHNOLOGY**

EET 102 **ADVANCED MATHEMATICS FOR ELECTRONICS** **Credit** **2.0**

90 Hours

Course Description

This course provides the student with a working knowledge of digital mathematics and the application of mathematical ideas used to solve computer mathematical problems. Binary, octal, and hexadecimal number systems are covered as is Boolean algebra and its application to computer circuits.

Prerequisite: MTH 170 or Consent of Instructor

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 Demonstrate a knowledge of basic mathematics and algebra

2 Apply the principles of algorithms in computer programs

3 Utilize different based number systems

4 Utilize number systems and codes

5 Demonstrate a knowledge of logic gates and Boolean algebra

6 Utilize combinational logic circuits

7 Perform digital arithmetic operations

8 Perform operations representing binary signed numbers

9 Design and build a digital project

10 Utilize basic digital devices

Program **ELECTRICAL TECHNOLOGY**

EET 104 **DIRECT CURRENT CIRCUITS** **Credit** **3.0**

45 Hours

Course Description

Introduces the theory of electricity and magnetism, and the relationship of voltage, current, resistance, and power in electrical circuits. Circuit analysis techniques are stressed. DC circuits are analyzed using Ohm's Law, Kirchoff's Laws and various network theorems.

Prerequisites: Consent of Instructor

Corequisite: EET 105

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Apply shop and electrical safety practices
2	Identify and use basic hand tools
3	Care for and maintain hand tools
4	Solder/desolder electrical connections
5	Operate power suplies
6	Compute,measure, and identify conductance and resistance of conductors and insulators
7	Measure properties of a circuit using VOM and DVM meters
8	Solve electrical circuit problems using Ohm's Law
9	Analyze, construct and troubleshoot parallel circuits
10	Analyze, construct and troubleshoot series circuits
11	Analyze, construct and troubleshoot series-parallel circuits
12	Analyze basic motors, generator theory and operation
13	Use network theorems to build and analyze complex circuits
14	Analyze, construct and troubleshoot maximum power transfer circuits
15	Determine physical and electrical characteristics of capacitors and inductors
16	Analyze, construct and troubleshoot time constant circuits

Program **ELECTRICAL TECHNOLOGY**

EET 105 **DIRECT CURRENT CIRCUITS LAB** **Credit** **2.0**

90 Hours

Course Description

The basic DC lab course allows the student to verify basic DC theory by making measurements in working DC resistive circuits and DC application of capacitors and inductors.

Prerequisites: Consent of Instructor

Corequisite: EET 104

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 104

Program **ELECTRICAL TECHNOLOGY**

EET 106 **ALTERNATING CURRENT CIRCUITS** **Credit** **3.0**

45 Hours

Course Description

The alternating current circuits course is designed to develop an understanding of alternating current fundamentals and theory with emphasis on the study of reactance, resonance, RC, RL, RLC, transformers, phase angles and power factors. Students will apply formulas to analyze the operation of AC circuits.

Prerequisites: Consent of Instructor

Corequisite: EET 107

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Determine physical and electrical characteristics of capacitors and inductors

2 Analyze, construct and troubleshoot time constant circuits

3 Use an oscilloscope to verify properties of AC signals

4 Use an oscilloscope to measure voltages, phases and frequencies

5 Analyze, construct and troubleshoot series capacitive circuits

6 Analyze, construct and troubleshoot parallel capacitive circuits

7 Calculate and measure phase shift to RC and RL networks

8 Design, build and measure frequency response of filters

9 Analyze, construct and troubleshoot series inductive networks

10 Analyze, construct and troubleshoot parallel inductive networks

11 Determine physical and electrical characteristics of transformers and test

12 Plot frequency response of RLC networks

13 Determine the effect of Q on frequency response and band width

14 Compute and measure power in AC circuits

15 Analyze, construct and troubleshoot RCL circuits

Program **ELECTRICAL TECHNOLOGY**

EET 107 **ALTERNATING CURRENT CIRCUITS LAB** **Credit** **2.0**

90 Hours

Course Description

The alternating current circuits lab course allows the student to verify AC theory by making measurements in working AC circuits. Various types of AC circuits are constructed and their parameters are measured. The use of test equipment and trouble shooting are stressed. Measured circuit parameters are

Prerequisites: Consent of Instructor

Corequisite: EET 106

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 106

Program **ELECTRICAL TECHNOLOGY**

EET 108 **ELECTRICAL CIRCUIT ANALYSIS** **Credit** **6.0**

90 Hours

Course Description

This course introduces the theory of electricity and magnetism, and the relationship of voltage, current, resistance, and power in electrical circuits. The course is designed to develop an understanding of alternating and direct current fundamentals. Students will apply formulas to analyze the operation of AC

Prerequisites: Consent of Instructor

Corequisite: EET 109

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Apply shop and electrical safety practices
2	Identify and use basic hand tools
3	Care for and maintain hand tools
4	Solder/desolder electrical connections
5	Operate power supplies
6	Compute, measure, and identify conductance and resistance of conductors and insulators
7	Measure properties of a circuit using VOM and DVM meters
8	Solve electrical circuit problems using Ohm's Law
9	Analyze, construct and troubleshoot parallel circuits
10	Analyze, construct and troubleshoot series circuits
11	Analyze, construct and troubleshoot series-parallel circuits
12	Analyze basic motors, generator theory and operation
13	Use network theorems to build and analyze complex circuits
14	Analyze, construct and troubleshoot maximum power transfer circuits
15	Analyze, construct and troubleshoot time constant circuits
16	Determine physical and electrical characteristics of capacitors and inductors
17	Analyze, construct and troubleshoot time constant circuits
18	Use an oscilloscope to verify properties of an AC signal
19	Use an oscilloscope to measure voltages, phases and frequencies
20	Analyze, construct and troubleshoot series capacitive circuits

21 Analyze, construct and troubleshoot parallel capacitive circuits

22 Calculate and measure phase shift to RC and RL networks

23 Design, build and measure frequency response of filters

24 Analyze, construct and troubleshoot series inductive networks

25 Analyze, construct and troubleshoot parallel inductive networks

26 Determine physical and electrical characteristics of transformers and test procedures

27 Plot frequency response of RLC networks

28 Determine the effect of Q on frequency responses and band widths

29 Compute and measure power in AC circuits

30 Analyze, construct and troubleshoot RCL circuits

Program **ELECTRICAL TECHNOLOGY**

EET 109 **ELECTRICAL CIRCUIT ANALYSIS LAB** **Credit** **4.0**

180 Hours

Course Description

This AC and DC lab course allows the student to verify basic theory by making measurments in working AC and DC circuits. Various types of circuits are constructed and their parameters measured. The use of test equipment, safety, and troubleshooting are stressed.

Prerequisites: Consent of Instructor

Corequisite: EET 108

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 108

Program **ELECTRICAL TECHNOLOGY**

EET 110 **DEVICES AND CIRCUITS I** **Credit** **3.0**

45 Hours

Course Description

This course combines theory and application in the study of semiconductor devices including: diodes, Zener diodes, bipolar junction transistors, field effect transistors, and circuits involved.

Prerequisites: Consent of Instructor, EET 106

Corequisite: EET 111

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Apply safe handling practices to solid state devices
2	Identify different diode packages and how to test them with an ohmmeter
3	Design, build, and test Zener regulator circuits
4	Identify different transistor packages and C-B-E leads on any package
5	Remove and install transistors
6	Use voltage analysis to identify transistor circuits and locate defective components
7	Use ohmmeter and transistor tester to identify defective transistors
8	Measure amplifier voltage gain with an oscilloscope
9	Build and analyze operation for FET circuits
10	Construct and test the operation and application of circuits using photoelectronic devices
11	Measure power supply ripple and regulation with an oscilloscope
12	Identify and troubleshoot regulator networks
13	Use ohmmeter, voltmeter, and oscilloscope to troubleshoot and repair power supplies
14	Design and build voltage multiplier circuits
15	Explain the operation of electronic power supplies
16	Calculate input impedance and bias voltages of transistors and transistor amplifiers
17	Identify amplifiers by class from a schematic diagram
18	Identify and explain thermal feedback loops
19	Identify and test Darlington amplifiers
20	Measure frequency response in amplifiers

21 Test volume and tone control circuits

22 Adjust and explain how to tune and neutralize output circuits

Program **ELECTRICAL TECHNOLOGY**

EET 111 **DEVICES AND CIRCUITS I LAB** **Credit** **2.0**

90 Hours

Course Description

Practical lab applications of circuits using diodes, bipolar junction transistors, and field effect transistors.

Prerequisites: Consent of Instructor; EET 107

Corequisite: EET 110

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 110

Program **ELECTRICAL TECHNOLOGY**

EET 112 **DEVICES AND CIRCUITS II** **Credit** **3.0**

45 Hours

Course Description

Combines theory and applications in the study of operational amplifiers, oscillators, basic modulation circuitry, linear integrated circuits, thyristors, and regulated/switching power supplies.

Prerequisites: Consent of Instructor; EET 110

Corequisite: EET 113

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Identify and troubleshoot regulator networks
2	Use ohmmeter, voltmeter, and oscilloscope to troubleshoot and repair power supplies
3	Design, construct, and test regulated power supplies
4	Test and repair switching power supplies
5	Identify and test Darlington amplifiers
6	Measure frequency response in amplifiers
7	Test volume and tone control circuits
8	Adjust and explain how to tune and neutralize output circuits
9	Recognize schematic representation of differential and summing amplifiers, comparators, filters, and voltage followers
10	Calculate and measure op-amp gain
11	Identify and test rectifier circuits
12	Identify equalization networks and filters
13	Identify the basic types of oscillators
14	Use an oscilloscope, voltmeter, and frequency counter to verify operation of oscillators
15	Identify and test the operation of pulse shaping networks
16	Build and test 555 based timer
17	Build a transistor sawtooth generator
18	Test the operation of clippers, clampers and slicers
19	Construct and test circuits using linear ICs
20	Measure circuits using precision instruments

21 Select ICs for design or replacement using data sheets

22 Explain test instrument limitations

23 Explain operation and applications of the SCR, bidirectional thyristor, trigger diode, unijunction transistor and PUT

24 Investigate the operation of unijunction transistors and SCR's

Program **ELECTRICAL TECHNOLOGY**

EET 113 **DEVICES AND CIRCUITS II LAB** **Credit** **2.0**

90 Hours

Course Description

Practical lab applications of circuits using operational amplifiers, oscillators, basic modulation circuitry, linear integrated circuits, thyristors, and regulated/switching power supplies.

Prerequisites: Consent of Instructors; EET 111

Corequisite: EET 112

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 112

Program **ELECTRICAL TECHNOLOGY**

EET 114 **ELECTRONIC DEVICES AND CIRCUITS** **Credit** **6.0**

90 Hours

Course Description

This course combines theory and application in the study of semiconductor devices including diodes, Zener diodes, bipolar junction transistors, field effect transistors, and the circuits involved. Combines theory and application in the study of operational amplifiers, oscillators, basic modulation circuitry, linear integrated circuits, thyristors, and regulated/switching power supplies.

Prerequisites: Consent of Instructor; EET 108

Corequisite: EET 115

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Apply safe handling practices to solid state devices
2	Identify different diode packages and how to test them with an ohmmeter
3	Design, build, and test Zener regulator circuits
4	Identify different transistor packages and C-B-E leads on any package
5	Remove and install transistors
6	Use voltage analysis to identify transistor circuits and locate defective components
7	Use ohmmeter and transistor tester to identify defective transistors
8	Measure amplifier voltage gain with an oscilloscope
9	Build and analyze operation of FET circuits
10	Construct and test the operation and application of circuits using photoelectronic devices
11	Measure power supply ripple and regulation with an oscilloscope
12	Identify and troubleshoot regulator networks
13	Use ohmmeter, voltmeter, and oscilloscope to troubleshoot and repair power supplies
14	Design and build voltage multiplier circuits
15	Explain the operation of electronic power supplies
16	Calculate input impedance and bias voltages of transistors and transistor amplifiers
17	Identify amplifiers by class from a schematic diagram
18	Identify and explain thermal feedback loops
19	Identify and test Darlington amplifiers
20	Measure frequency response in amplifiers

21 Use ohmmeter, voltmeter, and oscilloscope to troubleshoot and repair power supplies

22 Design, construct, and test regulated power supplies

23 Test and repair switching power supplies

24 Adjust and explain how to tune and neutralize output circuits

25 Recognize schematic representation of differential and summing amplifiers, comparators, filters, and voltage followers

26 Calculate and measure op-amp gain

27 Identify and test rectifier circuits

28 Identify equalization networks and filters

29 Identify the basic types of oscillators

30 Use an oscilloscope, voltmeter, and frequency counter to verify operation of oscillators

31 Identify and test the operation of pulse shaping networks

32 Build and test 555 based timer

33 Build a transistor sawtooth generator

34 Construct and test circuits using linear ICs

35 Measure circuits using precision instruments

36 Select ICs for design or replacement using data sheets

37 Explain test instrument limitations

38 Explain operation and applications of the SCR, bidirectional thyristor, trigger diode, unijunction transistor and PUT

Program **ELECTRICAL TECHNOLOGY**

EET 115 **ELECTRONIC DEVICES AND CIRCUITS LAB** **Credit** **4.0**

180 Hours

Course Description

Practical lab applications of circuits using diodes, bipolar junction transistors, and field effect transistors. Practical lab applications of circuits using operational amplifiers, oscillators, basic modulation circuitry, linear integrated circuits, thyristors, and regulated/switching power supplies.

Prerequisites: Consent of Instructor or EET 108, EET 109

Corequisite: EET 114

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 114

Program **ELECTRICAL TECHNOLOGY**

EET 116 **WEB PAGE DESIGN** **Credit** **3.0**

45 Hours

Course Description

Web page design is the study of page design for the Internet. It focuses on principles of design, language, structure, and restrictions of an Internet Web page.

Prerequisite: Consent of Instructor

Corequisite: EET 117

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Identify concepts and vocabulary
2	Identify design principles for the Internet
3	Define story boarding
4	Identify tags
5	Define HTML
6	Discuss HTML editing
7	Define creation, organization, and navigation of links
8	Define how to use images
9	Identify browser restrictions
10	Discuss software programs used for web page design
11	Discuss frames
12	Discuss Java
13	Define external media: images, sound, and video
14	Define VRML
15	Identify Internet etiquette
16	Identify safety rules applicable to the Internet

Program **ELECTRICAL TECHNOLOGY**

EET 117 **WEB PAGE DESIGN LAB** **Credit** **1.0**

45 Hours

Course Description

In this course, students will apply the principles of design, language, structure, and restrictions in the production of a Internet web page.

Prerequisite: Consent of Instructor

Corequisite: EET 116

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1	Apply design principles for the Internet
2	Create story boards
3	Use tags
4	Create HTML documents
5	Edit HTML documents
6	Create, organize, and navigate links
7	Import images
8	Use various Internet browsers
9	Use various web page design software programs
10	Create a web page using frames
11	Create a web page using Java
12	Apply external media: images, sound, and video
13	Apply Internet etiquette
14	Apply safety rules applicable to the Internet

Program **ELECTRICAL TECHNOLOGY**

EET 118 **INTERNET APPLICATIONS FOR COMPUTER SERVICING** **Credit** **3.0**

45 Hours

Course Description

Internet Applications for Computer Servicing develops skills in using the Internet as it relates to computer repair and servicing personnel. Using tools and capabilities of the Internet to research, communicate, and find relevent information. Organizing and placing information Intranets within

Prerequisites: Consent of Instructor

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Define Internet

2 Define Intranet

3 Identify and define the kinds of Internet providers and connections

4 Define terms related to the World Wide Web (WWW)

5 Identify World Wide Web browsers and their capabilities

6 Identify World Wide Web search engines and their capabilities

7 Describe the uses and functions of the Internet as a communications tool

8 Describe the uses and functions of the Internet as a place to search for information

9 Identify classroom hardware and software used to access the Internet

10 Describe and use Netiquette

11 Evaluate the usefulness of Internet information related to computer repair

12 Read and discuss trends and emerging technologies related to the World Wide Web

13 Compare the similarities and differences of the Internet and Intranets

14 Conduct searches for BIOS upgrades and software drivers using the Internet

Program **ELECTRICAL TECHNOLOGY**

EET 148 **ELECTRONIC DRAFTING** **Credit** **3.0**

45 Hours

Course Description

Presents drafting techniques applicable to electronics equipment, and provides a review of electrical/electronic symbols and the devices that the symbols represent. Layout and drafting for printed circuits are stressed. The focus is on producing final drawings from engineering sketches and from the actual layout of printed circuit boards.

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	List the materials and tools used for electronic drafting and describe the function of each
2	List the eight major types of electronic drawings and explain how each is used
3	Explain the three functions of block diagrams
4	Draw, in pencil, two block diagrams using dense, uniform, and unbroken lines, following the rules for good layout
5	Identify and draw the most commonly used electronic parts and symbols
6	Identify the correct reference designator for each electronic symbol
7	Give the ten basic rules for the correct layout of component symbols and conducting lines
8	Layout correctly, draw and letter, in pencil, schematic diagrams from rough sketches, and assign reference designator
9	Draw a logic diagram from a sketch and apply the correct symbols for logic gates and apply the rules for correct layout of symbols and conducting lines
10	Draw, to industrial standards, a highway diagram from a point to point wiring sketch
11	List three ways a point to point interconnecting diagram is different from a highway diagram
12	Describe the basic function of a printed circuit
13	Name three types of printed circuit boards and three types of drawings which must be used to build a printed circuit board
14	List the five steps in manufacturing a printed circuit board
15	Design layouts for discrete component PC boards and integratged circuit boards
16	Draw the artwork from design layout drawings and produce a drill plan from printed circuit artwork

Program **ELECTRICAL TECHNOLOGY**

EET 150 **TRANSFORMERS** **Credit** **2.0**

30 Hours

Course Description

Study of the operation and installation of AC single phase and three phase transformers.

Prerequisites: Consent of Instructor or EET 108

Corequisite: EET 151

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Connect a dual voltage transformer for its highest input and output voltages
2	Connect a dual voltage transformer for the low voltage input and output
3	Connect an ammeter to high voltage line using a current transformer
4	Connect an auto transformer to give a variety of voltages
5	Connect transformers to supply 3-phase power, 4-2 configuration
6	Connect transformers to supply 3-phase power, delta configuration
7	Connect transformers to supply 3-phase power, Y configuration
8	Connect the secondary of a 3-phase bank to give a 4-wire delta system
9	Connect 3-single phase transformers to form a delta-delta configuration
10	Connect 3-single phase transformers to form a delta-star configuration
11	Connect 3-single phase transformers to form a star-delta 3-phase
12	Connect 3-single phase transformers to form a star-star 3-phase bank
13	Connect 2 single-phase transformers in an open-delta configuration
14	Connect 2 single-phase transformers in parallel
15	Connect a voltmeter using a potential transformer to determine voltage
16	Test transformer for output and performance under resistive, capacitive, and inductive loads
17	Connect buck-boost transformer to increase voltage
18	Connect buck-boost transformer to decrease voltage

Program **ELECTRICAL TECHNOLOGY**

EET 151 **TRANSFORMERS LAB** **Credit** **1.0**

45 Hours

Course Description

Experiences in the actual connecting and operating of single phase and three-phase transformers.

Corequisite: EET 150

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 150

Program **ELECTRICAL TECHNOLOGY**

EET 152 **ELECTRICAL DRAFTING** **Credit** **2.0**

30 Hours

Course Description

The course provides lectures, demonstrations and practice exercises in the study of electrical symbols, views, sections, and details commonly found in electrical drawings.

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Draw electrical symbols
2	Draw floor plan
3	Draw diagrams of electronic circuits using solid state devices
4	Draw elecrical diagrams of printed circuit boards
5	Draw control panel diagrams
6	Draw external power diagrams
7	Draw schematic diagrams from pre-wired circuits
8	Update schematic print files for machinery

Program **ELECTRICAL TECHNOLOGY**

EET 154 **ELECTRICAL CONSTRUCTION I** **Credit** **2.0**

30 Hours

Course Description

Involves the study of materials and procedures used in construction wiring. Lecture: 2 hours per week

Corequisite: EET 155

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Install circuits using non-metallic sheathed cable
2	Install and connect branch circuit grounding
3	Install power feeder wiring system to equipment
4	Install conductors in conduit or raceway and terminate
5	Install underground cable
6	Install wire terminals and lugs
7	Make splices using approved methods
8	Install flexible and liquid tight conduit
9	Install electrical metallic tubing
10	Install temporary service
11	Install main distribution panel
12	Install, identify, and label circuit breakers, fuses, and fuse adapters in distribution panels
13	Install underground and overhead service entrances
14	Test circuits for proper operation
15	Inventory equipment, materials and supplies
16	Complete an accident or incident report
17	Install lighting dimmer systems
18	Mark location of switches and outlets on studding
19	Locate room center for ceiling outlets
20	Mark location of single system components

Program **ELECTRICAL TECHNOLOGY**

EET 154 **ELECTRICAL CONSTRUCTION I** **Credit** **2.0**

30 Hours

21	Layout and install single and ganged boxes both flush and surface mounted (new construction)
22	Layout and install ganged boxes both flush and surface mounted (old construction)
23	Install switches - single pole, three-way, four-way
24	Install duplex and special purpose receptacles
25	Install lighting fixtures (incandescent, electrical discharged, recessed and surfaced)
26	Install door chime, switches, and transformer
27	Test emergency lighting system
28	Connect automatic garage door opener
29	Install overhead fan or fanlight with controls
30	Connect or troubleshoot water heaters
31	Install single-phase dual voltage motors
32	Connect combination heating-cooling unit
33	Connect ceiling or wall heating panel
34	Install baseboard heating unit
35	Install line and low voltage thermostats
36	Install radio, TV, and telephone outlets
37	Compile a bill of materials from wiring diagrams drawn to specifications
38	Draw wiring diagrams to specifications
39	Estimate total cost of a specific installation

Program **ELECTRICAL TECHNOLOGY**

EET 155 **ELECTRICAL CONSTRUCTION I LAB** **Credit** **2.0**

90 Hours

Course Description

Designed to give hand-on experiences with electrical materials and equipment in construction wiring.
Laboratory: 6 hours per week
Corequisite: EET 154

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 154

Program **ELECTRICAL TECHNOLOGY**

EET 160 **MATHEMATICS FOR ELECTRONICS/ELECTRICITY** **Credit** **5.0**

75 Hours

Course Description

This course includes the study of algebraic techniques which include signed numbers, scientific notations, exponents, algebraic expressions, and linear equations as they apply electricity and electronics.

The concepts of solutions for right angle trigonometry utilizing angles and sides, Pythagorean Therom, trigonometric functions, and the solution of right triangles are included. The concepts of phasor algebra are also developed. The students will investigate and apply exponent and logarithmic functions.

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Perform operations with signed numbers

2 Demonstrate a knowledge of powers of 10, scientific notation, units and prefixes as needed for electricity and electronics

3 Demonstrate a knowledge of properties of numbers

4 Explain and apply the laws of exponents

5 Demonstrate a knowledge of four function math of algebraic expressions as needed for electricity and electronics

6 Perform operations with linear equations, graphing, transposing, as needed for electricity and electronics

7 Explain, demonstrate and apply knowledge of systems of equations, methods of solutions, determinants, as needed for electricity and electronics

8 Apply basic concepts of right angle trigonometry

9 Perform operations involving right angle trigonometry-angles and sides-Pythagorean theorem-trigonometric functions-solve right triangles, as needed for electricity and electronics

10 Utilize phasor algebra-rectangular and polar coordinate systems

11 Utilize logarithms

12 Apply concepts of logarithms

Program **ELECTRICAL TECHNOLOGY**

EET 198 **PRACTICUM** **Credit** **2.0**

150 Hours

Course Description

The practicum provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Practicum Education program do not receive compensation for

Prerequisites: Consent of Instructor

Lecture: **No** Lab: **No** Experience: **Yes**

TASK LIST

1 Gain career awareness and the opportunity to test career choice(s)

2 Receive work experience related to career interests prior to graduation

3 Integrate classroom studies with work experience

4 Receive exposure to facilities and equipment unavailable in a classroom setting

5 Enhance employability

Program **ELECTRICAL TECHNOLOGY**

EET 199 **COOPERATIVE EDUCATION PROGRAM** **Credit** **2.0**

150 Hours

Course Description

Co-op provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Cooperative Education program receive compensation for their work.

Prerequisites: Consent of Instructor

Lecture: **No** Lab: **No** Experience: **Yes**

TASK LIST

1 Gain career awareness and the opportunity to test career choice(s)

2 Receive work experience related to career interests prior to graduation

3 Integrate classroom studies with work experience

4 Receive exposure to facilities and equipment unavailable in a classroom setting

5 Enhance employability

6 Earn funds to help finance education expenses

Program **ELECTRICAL TECHNOLOGY**

EET 200 **DIGITAL ELECTRONICS** **Credit** **3.0**

45 Hours

Course Description

Develops an understanding of fundamental digital principles including logic gates, Boolean algebra, flip-flops, register, combinational and sequential logic circuits and basic digital design techniques.

Prerequisites: Consent of Instructor or EET 112

Corequisite: EET 201

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Identify and verify logic functions

2 Use Boolean algebra to simplify logic circuits

3 Construct, test, and verify practical logic circuits

4 Construct, test, and verify counters

5 Construct, test, and verify registers

6 Construct, test, and verify decoders

7 Construct, test, and verify encoders

8 Construct, test, and verify convertors

9 Construct, test, and verify adders

10 Construct, test, and verify subtractors

Program **ELECTRICAL TECHNOLOGY**

EET 201 **DIGITAL ELECTRONICS LAB** **Credit** **2.0**

90 Hours

Course Description

Developes an understanding of fundamental digital principles including logic gates, Boolean algebra, flip-flops, register, combinational and sequential logic circuits and basic digital design techniques.

Prerequisites: Consent of Instructor or EETS 112

Corequisite: EET 200

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 200

Program **ELECTRICAL TECHNOLOGY**

EET 202 **MICROPROCESSORS** **Credit** **3.0**

45 Hours

Course Description

This microprocessor class is designed to develop an understanding of microprocessor theory and operation, computer arithmetic, assembly language programs for different microprocessors. These programs will use various addressing modes and interrupt service routines. The application of microprocessors in industrial electronics is stressed throughout this course.

Prerequisites: Consent of Instructor or EET 200

Corequisite: EET 203

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Draw a block diagram of a microprocessor
2	Write simple straight line programs
3	Perform arithmetic and logic operations on binary numbers
4	Develop flow charts
5	Write and execute a program containing branch instruction
6	Write and execute a program illustrating multi-byte arithmetic
7	Write and execute a program using extended and index addressing
8	Load and execute a memory block move program
9	Demonstrate reset and interrupt sequences
10	Interface and access memory
11	Interface to display devices
12	Interface a keyboard to a microprocessor
13	Utilize a peripheral interface adapter to interface standard devices
14	Apply A/D and D/A conversion techniques for signal conversion

Program **ELECTRICAL TECHNOLOGY**

EET 203 **MICROPROCESSORS LAB** **Credit** **2.0**

90 Hours

Course Description

The microprocessor lab is designed to allow the student to develop an understanding of microprocessor theory and operation and computer logic functions, by programming typical microprocessors and using different interfacing techniques.

Prerequisites: Consent of Instructor or EET 201

Corequisite: EET 202

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 202

Program **ELECTRICAL TECHNOLOGY**

EET 204 **DIGITAL SYSTEMS AND MICROPROCESSORS** **Credit** **6.0**

90 Hours

Course Description

Develops an understanding of fundamental digital principles including logic gates, Boolean algebra, flip-flops, registar, combinational and sequential logic circuits and basic digital design techniques. The microprocessor segment of the class is designed to develop an understanding of microprocessor theory and operation, computer arithmetic, and assembly language programs for different microprocessors. These programs will use various addressing modes and interrupt service routines. The application of microprocessors in industrial settings is stressed throughout this course.

Prerequisites: Consent of Instructor or EET 114
Corequisite: EET 205
Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Identify and verify logic functions
2	Use Boolean algebra to simplify logic circuits
3	Construct, test, and verify practical logic circuits
4	Construct, test, and verify counters
5	Construct, test, and verify registers
6	Construct, test, and verify encoders and decoders
7	Construct, test, and verify convertors
8	Construct, test, and verify adders and subtractors
9	Draw a block diagram of a microprocessor
10	Write simple straight line programs
11	Perform arithmetic and logic operations on binary numbers
12	Develop flow charts
13	Write and execute a program containing branch instruction
14	Write and execute a program illustrating multi-byte arithmetic
15	Write and execute a program using extended and index addressing
16	Load and execute a memory block move program
17	Demonstrate reset and interrupt sequences
18	Interface and access memory
19	Interface to display devices

20 Interface a keyboard to a microprocessor

21 Utilize a peripheral interface adapter to interface standard devices

22 Apply A/D and D/A conversion techniques for signal conversion

Program **ELECTRICAL TECHNOLOGY**

EET 205 **DIGITAL SYSTEMS AND MICROPROCESSORS LAB** **Credit** **4.0**

180 Hours

Course Description

Includes practical lab applications that allow the student to construct and analyze basic digital circuits using digital principles and concepts. The microprocessor segment of the lab is designed to allow the student to develop an understanding of microprocessor theory and operation and computer logic functions by programming typical microprocessors and using different interfacing techniques.

Prerequisites: Consent of Instructor or EET 115

Corequisite: EET 204

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 204

Program **ELECTRICAL TECHNOLOGY**

EET 206 **ELECTRONIC COMMUNICATIONS FUNDAMENTALS** **Credit** **3.0**

45 Hours

Course Description

Introduces basic theory of AM and FM. Basic principles of AM and PM transmitters, antennas and receivers are studied. Basic principles of fiber optic communications are covered. The block diagram and basic circuits of transmitters and receivers are studied as well as basic troubleshooting techniques using meter, oscilloscope, signal generators and analyzers.

Prerequisites: Consent of Instructor

Corequisitie: EET 207

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Analyze and verify high and low level AM modulation techniques
2	Analyze and verify methods of obtaining SSB signals
3	Analyze and verify methods of obtaining FM and PM signals
4	Analyze and verify methods of recovering the intelligence contained in received AM, SSB and FM signals
5	Analyze frequency synthesizers which use a programmable divider, phase-locked loop, and voltage controlled oscillator
6	Analyze, align and troubleshoot AM, SSB, and FM receivers
7	Analyze, align and adjust FM stereo receivers
8	Analyze the propagation characteristics of radio transmissions at various frequencies
9	Determine the effective rediated power of a transmission system
10	Analyze the characteristics of horizontally and vertically polarized RF signals
11	Analyze the characteristics of directional and omni-directional antenna systems
12	Calculate and verify the wavelength within the transmission line when the line's velocity constant is known
13	Demonstrate the operation of frequency division multiplexing transmitter and RCVR circuits
14	Demonstrate pulse signals and amplitude modulation techniques
15	Demonstrate time division multiplexing of PAM signals

Program **ELECTRICAL TECHNOLOGY**

EET 207 **ELECTRONIC COMMUNICATIONS FUNDAMENTALS LAB** **Credit** **2.0**

90 Hours

Course Description

Students are able to verify theory by analysis and measurements in AM, FM, SSB, and various digital communications techniques.

Prerequisites: Consent of Instructor

Corequisite: EET 206

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 206

Program **ELECTRICAL TECHNOLOGY**

EET 208 **ELECTRONIC COMMUNICATIONS I** **Credit** **3.0**

45 Hours

Course Description

Provides the theory of AM and FM, RF communications transmission and reception.

Prerequisites: Consent of Instructor or EET 202

Corequisite: EET 209

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Analyze and verify high and low level AM modulation techniques
2	Analyze and verify methods of obtaining SSB signals
3	Analyze and verify methods of obtaining FM and PM signals
4	Analyze and verify methods of recovering the intelligence contained in received AM, SSB and FM signals
5	Calculate and measure the oscillator frequency required to produce a desired narrow band FM transmitter output frequency
6	Analyze frequency synthesizers which use a programmable divider, phase-locked loop and voltage controlled oscillator
7	Analyze, align and troubleshoot dual conversion AM, SSB and FM receivers
8	Analyze, align and troubleshoot FM stereo receivers
9	Calculate and measure the input and output power of transmitters
10	Analyze, align and troubleshoot to the component level multifrequency AM, SSB and FM transceivers
11	Analyze transceiver input impedance matching networks
12	Analyze the operation of transceiver switching circuits
13	Perform 20-dB quieting tests on FM receivers
14	Analyze the operation of CTCSS systems
15	Analyze the operation of repeater stations
16	Analyze the interfacing of radio equipment to telephone lines
17	Calculate the characteristics impedance of various types of transmission line
18	Calculate and verify the wavelength within the transmission line when the line's velocity constant is known
19	Calculate VSWR for various impedance loads
20	Calculate the input power to antennae

21 Analyze the characteristics of vertically and horizontally polarized RF signals

22 Analyze the characteristics of directional and omni-directional antennae systems

23 Determine the effective radiated power of a transmission system

24 Analyze the propagation characteristics of radio transmissions at various frequencies

25 Use various analyzers, meters, wattmeters, monitors, counters, and bridges used in electronics communication

26 Identify the components of a basic video system

27 Analyze the components of a composite video signal

Program **ELECTRICAL TECHNOLOGY**

EET 209 **ELECTRONIC COMMUNICATIONS I LAB** **Credit** **2.0**

90 Hours

Course Description

Students are able to verify theory by analysis and measurements in AM, FM and SSB communications

Prerequisites: Consent of Instructor or EET 203

Corequisite: EET 208

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 208

Program **ELECTRICAL TECHNOLOGY**

EET 210 **ELECTRONIC COMMUNICATIONS II** **Credit** **3.0**

45 Hours

Course Description

Provides the theory of multiplexing transmission lines, antennas, microwaves, satellite, data communications, fiber optic and modern communication applications.

Prerequisites: Consent of Instructor or EET 208

Corequisite: EET 211

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Demonstrate the operation of frequency division multiplexing transmitter and RCVR circuits
2	Demonstrate the operation of FDM and QM baseband signals using spectrum analyzer
3	Demonstrate pulse signals and amplitude modulation techniques
4	Demonstrate time duration multiplexing of PAM signals
5	Analyze the operation of PTM, PWM, PPM and effects of noise
6	Demonstrate PCM encoder sampling process, PCM decoder, serial to parallel conversion and PCM filter of coder operations
7	Demonstrate CODEC slot programmer circuit operations and evaluate effects of noise of PCM systems
8	Demonstrate delta modulation decoding
9	Identify and apply the encoding and decoding process of CODEC 1 and 2 circuits and the effects of noise on delta modulation systems
10	Analyze and verify techniques of encoding and decoding NRZ and RZ and Manchester data signals
11	Demonstrate FSK signal generation and detection
12	Demonstrate ASK and PSK signal generation and detection
13	Demonstate the operation of the carrier synchronizer for generation and detection of ASK and PSK signals
14	Demonstrate the use of MODEM

Program **ELECTRICAL TECHNOLOGY**

EET 211 **ELECTRONIC COMMUNICATIONS II LAB** **Credit** **2.0**

90 Hours

Course Description

Allows the student to verify theory, by analysis and measurements in receiving, transmitting and conditioning circuity used in communications.

Prerequisite: Consent of Instructor or EET 209

Corequisite: EET 210

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 210

Program **ELECTRICAL TECHNOLOGY**

EET 212 **ELECTRONIC COMMUNICATIONS** **Credit** **6.0**

90 Hours

Course Description

This course provides the theory of AM & FM, RF communications, transmission, reception, multiplexing, and modern data communications.

Prerequisites: Consent of Instructor or EET 204

Corequisite: EET 213

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Analyze and verify high and low level AM modulation techniques
2	Analyze and verify methods of obtaining SSB signals
3	Analyze and verify methods of obtaining FM and PM signals
4	Analyze and verify methods of recovering the intelligence contained in received AM, SSB and FM signals
5	Calculate and measure the oscillator frequency required to produce a desired narrow band FM transmitter output frequency
6	Analyze frequency synthesizers which use a programmable divider, phase-locked loop and voltage controlled oscillator
7	Analyze, align and troubleshoot dual conversion AM, SSB and FM receivers
8	Analyze, align and troubleshoot FM stereo receivers
9	Calculate and measure the input and output power of transmitters
10	Analyze, align and troubleshoot to the component level multifrequency AM, SSB and FM transceivers
11	Analyze transceiver input impedance matching networks
12	Analyze the operation of transceiver switching circuits
13	Perform 20-dB quieting tests on FM receivers
14	Analyze the operation of CTCSS systems
15	Analyze the operation of repeater stations
16	Analyze the interfacing of radio equipment to telephone lines
17	Calculate the characteristics impedance of various types of transmission line
18	Calculate and verify the wavelength within the transmission line when the line's velocity constant is known
19	Calculate VSWR for various impedance loads
20	Calculate the input power to antennae

21 Analyze the characteristics of vertically and horizontally polarized RF signals

22 Analyze the characteristics of directional and omni-directional antennae systems

23 Determine the effective radiated power of a transmission system

24 Analyze the propagation characteristics of radio transmissions at various frequencies

25 Demonstrate the operation and use of spectrum analyzers, waveform monitors, reflectometers, thruline wattmeters, termination wattmeters

26 Demonstrate the operation and use of communications service monitors, modulation monitors, deviation meters, frequency counters and impedance bridges

27 Identify the components of a basic video system

28 Analyze the components of a composite video signal

29 Demonstrate the operation of frequency division multiplexing transmitter and RCVR circuits

30 Demonstrate the operation of FDM and QM baseband signals using spectrum analyzer

31 Demonstrate pulse signals and amplitude modulation techniques

32 Demonstrate time duration multiplexing of PAM signals

33 Analyze the operation of PTM, PWM, PPM and effects of noise

34 Demonstrate PCM encoder sampling process, PCM decoder, serial to parallel conversion and PCM filtering of coder operations

35 Demonstrate CODEC slot programmer circuit operations and evaluate effects of noise on PCM systems

36 Demonstrate delta modulation decoding

37 Identify and apply the encoding and decoding process of CODEC 1 and 2 circuits and the effects of noise on delta modulation systems

38 Analyze and verify techniques of encoding and decoding NRZ and RZ and Manchester data signals

39 Demonstrate FSK signal generation and detection

40 Demonstrate ASK and PSK signal generation and detection

41 Demonstrate the operation of the carrier synchronizer for generation and detection of ASK and PSK signals

42 Demonstrate the use of a MODEM

Program **ELECTRICAL TECHNOLOGY**

EET 213 **ELECTRONIC COMMUNICATIONS LAB** **Credit** **4.0**

180 Hours

Course Description

This course allows the student to verify AM, FM and RF communications theories through the analysis and measurement of receiving, transmitting and conditioning circuitry used in analog and digital communications equipment.

Prerequisites: Consent of Instructor or EET 205

Corequisite: EET 212

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 212

Program **ELECTRICAL TECHNOLOGY**

EET 214 **TELEVISION AND RADIO SYSTEMS** **Credit** **6.0**

90 Hours

Course Description

This course introduces basic theory of AM and FM. Basic principles of AM and FM transmitters, antennas and receivers are studied. Basic principles of fiber optic communications are covered. The block diagram and basic circuits of transmitters and receivers are studied as well as basic trouble-shooting techniques using meter, oscilloscope, signal generators and analyzers. This course also introduces basic television theory, basic principles of audio and video recording. The block diagram and basic circuits of consumer radios, stereos, TV receivers and VCRs are studied. Training will be given in basic troubleshooting techniques using meters, an oscilloscope, signal generators and analyzers.

Prerequisites: Consent of Instructor
Corequisite: EET 215
Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Analyze and verify high and low level AM modulation techniques
2	Analyze and verify methods of obtaining SSB signals
3	Analyze and verify methods of obtaining FM and PM signals
4	Analyze and verify methods of recovering the intelligence contained in received AM, SSB and FM signals
5	Analyze frequency synthesizers which use a programmable divider, phase-locked loop, and voltage controlled oscillator
6	Analyze, align and troubleshoot AM, SSB, and FM receivers
7	Analyze, align and adjust FM stereo receivers
8	Analyze the propagation characteristics of radio transmissions at various frequencies
9	Determine the effective radiated power of a transmission system
10	Analyze the characteristics of horizontally and vertically polarized RF signals
11	Analyze the characteristics of directional and omni-directional antenna systems
12	Calculate and verify the wavelength within the transmission line when the line's velocity constant is known
13	Demonstrate the operation of frequency division multiplexing transmitter and RCVR circuits
14	Demonstrate pulse signals and amplitude modulation techniques
15	Demonstrate time division multiplexing of PAM signals
16	Analyze the components of a composite video signal
17	Identify components of a television block diagram
18	Identify defective block by symptom diagnosis

19 Troubleshoot television low voltage power supply

20 Troubleshoot television video processing circuits

21 Troubleshoot television audio processing circuits

22 Check and adjust all customer controls

23 Identify components of a VCR block diagram

24 Identify defective blocks of a VCR by system diagnosis

25 Clean VCR heads and tape path

26 Identify mechanical components of a VCR

27 Check and replace video heads

28 Clean and align tape player head

29 Check and replace audio tape player head

Program **ELECTRICAL TECHNOLOGY**

EET 215 **TELEVISION AND RADIO SYSTEMS LAB** **Credit** **4.0**

180 Hours

Course Description

Students are able to verify theory by analysis and measurements in AM, FM, SSB, TV circuitry and various digital communications techniques.

Prerequisites: Consent of Instructor

Corequisite: EET 214

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 214

Program **ELECTRICAL TECHNOLOGY**

EET 216 **COMPUTER ELECTRONICS FUNDAMENTALS** **Credit** **3.0**

45 Hours

Course Description

Introduces the fundamentals of computers and computer systems. Students will use diagnostic software, as well as, windows and DOS. Layout of the basic computer system and peripherals are studied. Basic troubleshooting techniques are introduced using meters, an oscilloscope, logic probes and diagnostics.

Prerequisites: Consent of Instructor or EET 217

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Explain each major section of a computer system

2 Operate DOS System

3 Check disk drive interface signals

4 Analyze memory and memory interfacing

5 Troubleshoot and repair peripheral devices

6 Load and run diagnostic programs

Program **ELECTRICAL TECHNOLOGY**

EET 217 **COMPUTER ELECTRONICS FUNDAMENTALS LAB** **Credit** **2.0**

90 Hours

Course Description

This computer electronics fundamentals lab is designed to allow the student to apply micro-computer theory and develop an understanding of micro-computer operation.

Prerequisites: Consent of Instructor

Corequisite: EET 216

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 450

Program **ELECTRICAL TECHNOLOGY**

EET 218 **COMPUTER APPLICATIONS I** **Credit** **3.0**

45 Hours

Course Description

Introduces peripheral devices and how they interface with the microprocessor.

Prerequisites: Consent of Instructor

Corequisite: EET 219

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Analyze memory and memory interfacing

2 Check disc drive interface signals

3 Align disc drives

4 Troubleshoot and repair peripheral devices

5 Load and run diagnostic programs

Program **ELECTRICAL TECHNOLOGY**

EET 219 **COMPUTER APPLICATIONS I LAB** **Credit** **2.0**

90 Hours

Course Description

This course allows the student to apply analyzing and memory interfacing, to align disc drives, and to load and run diagnostic programs.

Prerequisites: Consent of Instructor

Corequisite: EET 218

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 218

Program **ELECTRICAL TECHNOLOGY**

EET 220 **COMPUTER REPAIR AND SERVICING TECHNOLOGY I** **Credit** **3.0**

45 Hours

Course Description

Introduces the fundamentals of computers and computer systems. Students will use diagnostic software as well as Windows and DOS. Layout of basic computer system and peripherals is studied as well as basic troubleshooting techniques using software and test equipment. This course will prepare students to take standard industry certification tests.

Prerequisites: Consent of Instructo

Corequisite: EET 221

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Discuss safety, tools
2	Explain each major section of a computer system
3	Operate and configure DOS/Windows systems
4	Discuss motherboard layout and configuration
5	Analyze memory and memory interfacing and installation
6	Describe and troubleshoot power supplies
7	Discuss and installmicroprocessor, coprocessor and cache
8	Describe, install and troubleshoot floppy drives
9	Install and troubleshoot hard disk drives
10	Discuss serial and parallel port troubleshooting and configuration
11	Select, install and troubleshoot video monitors and adapters
12	Describe, install and troubleshoot keyboards and mice
13	Describe, install and troubleshoot multimedia peripherals
14	Discuss interrupts and direct memory addressing (DMA's)
15	Discuss and troubleshoot CMOS
16	Load and run diagnostic
17	Discuss basic software installation procedures
18	Describe, install and troubleshoot various computer printers
19	Run and use internet software

Program **ELECTRICAL TECHNOLOGY**

EET 221 **COMPUTER REPAIR AND SERVICING TECHNOLOGY I LAB** **Credit** **2.0**

90 Hours

Course Description

Through hands-on experience the student will install, calibrate, troubleshoot, program and maintain mini-, micro- and main frame computers and their peripheral equipment.

Prerequisites: Consent of Instructor

Corequisite: EET 220

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 220

Program **ELECTRICAL TECHNOLOGY**

EET 222 **COMPUTER REPAIR AND SERVICING TECHNOLOGY II** **Credit** **3.0**

45 Hours

Course Description

Provides the student with the theory and operation of mini-, micro-, and main-frame computers; input-output peripheral equipment; memory elements; arithmetic elements; data transmittal systems; interfacing; digitized test equipment; diagnostic programming; installation; troubleshooting and repair of computers used in business and industry. Emphasis is on installing, troubleshooting and repairing

Prerequisites: Consent of Instructor

Corequisite: EET 223

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Define basic networking terminology
2	Discuss and setup fundamental data communication techniques
3	Explore network topologies and cable selection
4	Discuss, install and troubleshoot a per-to-peer network
5	Discuss, install and troubleshoot a client/server network
6	Explain network administration and security
7	Discuss, install and troubleshoot network workstations
8	Setup and run network diagnostic software
9	Describe general network troubleshooting techniques

Program **ELECTRICAL TECHNOLOGY**

EET 223 **COMPUTER REPAIR AND SERVICING TECHNOLOGY II LAB** **Credit** **2.0**

90 Hours

Course Description

Through hands on experience the student will design, install, troubleshoot, and maintain computer network systems.

Prerequisites: Consent of Instructor

Corequisite: EET 222

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 220

Program **ELECTRICAL TECHNOLOGY**

EET 224 **COMPUTER REPAIR AND SERVICING TECHNOLOGY** **Credit** **6.0**

90 Hours

Course Description

Introduces the fundamentals of computers and computer systems. Students will use diagnostic software as well as Windows and DOS. Layout of basic computer system andperipherals is studied as well as basic troubleshooting techniques using software and test equipment. Computer Repair and Servicing also introduces the fundamentals of computer networks. Students will use software and hardware needed to build and maintain a computer network. Popular network software packages will be discussed and installed. Network topologies and architectures will be discussed and built upon. Basic network troubleshooting will be performed using test devices and software. This course will prepare the student

Prerequisites: Consent of Instructor
Corequisite: EET 225
Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Discuss safety, tools
2	Explain major section of a computer system
3	Operate and configre DOS/Windows systems
4	Discuss motherboard layout and configuration
5	Analyze memory and memory interfacing and installation
6	Describe and troubleshoot power supplies
7	Discuss and install microprocessor, coprocessor and cache
8	Describe, install and troubleshoot floppy drives
9	Install and troubleshoot hard disk drives
10	Discuss serial and parallel port troubleshooting and configuration
11	Select, install and troubleshoot video monitors and adapters
12	Describe, install and troubleshoot keyboards and mice
13	Describe, install and troubleshoot multimedia peripherals
14	Discuss interrupts and direct memory addressing (DMA's)
15	Discuss and troubleshoot CMOS
16	Load and run diagnostic aids and virus programs
17	Discuss basic software installation procedures
18	Describe, install and troubleshoot various computer printers

19 Run and use Internet software

20 Define basic networking terminology

21 Discuss and setup fundamental data communication techniques

22 Explore network topologies and cable selection

23 Discuss, install and troubleshoot a per-to-peer network

24 Discuss, install and troubleshoot a client/server network

25 Explain network administration and security

26 Discuss, install and troubleshoot network workstations

27 setup and run network diagnostic software

28 Describe general network troubleshooting techniques

Program **ELECTRICAL TECHNOLOGY**

EET 225 **COMPUTER REPAIR AND SERVICING TECHNOLOGY LAB** **Credit** **4.0**

180 Hours

Course Description

Through hands-on experience the student will install, troubleshoot, program and maintain computers, their peripheral equipment and computer network systems.

Prerequisites: Consent of Instructor

Corequisite: EET 224

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 224

Program **ELECTRICAL TECHNOLOGY**

EET 226 **FUNDAMENTALS OF CONSUMER ELECTRONICS** **Credit** **3.0**

45 Hours

Course Description

This course introduces basic television theory. Basic principles of audio and video recording are also included. The block diagram and basic circuits of consumer radios, stereos, TV receivers and VCRs are studied, as well as, basic troubleshooting techniques using meter, oscilloscope, signal generators and

Prerequisites: Consent of Instructor

Corequisite: EET 227

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

0	
1	Analyze the components of a composite video signal
2	Identify components of a television block diagram
3	Identify defective block by symptom diagnosis
4	Troubleshoot television low voltage power supply
5	Troubleshoot television video processing circuits
6	Troubleshoot television audio processing circuits
7	Check and adjust all customer controls
8	Identify components of a VCR block diagram
9	Identify defective blocks of a VCR by system diagnosis
10	Clean VCR heads and tape path
11	Identify mechanical components of a VCR
12	Check and replace video heads
13	Clean and align tape player head
14	Check and replace audio tape player head

Program **ELECTRICAL TECHNOLOGY**

EET 227 **FUNDAMENTALS OF CONSUMER ELECTRONICS LAB** **Credit** **2.0**

90 Hours

Course Description

This laboratory course allows the student to verify the theory by analyzation and measurements in radio and TV circuitry.

Prerequisites: Consent of Instructor

Corequisite: EET 226

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 226

Program **ELECTRICAL TECHNOLOGY**

EET 228 **CONSUMER ELECTRONICS I** **Credit** **3.0**

45 Hours

Course Description

This course introduces the technical skills relating to radio and television broadcast standards. The student is introduced to the composite signal, signal processing and terminology used in receiver block

Prerequisites: Consent of Instructor

Corequisite: EET 229

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Identify the components of a television block diagram

2 Identify a defective block by symptom diagnosis

3 Troublehoot a television low voltage power supply

4 Troubleshoot television audio processing circuits

5 Troubleshoot video processing circuits

6 Repair a compact disc mechanism

Program **ELECTRICAL TECHNOLOGY**

EET 229 **CONSUMER ELECTRONICS I LAB** **Credit** **2.0**

90 Hours

Course Description

This course allows the student to verify the theories introduced in EETS 462, by analyzation and measurements in consumer electronic products circuitry.

Prerequisites: Consent of Instructor

Corequisite: EET 228

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 228

Program **ELECTRICAL TECHNOLOGY**

EET 230 **CONSUMER ELECTRONICS II** **Credit** **3.0**

45 Hours

Course Description

The student will gain specific technical knowledge of the radio and TV block diagram from mid-point to finish. The study of video amplifiers, TV power supplies, synchronizing circuits and the servicing and troubleshooting of radio and TV receivers is included.

Prerequisites: Consent of Instructor or EET 228

Corequisite: EET 231

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Troubleshoot video IF circuits
2	Troubleshoot UHF and VHF mechanical and electronic tuners
3	Troubleshoot AGC circuits
4	Troubleshoot synchronization circuits
5	Troubleshoot deflection oscillators
6	Troubleshoot horizontal output circuits
7	Troubleshoot vertical ouput circuits
8	Troubleshoot high voltage rectifier circuits
9	Troubleshoot focus rectifier and focus divider circuits
10	Troubleshoot high voltage regulator circuits
11	Troubleshoot high voltage shutdown circuits
12	Troubleshoot color processing circuits
13	Troubleshoot remote control transmitter and receiver circuits
14	Check and replace deflection yoke
15	Check and replace CRT
16	Check and adjust all customer controls
17	Troubleshoot automatic degaussing circuits
18	Check and replace integrated high voltage transformers
19	Check sound IF and sound detector alignment
20	Degauss color television

21 Check and adjust all service controls

22 Perform color temperature adjustments

23 Perform color purity adjustments

24 Perform static convergence adjustments

25 Perform dynamic convergence adjustments

Program **ELECTRICAL TECHNOLOGY**

EET 231 **CONSUMER ELECTRONICS II LAB** **Credit** **2.0**

90 Hours

Course Description

The application of advanced television theory combined with troubleshooting procedures designed to develop a scientific approach to television servicing is practiced in this laboratory course.

Prerequisites: Consent of Instructor

Corequisite: EET 231

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 230

Program **ELECTRICAL TECHNOLOGY**

EET 232 **VCR MAINTENANCE AND REPAIR** **Credit** **3.0**

45 Hours

Course Description

The student will gain specific technical skills in the maintenance and repair of various brands of VCRs, tape players, recorders and record players. An introduction to the mechanical drive units and linkage is provided. The electronic repairs are effected by the study of block diagrams first and then by schematic diagrams utilized in troubleshooting.

Prerequisites: Consent of Instructor

Corequisite: EET 233

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Identify components of a VCR block diagram
2	Identify defective blocks of a VCR by system diagnosis
3	Clean a VCR head and the tape path
4	Clean and replace a VCR idler wheel assembly
5	Check and replace sensors in VCRs
6	Check and replace video heads
7	Identify the mechanical components of a VCR
8	Clean and replace VCR drive belts
9	Demonstrate a working knowledge of all VCR mechanical adjustments
10	Troubleshoot capstan servo circuits
11	Troubleshoot cylinder servo circuits
12	Troubleshoot system control circuits
13	Demonstrate a working knowledge of all VCR electrical adjustments
14	Clean and align audio tape player head
15	Demagnetize an audio tape player head
16	Check and replace an audio tape player head
17	Clean and replace an audio tape player drive belt

Program **ELECTRICAL TECHNOLOGY**

EET 233 **VCR MAINTENANCE AND REPAIR LAB** **Credit** **2.0**

90 Hours

Course Description

The laboratory course in VCR maintenance and repair introduces the student to the basic structure of the VCR and its operating conditions. The practical applications of troubleshooting and repair are

Prerequisites: Consent of Instructor

Corequisite: EET 232

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 232

Program **ELECTRICAL TECHNOLOGY**

EET 234 **CONSUMER ELECTRONICS TECHNOLOGY** **Credit** **4.0**

90 Hours

Course Description

This course will allow the student to gain specific technical knowledge of the radio and TV block diagram. The study of video amplifiers, TV power supplies, synchronizing circuits, and the servicing and troubleshooting of radio and TV receivers is included.

Prerequisite: Consent of Instructor

Corequisite: EET 235

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Identify components of a television block diagram
2	Identify a defective block by symptom diagnosis
3	Troubleshoot television low voltage power supplys
4	Troubleshoot television audio processing circuits
5	Troubleshoot video processing circuits
6	Repair CD platter mechanisms
7	Replace laser cartridge in a CD platter
8	Clean and align audio tape paths
9	Repair audio tape transport mechanisms
10	Troubleshoot video IF circuits
11	Troubleshoot UHF and VHF tuners
12	Troubleshoot AGC circuits
13	Troubleshoot synchronization circuits
14	Troubleshoot deflection circuits
15	Troubleshoot horizontal output circuits
16	Troubleshoot vertical output circuits
17	Troubleshoot high voltage circuits
18	Troubleshoot color processing circuits
19	Align and replace deflection yokes
20	Check and replace CRTs

21 Check and adjust all customer controls

22 Troubleshoot automatic degaussing circuits

23 Check sound IF and sound detector alignment

Program **ELECTRICAL TECHNOLOGY**

EET 235 **CONSUMER ELECTRONICS TECHNOLOGY LAB** **Credit** **4.0**

180 Hours

Course Description

This laboratory course allows the student to verify theory by analysis and measurements in radio and TV circuitry. The application of advanced theory combined with troubleshooting procedures is designed to develop a scientific approach to servicing consumer electronics equipment.

Prerequisite: Consent of Instructor

Corequisite: EET 234

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 234

Program **ELECTRICAL TECHNOLOGY**

EET 236 **NETWORK ESSENTIALS** **Credit** **3.0**

45 Hours

Course Description

Course includes intensive study of the theory and installation of computer networks.

Prerequisites: Consent of Instructor or EET 222, EET 224

Corequisite: EET 237

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Describe Local Area Networks
2	Describe Wide Area Networks
3	Define and explain network protocols
4	Install current workstation operating systems on the network
5	Configure and use curent workstation operating systems on the network
6	Install current server operating systems
7	Configure, and use current server operating systems
8	Plan physical layout of a network
9	Install and configure network hardware
10	Configure and use internetworking between different operating systems

Program **ELECTRICAL TECHNOLOGY**

EET 237 **NETWORK ESSENTIALS LAB** **Credit** **2.0**

90 Hours

Course Description

Course includes practical applications of the theory and installation of computer networks.

Prerequisites: Consent of Instructor or EET 223, EET 225

Corequisite: EET 236

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1	Describe Local Area Networks
2	Describe Wide Area Networks
3	Define and explain network protocols
4	Install current workstation operating systems on the network
5	Configure and use current workstation operating systems on the network
6	Install current server operating systems
7	Configure, and use current server operating systems
8	Plan physical layout of a network
9	Install and configure network hardware
10	Configure and use internetworking between different operating systems

Program **ELECTRICAL TECHNOLOGY**

EET 238 **NETWORK ADMINISTRATION AND MAINTENANCE** **Credit** **3.0**

45 Hours

Course Description

Course includes administration, maintenance, and troubleshooting of computer networks.

Prerequisites: Consent of Instructor or EET 236

Corequisite: EET 239

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Setup and manage user and group accounts
2	Administer remote servers from various types of client computers
3	Create and manage policies profiles for various situations
4	Monitor performance of various functions by using a performance monitor
5	Troubleshoot installation failures
6	Resolve boot failures
7	Identify and solve configuration errors
8	Troubleshoot network printer problems
9	Resolve remote access difficulties
10	Choose the appropriate course of action to take to resolve connectivity problems
11	Manage mass storage resources
12	Plan and perform preventive maintenance on systems
13	Expand and modify existing systems
14	Perform advanced system problem resolutions

Program **ELECTRICAL TECHNOLOGY**

EET 239 **NETWORK ADMINISTRATION & MAINTENANCE LAB** **Credit** **2.0**

90 Hours

Course Description

Course includes practical applications of administration, maintenance, and troubleshooting of computer

Prerequisites: Consent of Instructor or EET 237

Corequisite: EET 238

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1	Setup and manage user and group accounts
2	Administer remote servers from various types of client computers
3	Create and manage policies profiles for various situations
4	Monitor performance of various functions by using a performance monitor
5	Troubleshoot installation failures
6	Resolve boot failures
7	Identify and solve configuration errors
8	Troubleshoot network printer problems
9	Resolve remote access difficulties
10	Choose the appropriate course of action to take to resolve connectivity problems
11	Manage mass storage resources
12	Plan and perform preventive maintenance on systems
13	Expand and modify existing systems
14	Perform advance system problem resolutions

Program **ELECTRICAL TECHNOLOGY**

EET 240 **NETWORK ESSENTIALS ADMINISTRATION AND MAINTENANCE** **Credit** **6.0**

90 Hours

Course Description

Course includes intensive study of the theory, installation, administration, maintenance, and troubleshooting of computer networks.

Prerequisites: Consent of Instructor or EET 222, EET 224

Corequisite: EET 241

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Describe Local Area Networks
2	Describe Wide Area Networks
3	Define and explain network protocols
4	Install current workstation operating systems on the network
5	Configure and use current workstation operating systems on the network
6	Install current server operating systems
7	Configure, and use current server operating systems
8	Plan physical layout of a network
9	Install and configure network hardware
10	Configure and use internetworking between different operating systems
11	Setup and manage user and group accounts
12	Administer remote servers from various types of client computers
13	Create and manage policies and profiles for various situations
14	Monitor performance of various functions by using a performance monitor
15	Troubleshoot installation failures
16	Resolve boot failures
17	Identify and solve configuration errors
18	Troubleshoot network printer problems
19	Resolve remote access difficulties
20	Choose the appropriate course of action to take to resolve connectivity problems

21 Manage mass storage resources

22 Plan and perform preventive maintenance on systems

23 Expand and modify existing systems

24 Perform advanced system problem resolutions

Program **ELECTRICAL TECHNOLOGY**

EET 241 **NETWORK ESSENTIALS ADMINISTRATION & MAINTENANCE LAB** **Credit** **4.0**

180 Hours

Course Description

Course includes practical applications of the theory, installation, administration, maintenance, and troubleshooting of computer networks.

Prerequisites: Consent of Instructor or EET 223, EET 225

Corequisite: EET 240

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1	Describe Local Area Networks
2	Describe Wide Area Networks
3	Define and explain network protocols
4	Install current workstation operating systems on the network
5	Configure and use current workstation operating systems on the network
6	Install current server operating systems
7	Configure, and use current server operating systems
8	Plan physical layout of a network
9	Install and configure network hardware
10	Configure and use internetworking between different operating systems
11	Setup and manage user and group accounts
12	Administer remote servers from various types of client computers
13	Create and manage policies profiles for various situations
14	Monitor performance of various functions by using a performance monitor
15	Troubleshoot installation failures
16	Resolve boot failures
17	Identify and solve configuration errors
18	Troubleshoot network printer problems
19	Resolve remote access difficulties
20	Choose the appropriate course of action to take to resolve connectivity problems

21 Manage mass storage resources

22 Plan and perform preventive maintenance on systems

23 Expand and modify existing systems

24 Perform advanced system problem resolutions

Program **ELECTRICAL TECHNOLOGY**

EET 242 **ROBOTICS** **Credit** **3.0**

45 Hours

Course Description

This course provides an introduction to the theory of robotics including terminology, components, and basic programming.

Prerequisites: Consent of Instructor

Corequisites: EET 243

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Understand robotics terminology
2	Identify the basic components of a robot
3	Demonstrate knowledge of robotic motion, manipulator geometry, and the features of controllers
4	Identify the work enveolpes
5	Develop programs for simple robots
6	Operate a teach pendant
7	Demonstrate the knowledge of stepper motor operation
8	Demonstrate the knowledge of a closed loop servo system
9	Classify robots according to industry criteria
10	Identify robot power drive types
11	Describe positioning in terms of axis, actuators, and coordinate system
12	Identify types of control systems and sensors
13	Apply different methods of programming (teach, offline, etc.)
14	Write simple programs to exercise robot functions
15	Join programs to perform a full function
16	Identify the principles of robot safety
17	Describe the operation of various sensors used in robot control
18	Interface sensors to a robot
19	Describe the operation of ADC and DAC systems
20	Define open loop and closed loop systems

21 Design an automated system to perform a manufacturing operation

22 Write a speech synthesis program

Program **ELECTRICAL TECHNOLOGY**

EET 243 **ROBOTICS LAB** **Credit** **2.0**

90 Hours

Course Description

This laboratory course provides the student with an opportunity to apply theoretical knowledge of robots including controllers, components, robotic motion and programming.

Prerequisites: Consent of Instructor

Corequisite: EET 242

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 242

Program **ELECTRICAL TECHNOLOGY**

EET 244 **ADVANCED ELECTRONIC APPLICATION** **Credit** **6.0**

90 Hours

Course Description

Advanced theory and principles from previous courses are developed on an individual course basis.

Prerequisites: Consent of Instructor or EET 202, 204

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Review basic electronics fundamentals
2	Develop advanced projects for licensure or certification
3	Develop student skills required for certification
4	Provide opportunity for student to practice advanced job skills

Program **ELECTRICAL TECHNOLOGY**

EET 246 **COMMUNICATIONS TECHNIQUES** **Credit** **3.0**

45 Hours

Course Description

A study of the electromagnetic spectrum and communication techniques via the propagation of radio waves and light waves. Radio frequency and optical devices, terms, and concepts will be investigated.

Prerequisites: Consent of Instructor or EET 112

Corequisite: EET 247

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Understand principles and operations of IF circuits

2 Fabricate and demonstrate IF circuits

3 Troubleshoot and repair IF circuits

4 Understand principles and operations of RF circuits

5 Fabricate and demonstrate RF circuits

6 Troubleshoot and repair RF circuits

7 Understand principles and operations of signal modulation systems (AM, FM, stereo)

8 Troubleshoot and repair signal modulation systems (AM, FM, stereo)

9 Understand principles and operations of fiber optic circuits using photodiodes or LASERS

10 Troubleshoot and repair fiber optic circuits using photodiodes or LASERS

Program **ELECTRICAL TECHNOLOGY**

EET 247 **COMMUNICATIONS TECHNIQUES LAB** **Credit** **1.0**

45 Hours

Course Description

This course provides practical applications in the study of the electromagnetic spectrum and communications via the proprogation of light. Optical devices such as LEDs, laser diodes, photosensors

Prerequisites: Consent of Instructor or EET 113

Corequisite: EET 246

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 246

Program **ELECTRICAL TECHNOLOGY**

EET 250 **NATIONAL ELECTRICAL CODE** **Credit** **4.0**

60 Hours

Course Description

Provides a further understanding of the National Electrical Code and prepares students to take exams associated with the National Electrical Code.

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 There are no specific performance tasks for the National Electrical Code. The code pertains to all the tasks in the program

Program **ELECTRICAL TECHNOLOGY**

EET 252 **ELECTRICAL CONSTRUCTION II** **Credit** **2.0**

30 Hours

Course Description

Expands the knowledge and skills needed to work in commercial and industrial construction wiring.

Prerequisites: Consent of Instructor or EET 154

Corequisite: EET 253

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Lace cable and wires in open raceways and control panels
2	Install multi-conductor cables
3	Install non-metallic conduits for above and below ground installation
4	Install rigid conduit
5	Ground service to metallic bonding systems
6	Install busways
7	Install explosion proof fixtures and devices
8	Install lay-in duct work (wireways)
9	Install plug-in busways
10	Install under-floor raceways
11	Install low-voltage lighting controls
12	Install photo-electric control
13	Connect PC based climate control equipment
14	Install snow and ice melting equipment
15	Install dynamic, switching, and resistive sensing devices
16	Install intercom and public address systems
17	Draw control panel diagrams
18	Draw external power diagrams
19	Connect emergency backup systems (rotary and solid-state types)
20	Run fiber optic cable in raceways

Program **ELECTRICAL TECHNOLOGY**

EET 253 **ELECTRICAL CONSTRUCTION II LAB** **Credit** **2.0**

90 Hours

Course Description

Provides hands-on experiences needed to work in commercial and industrial construction wiring.

Corequisite: EET 252

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 252

Program **ELECTRICAL TECHNOLOGY**

EET 254 **ELECTRICAL CONSTRUCTION** **Credit** **3.0**

45 Hours

Course Description

This course involves the study of materials and procedures and expands the knowledge and skills needed to work in commercial and industrial construction wiring.

Corequisite: EET 255

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Install circuits using non-metallic sheathed cable
2	Install and connect branch circuit grounding
3	Install power feeder wiring system to equipment
4	Install conductors in conduit or raceway and terminate
5	Install underground cable
6	Install wire terminals and lugs
7	Make splices using approved methods
8	Install flexible and liquid tight conduit
9	Install electrical metallic tubing
10	Install temporary service
11	Install main distribution panel
12	Install, identify, and label circuit breakers, fuses, and fuse adapters in distribution panels
13	Install underground and overhead service entrances
14	Test circuits for proper operation
15	Inventory equipment, materials and supplies
16	Complete an accident or incident report
17	Install lighting dimmer systems
18	Mark location of switches and outlets on studding
19	Locate room center for ceiling outlets
20	Mark location of single system components

21 Layout and install single and ganged boxes both flush and surface mounted (new construction)

22 Layout and install ganged boxes both flush and surface mounted (old construction)

23 Install switches - single pole, three-way, four-way

24 Install duplex and special purpose receptacles

25 Install lighting fixtures (incandescent, electrical discharged, recessed and surfaced)

26 Install door chime, switches, and transformer

27 Test emergency lighting system

28 Connect automatic garage door opener

29 Install overhead fan or fanlight with controls

30 Connect or troubleshoot water heaters

31 Install single-phase dual voltage motors

32 Connect combination heating-cooling unit

33 Connect ceiling or wall heating panel

34 Install baseboard heating unit

35 Install line and low voltage thermostats

36 Install radio, TV, and telephone outlets

37 Compile a bill of materials from wiring diagrams drawn to specifications

38 Draw wiring diagrams to specifications

39 Estimate total cost of a specific installation

40 Install and test ground fault interrupts

41 Lace cable and wires in open raceways and control panels

42 Install multi-conductor cables

43 Install non-metallic conduits for above and below ground installation

44 Install rigid conduit

45 Ground service to metallic bonding systems

46 Install busways

47 Install explosion proof fixtures and devices

48 Install lay-in duct work (wireways)

49 Install plug-in busways

50 Install under-floor raceways

51 Install low-voltage lighting controls

52 Install photo-electric control

53 Connect PC based climate control equipment

54 Install snow and ice melting equipment

55 Install dynamic, switching, and resistive sensing devices

56 Install intercom and public address systems

57 Draw control panel diagrams

58 Draw external power diagrams

59 Connect emergency backup systems (rotary and solid-state types)

60 Run fiber optic cable in raceways

Program **ELECTRICAL TECHNOLOGY**

EET 255 **ELECTRICAL CONSTRUCTION LAB** **Credit** **4.0**

180 Hours

Course Description

Designed to give hands-on experiences with electrical materials and equipment in commercial and industrial construction wiring.

Corequisite: EET 254

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 254

Program **ELECTRICAL TECHNOLOGY**

EET 256 **POLYPHASE POWER CALCULATIONS** **Credit** **2.0**

30 Hours

Course Description

This course is used primarily to prepare the student for computations and problem solving based on heavy industrial requirements. The math will successfully prepare the student for single and polyphase computations on transformers, motors, and distribution systems.

Prerequisites: Consent of Instructor or EET 108

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Solve complex electrical circuits using Kirchhoff's Law

2 Select conductor size and calculate voltage drops for polyphase systems

3 Size transformer polyphase loads

4 Correct power factor on polyphase distribution and drive systems

5 Program PLC functions using logic numbering systems

6 Solve grid networking systems

Program **ELECTRICAL TECHNOLOGY**

EET 258 **MANUFACTURED HOUSING** **Credit** **2.0**

30 Hours

Course Description

This course addresses the special requirements of manufactured home wiring. Manufactured homes incorporate the usual wiring practices learned, but there are some notable exceptions. Special considerations are required for the services, grounding, and self-contained devices having odd panels and outlet locations. The electrical standards for manufactured homes are found in the current NEC, Article 550 and 24 CFR CH xx (4-1-87 Edition). When there is conflict, the CFR takes precedence.

Prerequisite: EET 108

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Calculate demand for multiple manufactured home services
2	Install service equipment for manufactured homes
3	Install grounding system for multiple manufactured homes
4	Calculate feeder for a manufactured home
5	Select feeder for a manufactured home
6	Install feeder in a manufactured home
7	Ground manufactured home
8	Select conductors for a manufactured home
9	Select outlet locations for a manufactured home
10	Install fixed appliance in a manufactured home
11	Test wiring with a Meg-Ohm meter

Program **ELECTRICAL TECHNOLOGY**

EET 260 **HOME AUTOMATION TECHNOLOGY** **Credit** **2.0**

30 Hours

Course Description

This course will provide the student with the knowledge to understand the technology involved in the Home Automation Industry. The student will learn to install, interface, and troubleshoot the sensors, control modules and command centers used in the automated home. An overview of programming the home control system will be provided.

Prerequisites: Consent of Instructor or EET 108

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Identify electrical symbols used in house automation plans
2	Install service centers
3	Install home automation wiring according to the National Electrical Code
4	Use cable terminating tools for stripping and crimping communications cable
5	Terminate home automation cables
6	Install control modules
7	Install microprocessor command centers
8	Interface sensor and control modules to microprocessors
9	Program home automation systems
10	Troubleshoot home automation systems

Program **ELECTRICAL TECHNOLOGY**

EET 262 **AGRICULTURAL ELECTRICITY** **Credit** **2.0**

30 Hours

Course Description

This course addresses the special requirements of agricultural wiring. Agricultural buildings require special consideration and planning because of corrosive environments, dust and animals. Agricultural buildings usually have damp environments and multiple service laterals. The remote locations make these buildings high risks for lightning strikes.

Prerequisites: Consent of Instructor or EET 108

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Design wiring systems for silos and feeder systems
2	Design wiring systems for milk parlors
3	Design wiring systems for hog houses
4	Design wiring systems for farm machine storages and shops
5	Design wiring systems for hay storages
6	Design wiring systems for grain storages
7	Design wiring systems for horse barns
8	Design stockwater electrical systems
9	Design electrical fence systems
10	Design wiring systems for specialized farm buildings
11	Calculate service for milk parlors
12	Calculate services for silo and silage feeders
13	Calculate services for hog houses
14	Calculate wiring systems for farm machine storages and shops
15	Calculate wiring system for hay storage
16	Calculate wiring system for grain storage
17	Calculate wiring system for horse barns
18	Calculate stockwater electrical systems
19	Calculate electrical fence system
20	Calculate wiring system for specialized farm buildings

21 Calculate size of farm service

22 Plan location of farm service

23 Plan auxiliary power

24 Plan service laterals, above and below ground

25 Mark position of service lateral poles

26 String lateral conductors

27 Install auxiliary power

28 Install motor controls

29 Install water thermostats

30 Install ventilation systems

31 Plan lightning protection of agricultural buildings

32 Plan grounding system for agricultural buildings

33 Plan grounding system for agricultural service

34 Install lightning arrestors

35 Install lightning protection systems

Program **ELECTRICAL TECHNOLOGY**

EET 264 **ROTATING MACHINERY** **Credit** **2.0**

30 Hours

Course Description

This course focuses on the construction, operation, and maintenance of DC motors and generators and AC motors and alternators.

Prerequisites: EET 108 or Consent of Instructor

Corequisite: EET 265

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Change the output voltage of alternators
2	Measure the frequency of alternators
3	Install two three-phase alternators in parallels
4	Install alternators
5	Change speed of single phase motors
6	Measure the torque of motors
7	Connect single-phase motor to run on different voltages
8	Connect and test capacitor start motors
9	Connect and test capacitor run motors
10	Connect and test repulsion-induction motors
11	Connect and test shaded pole motors
12	Replace split-phase motors
13	Change the direction of rotation of electrical motors
14	Connect three-phase motors to run on different voltages
15	Connect three-phase motor stator for delta operations
16	Connect three-phase motor stator for star operations
17	Connect and test synchronous motors
18	Connect and test three-phase induction motors
19	Connect and test wound rotor motors
20	Install and test DC series motors for serviceability

21 Install and test DC shunt motors for serviceability

22 Install and test DC compound motors for serviceability

Program **ELECTRICAL TECHNOLOGY**

EET 265 **ROTATING MACHINERY LAB** **Credit** **2.0**

90 Hours

Course Description

This laboratory course provides practical experience in the construction, operation and maintenance of AC motors and alternators and DC motors and generators.

Prerequisites: Consent of Instructor or EET 108

Corequisite: EET 264

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 264

Program **ELECTRICAL TECHNOLOGY**

EET 266 **ROTATING MACHINERY AND TRANSFORMERS** **Credit** **3.0**

45 Hours

Course Description

Study of the operation and installation of AC single phase and three phase transformers. This course focuses on the construction, operation and maintenance of DC motors and generators and AC motors and

Prerequisites: Consent of Instructor or EET 108

Corequisite: EET 267

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Connect a dual voltage transformer for its highest input and output voltages
2	Connect dual voltage transformer for the low voltage input and output
3	Connect an ammeter to high voltage line using a current transformer
4	Connect an auto transformer to give a variety of voltages
5	Connect transformers to supply 3-phase power, 4-2 configuration
6	Connect transformers to supply 3-phase power, delta configuration
7	Connect transformers to supply 3-phase power, Y configuration
8	Connect the secondary of a 3-phase bank to give a 4-wire delta system
9	Connect 3-single phase transformers to form a delta-delta configuration
10	Connect 3-single phase transformers to form a delta-star configuration
11	Connect 3-single phase transformers to form a star-delta 3-phase
12	Connect 3-single phase transformers in an open-delta configuration
14	Connect 2 single-phase transformers in parallel
15	Connect a voltmeter using a potential transformer to determine voltage
16	Test transformer for output and performance under resistive, capacitive, and inductive loads
17	Connect buck-boost transformer to increase voltage
18	Connect buck-boost transformer to decrease voltage
19	Change the output voltage of alternators
20	Measure the frequency of alternators
21	Install two three-phase alternators in paralllels

22 Install alternators

23 Change speed of single phase motors

24 Measure the torque of motors

25 Connect single-phase motor to run on different voltages

26 Connect and test capacitor start motors

27 Connect and test capacitor run motors

28 Connect and test repulsion-induction motors

29 Connect and test shaded pole motors

30 Replace split-phase motors

31 Change the direction of rotation of electrical motors

32 Connect three-phase motors to run on different voltages

33 Connect three-phase motor stator for delta operations

34 Connect three-phase motor stator for star operations

35 Connect and test synchronous motors

36 Connect and test three-phase induction motors

37 Connect and test wound rotor motors

38 Install and test DC series motors for serviceability

39 Install and test DC shunt motors for serviceability

40 Install and test DC compound motors for serviceability

41 Install and test DC series generators for serviceability

42 Install and test DC shunt generators for serviceability

43 Install and test DC compound generators for serviceability

44 Change output voltages of DC generators

Program **ELECTRICAL TECHNOLOGY**

EET 267 **ROTATING MACHINERY AND TRANSFORMERS LAB** **Credit** **3.0**

135 Hours

Course Description

Experiences in the actual connecting and operating of single phase and three-phase transformers. This laboratory course provides practical experience in the construction, operation and maintenance of AC motors and alternators and DC motors and generators.

Corequisite: EET 266

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

0 See Task List for EET 266

Program **ELECTRICAL TECHNOLOGY**

EET 268 **ROTATING MACHINERY ELECTRICAL MOTOR CONTROLS I** **Credit** **3.0**

45 Hours

Course Description

This course focuses on the construction, operation and maintenance of DC motors and generators and AC motors and alternators. This course addresses the diversity of control devices and applications used in industry today. Safety and electrical lockouts are also included.

Prerequisites: Consent of Instructor or EET 108

Corequisite: EET 269

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Change the output voltage of alternators
2	Measure the frequency of alternators
3	Install two three-phase alternators in parallels
4	Install alternators
5	Change speed of single phase motors
6	Measure the torque of motors
7	Connect single-phase motor to run on different voltages
8	Connect and test capacitor start motors
9	Connect and test capacitor run motors
10	Connect and test repulsion-induction motors
11	Connect and test shaded pole motors
12	Replace split-phase motors
13	Change the direction of rotation of electrical motors
14	Connect three-phase motors to run on different voltages
15	Connect three-phase motor stator for delta operations
16	Connect three-phase motor stator for star operations
17	Connect and test synchronous motors
18	Connect and test three-phase induction motors
19	Connect and test wound rotor motors
20	Install and test DC series motors for serviceability

21 Install and test DC shunt motors for serviceability

22 Install and test DC compound motors for serviceability

23 Install and test DC series generators for serviceability

24 Install and test DC shunt generators for serviceability

25 Install and test DC compound generators for serviceability

26 Change output voltages of DC generators

27 Connect control relay systems

28 Connect dynamic braking circuit for AC motors

29 Connect dynamic braking circuit for DC motors

30 Test magnetic starters

31 Connect overload relays into starting control circuits

32 Connect potential type motor starting relays

33 Connect reduced voltage starters

34 Connect time delay relays

35 Connect motor for automatic controls

36 Connect automatic reduced voltage starter for DC motor control

37 Connect control relay systems

38 Connect limit switches

39 Connect motor control circuits for pluggings

40 Connect point starters for DC motors

41 Connect push button stations

42 Connect selector switches

43 Connect sensing devices (non-electric)

44 Connect magnetic starters

Program **ELECTRICAL TECHNOLOGY**

EET 269 **ROTATING MACHINERY AND MOTOR CONTROLS I LAB** **Credit** **4.0**

180 Hours

Course Description

This laboratory provides practical experience in the use of control devices and their applications in industry today. This course also provides experience in the construction, operation and maintenance of AC motors and altenators, and DC motors and generators. Safety and electrical lockouts are also included.

Corequisite: EET 268

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 268

Program **ELECTRICAL TECHNOLOGY**

EET 270 **ELECTRICAL MOTOR CONTROLS I** **Credit** **2.0**

30 Hours

Course Description

This course addresses the diversity of control devices and applications used in industry today. Safety and electrical lockouts are also included.

Prerequisites: Consent of Instructor or EET 108

Corequisite: EET 271

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Connect control relay systems
2	Connect dynamic braking circuit for AC motors
3	Connect dynamic braking circuit for DC motors
4	Test magnetic starters
5	Connect overload relays into starting control circuits
6	Connect potential type motor starting relays
7	Connect reduced voltage starters
8	Connect time delay relays
9	Connect motor for automatic controls
10	Connect automatic reduced voltage starter for DC motor control
11	Connect control relay systems
12	Connect limit switches
13	Connect motor control circuits for pluggings
14	Connect point starters for DC motors
15	Connect push button stations
16	Connect selector switches
17	Connect sensing devices (non-electric)
18	Connect magnetic starters

Program **ELECTRICAL TECHNOLOGY**

EET 271 **ELECTRICAL MOTOR CONTROLS I LAB** **Credit** **2.0**

90 Hours

Course Description

This laboratory provides practical experience in the use of control devices and their applications in industry today. Safety and electrical lockouts are also included.

Corequisite: EET 270

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 270

Program **ELECTRICAL TECHNOLOGY**

EET 272 **ELECTRICAL MOTOR CONTROLS II** **Credit** **2.0**

30 Hours

Course Description

This course provides advanced study of motor controls in industry. The course addresses solid state relays, hall effect sensors, proximity detectors and photo detectors. Tasks include sketching, installing and troubleshooting the following: three phase controls, variable speed drives using relays as well as solid state devices, and introduction to programmable controls.

Prerequisite: EET 270

Corequisite: EET 273

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Plan an orderly shutdown procedure to conduct planned maintenance

2 Design and build control circuits utilizing electronic sensing devices

3 Design and build control circuit utilizing electronic output devices

4 Install drum switch for motor controls

5 Program a programmable logic controllers (PLC)

6 Install PLC to replace relay systems

7 Install PLC to operate fluid power systems

8 Install forward/reverse control for three-phase motors

9 Install inching, jogging control of three-phase motors

Program **ELECTRICAL TECHNOLOGY**

EET 273 **ELECTRICAL MOTOR CONTROLS II LAB** **Credit** **2.0**

90 Hours

Course Description

This course provides hands-on experience in advanced studies in electrical controls used in industry including three-phase motor control and variable speed control using solid state devices and

Prerequisite: EET 270

Corequisite: EET 272

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 272

Program **ELECTRICAL TECHNOLOGY**

EET 274 **ELECTRICAL MOTOR CONTROLS** **Credit** **3.0**

45 Hours

Course Description

This course addresses the diversity of control devices and applications used in industry today. Safety and electrical lockouts are also included. This course provides advanced study of motor controls in industry. The course addresses solid state relays, hall effect sensors, proximity detectors and photo detectors. Tasks include sketching, installing and troubleshooting the following: three phase controls, variable speed drives using relays as well as solid state devices, and introduction to programmable controls.

Prerequisite: Consent of Instructor or EET 108

Corequisite: EET 275

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Connect control relay systems
2	Connect dynamic braking circuit for AC motors
3	Connect dynamic braking circuit for DC motors
4	Test magnetic starters
5	Connect overload relays into starting control circuits
6	Connect potential type motor starting relays
7	Connect reduced voltage starters
8	Connect time delay relays
9	Connect motor for automtic controls
10	Connect automatic reduced voltage starter for DC motor control
11	Conenct control relay systems
12	Connect limit switches
13	Connect motor control circuits for pluggings
14	Connect point starters for DC motors
15	Connect push button stations
16	Connect selector switches
17	Connect sensing devices (non-electric)
18	Connect magnetic starters
19	Plan an orderly shutdown procedure to conduct planned maintenance

20	Design and build control circuits utilizing electronic sensing devices
21	Design and build control circuit utilizing electronic output devices
22	Install drum switch for motor controls
23	Program a programmable logic controllers (PLC)
24	Install PLC to replace relay systems
25	Install PLC to operate fluid power systems
26	Install forward/reverse control for three-phase motors
27	Install inching, jogging control of three-phase motors

Program **ELECTRICAL TECHNOLOGY**

EET 275 **ELECTRICAL MOTOR CONTROLS LAB** **Credit** **4.0**

180 Hours

Course Description

This laboratory provides practical experience in the use of control devices and their applications in industry today. Safety and electrical lockouts are also included. This course provides hands-on experience in advanced studies in electrical controls used in industry including three-phase motor control and variable speed control using solid state devices and programmable controls.

Corequisite: EET 274

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 274

Program **ELECTRICAL TECHNOLOGY**

EET 276 **PROGRAMMABLE LOGIC CONTROLLERS** **Credit** **2.0**

30 Hours

Course Description

This course includes the theory and application of programmable logic controllers to include installation, programming, interfacing, and troubleshooting of industrial PLCs.

Prerequisites: Consent of Instructor or EET 270

Corequisite: EET 277

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Describe basic operatin of programmable controllers
2	Apply language functions and symbols used in PLC
3	Translate relay logic to PLC logic
4	Fabricate I/O configurations using serial and parallel
5	Design simple programmable controller applications
6	Program PLCs
7	Install PLCs to replace relay systems
8	Install PLCs to operate fluid power systems
9	Plan a shutdown procedure for PLC managed equipment
10	Troubleshoot hardware faults using PLCs

Program **ELECTRICAL TECHNOLOGY**

EET 277 **PROGRAMMABLE LOGIC CONTROLLERS LAB** **Credit** **2.0**

90 Hours

Course Description

The laboratory course provides practical applications in programmable logic controllers to include installation, programming, interfacing, and troubleshooting of industrial PLCs.

Corequisite: EET 276

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 276

Program **ELECTRICAL TECHNOLOGY**

EET 278 **ELECTRICAL MOTOR CONTROL II AND PLC'S** **Credit** **3.0**

45 Hours

Course Description

This course provides advanced study of motor controls in industry. The course addresses solid state relays, hall effect sensors, proximity detectors and photo detectors. Tasks include sketching, installing and troubleshooting the following: three phase controls, variable speed drives using relays as well as solid state devices, and introduction to programmable controls. This course includes the theory and application of programmable logic controllers to include installation, programming, interfacing, and

Prerequisites: EET 270

Corequisite: EET 279

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Describe basic operation of programmable controllers
2	Apply language functions and symbols used in PLC
3	Translate relay logic to PLC logic
4	Fabricate I/O configurations using serial and parallel
5	Design simple programmable controller applications
6	Program PLCs
7	Install PLCs to replace relay systems
8	Install PLCs to operate fluid power systems
9	Plan a shutdown procedure for PLC managed equipment
10	Troubleshoot hardware faults using PLCs
11	Plan an orderly shutdown procedure to conduct planned maintenance
12	Design and build control circuits utilizing electronic sensing devices
13	Design and build control circuit utilizing electronic output devices
14	Install drum switch for motor controls
15	Program a programmable logic controllers (PLC)
16	Install forward/reverse control for three-phase motors
17	Install inching, jogging control of three-phase motors

Program **ELECTRICAL TECHNOLOGY**

EET 279 **ELECTRICAL MOTOR CONTROL II AND PLC'S LAB** **Credit** **4.0**

180 Hours

Course Description

The laboratory course provides practical applications in programmable logic controllers to include installation, programming, interfacing, and troubleshooting of industrial PLCs. This course provides hands-on experience in advanced studies in electrical controls used in industry including three-phase motor control and variable speed control using solid state devices and programmable controls.

Prerequisites: EET 270

Corequisite: EET 278

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 See Task List for EET 278

Program **ELECTRICAL TECHNOLOGY**

EET 281 **SPECIAL PROBLEMS I** **Credit** **1.0**

45 Hours

Course Description

A course designed for the student who has demonstrated specific special needs.

Prerequisites: Permission of Instructor

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 Selected tasks/problems as determined by the instructor

Program **ELECTRICAL TECHNOLOGY**

EET 283 **SPECIAL PROBLEMS II** **Credit** **2.0**

90 Hours

Course Description

A course designed for the student who has demonstrated specific special needs.

Prerequisites: Permission of Instructor

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 Selected tasks/problems as determined by the instructor

Program **ELECTRICAL TECHNOLOGY**

EET 285 **SPECIAL PROBLEMS III** **Credit** **3.0**

135 Hours

Course Description

A course designed for the student who has demonstrated specific special needs.

Prerequisites: Permission of Instructor

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 Selected tasks/problems as determined by the instructor

Program **ELECTRICAL TECHNOLOGY**

EET 298 **PRACTICUM** **Credit** **2.0**

150 Hours

Course Description

The Practicum provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Practicum do not receive compensation. This course may be taken for 1 - 8 credit hours.

Prerequisites: None

Lecture: **No** Lab: **No** Experience: **Yes**

TASK LIST

1 Gain career awareness and the opportunity to test career choice(s)

2 Receive work experience related to career interests prior to graduation

3 Integrate classroom studies with work experience

4 Receive exposure to facilities and equipment unavailable in a classroom setting

5 Increase employability potential after graduation

Program **ELECTRICAL TECHNOLOGY**

EET 299 **COOPERATIVE EDUCATION PROGRAM** **Credit** **2.0**

150 Hours

Course Description

Co-op provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Cooperative Education program receive compensation for their work. * This course may be taken for 1 - 8 credit hours.

Prerequisites: Consent of Instructor

Lecture: **No** Lab: **No** Experience: **Yes**

TASK LIST

1 Gain career awareness and the opportunity to test career choice(s)

2 Receive work experience related to career interests prior to graduation

3 Integrate classroom studies with work experience

4 Receive exposure to facilities and equipment unavailable in a classroom setting

5 Increase employability potential after graduation

6 Earn funds to help finance education expenses

Program **ELECTRICAL TECHNOLOGY**

EFM 100 **PERSONAL FINANCIAL MANAGEMENT** **Credit** **3.0**

45 Hours

Course Description

Successful completion of this course will result in an understanding of the role of the U.S. in a global economy and how an individual can function successfully in the U.S. economic system. Students will explore the various aspects involved in being responsible consumers, the importance of personal financial planning, the relationship between employment opportunities and financial security, and other aspects of becoming successful and productive workers, consumers, and citizens.

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Compare major economic systems in the global economy
2	Identify sources of consumer information, protection, rights and responsibilites
3	Describe the characteristics and services of financial institutions
4	Develop a personal financial plan
5	Identify investment opportunities
6	Compare and evaluate consumer credit
7	Identify major types of employee benefits
8	Complete various types of tax forms
9	Identify and compare basic types of health, life, auto and homeowner/renter insurance
10	Explain and discuss contingency planning including retirement and estate planning
11	Compute various financial transactions such as account reconciliation, interest, capital gains, etc.

Program **ELECTRICAL TECHNOLOGY**

FPX 100 **FLUID POWER** **Credit** **3.0**

45 Hours

Course Description

This course is a study of fluid power theory, component identification and application, schematic reading, and basic calculations related to pneumatic and hydraulic systems and their operations.

Corequisite: FPX 101

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Design simple hydraulic and pneumatic systems
2	Draw hydraulic and pneumatic circuits
3	Install pneumatic pressure regulator
4	Check and replace pneumatic pressure regulator
5	Install pressure relief valve
6	Check and replace pressure relief valve
7	Install non-rotating cylinder
8	Install hydraulic and pneumatic motors
9	Install pressure booster (intensifier)
10	Install pressure reducing valve
11	Install rotating cylinder
12	Replace 2-way, 3-way, and 4-way valves (solenoid operated valves)
13	Replace an accumulator
14	Adjust the pressure on hydraulic systems
15	Change filters in hydraulic systems
16	Change hydraulic fluid
17	Install hydraulic pressure regulator
18	Check and replace hydraulic pressure regulator
19	Install hydraulic sequence valve
20	Check and replace hydraulic sequence valve

21 Install counter balance valve

22 Install flow control or speed control valve

23 Install hydraulic pump

24 Replace hydraulic cylinder

Program **ELECTRICAL TECHNOLOGY**

FPX 101 **FLUID POWER LAB** **Credit** **2.0**

90 Hours

Course Description

This course provides practical experiences in the study of fluid power theory, hydraulics and pneumatics component identification, schematic reading, and basic calculations related to hydraulic and pneumatic systems and their operations.

Corequisite: FPX 100

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 SeeTask List for FPX 100

Program **ELECTRICAL TECHNOLOGY**

ISX 100 **INDUSTRIAL SAFETY** **Credit** **3.0**

45 Hours

Course Description

This course provides practical training in industrial safety. The students are taught to observe general safety rules and regulations, to apply work site and shop safety rules, and to apply OSHA regulations. Students are expected to obtain certification in first aid and cardiopulmonary resuscitation.

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Apply work site and lab safety procedures

2 Apply personal safety rules and procedures

3 Apply fire prevention rules and procedures

4 Obtain first aid certification

5 Obtain CPR certification

6 Demonstrate hazardous communications procedures

7 Describe and demonstrate universal precautions procedures

Program **ELECTRICAL TECHNOLOGY**

MTH 100 **FUNDAMENTALS OF MATHEMATICS** **Credit** **3.0**

45 Hours

Course Description

This course concentrates on basic math and is designed to assist the student in mastering and applying math skills in the areas of whole numbers, fractions, decimals, percentages, basic measurements, simple equations, ratio and proportions, computed measurements, tables and graphs, and use of the hand-held

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Without the use of a calculator, perform the fundamental arithmetic operations on whole numbers with accuracy and speed
2	Without the use of a calculator, perform the fundamental arithmetic operations on fractions with accuracy and speed
3	Without the use of a calculator, perform the fundamental arithmetic operations on decimals with accuracy and speed
4	Without the use of a calculator, perform the fundamental arithmetic operations on percents with accuracy and speed
5	Perform basic processes in problems dealing with English and metric units of measure
6	Perform conversions interchanging the English and metric systems of measure with accuracy
7	Utilize ratio/proportions
8	Apply basic formulas
9	Calculate area, volume and perimeter of basic shapes to include squares, rectangles and circles
10	Read and interpret tables and graphs
11	Use scientific calculators

Program **ELECTRICAL TECHNOLOGY**

MTH 110 **APPLIED MATHEMATICS I** **Credit** **3.0**

45 Hours

Course Description

This course teaches utilizing direct measure, fundamentals of algebra, geometric shapes, and introduction to right triangles, estimation and relevant formulas. These skills are used to solve occupationally-specific

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Use signed numbers
2	Apply algebraic symbols and terms
3	Solve simple equations
4	Apply algebraic principles to solve equations and program formulas
5	Solve proportions in work related problems and distinguish between direct and indirect relationships
6	Perform conversions interchanging English and metric units of linear and angular measure
7	Perform and apply surface measurement calculations
8	Perform and apply volume measurement calculations
9	Use exponents and radicals
10	Compute sides of right triangles using the Pythagorean Theorem
11	Use scientific calculators

Program **ELECTRICAL TECHNOLOGY**

MTH 120 **APPLIED MATHEMATICS II** **Credit** **3.0**

45 Hours

Course Description

This course presents advanced plane geometric principles, right-angle and oblique trigonometry, Cartesian, rectangular and polar coordinates with practical applications.

Prerequisite: MTH 110

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Apply basic plane geometric principles of lines
2	Apply basic plane geometric principles of angles
3	Apply basic plane geometric principles of triangles
4	Apply basic plane geometric principles of polygons
5	Apply basic plane geometric principles of circles and arcs
6	Apply basic plane geometric principles of congruency and similarity
7	Apply basic plane geometric principles of loci
8	Perform conversions between coordinate systems
9	Apply fundamentals of trigonometric functions and co-functions to right triangles
10	Apply the Law of Sine and the Law of Cosine to oblique triangles
11	Solve problems involving compound angles
12	Use scientific calculators

Program **ELECTRICAL TECHNOLOGY**

MTH 130 **APPLIED MATHEMATICS** **Credit** **6.0**

90 Hours

Course Description

See Course Description for MTH 110 and MTH 120. This is a combined class of MTH 110 and MTH 120.

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Use signed numbers
2	Apply algebraic symbols and terms
3	Solve simple equations
4	Apply algebraic principles to solve equations and program formulas
5	Solve proportions in work related problems and distinguish between direct and indirect relationships
6	Performs conversions interchanging English and metric units of linear and angular measure
7	Perform and apply surface measurement calculations
8	Perform and apply volume measurement calculations
9	Use exponents and radicals
10	Compute sides of right triangles using the Pythagorean Theorem
11	Apply basic plane geometric principles of lines
12	Apply basic plane geometric principles of angles
13	Apply basic plane geometric principles of triangles
14	Apply basic plane geometric principles of polygons
15	Apply basic plane geometric principles of circles and arcs
16	Apply basic plane geometric principles of congruency and similarity
17	Apply basic plane geometric principles of loci
18	Perform conversions between coordinate systems
19	Apply fundamentals of trigonometric functions and co-functions to right triangles
20	Apply the Law of Sine and the Law of Cosine to oblique triangles

21 Solve problems involving compound angles

22 Use scientific calculators

Program **ELECTRICAL TECHNOLOGY**

MTH 150 **TECHNICAL ALGEBRA I** **Credit** **3.0**

45 Hours

Course Description

This course includes the study of algebraic techniques which includes signed numbers, scientific notations, exponents, algebraic expressions, linear equations, systems of equations and concepts of right

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Perform operations with signed numbers

2 Demonstrate a knowledge of powers of 10, scientific notation, units and prefixes

3 Demonstrate a knowledge of properties of numbers

4 Explain and apply the Laws of Exponents

5 Demonstrate a knowledge of four math functions of algebraic expressions

6 Perform operations with linear equations, graphing, transposing

7 Explain, demonstrate and apply knowledge of Systems of Equations, Methods of Solutions, Determinants

8 Apply basic concepts of right angle trigonometry

9 Use scientific calculators

Program **ELECTRICAL TECHNOLOGY**

MTH 160 **TECHNICAL ALGEBRA II** **Credit** **3.0**

45 Hours

Course Description

This course expands on the algebraic principles of MTH 150 to include the study of factoring, algebraic fractions, fractional equations and quadratic equations. Applications to electronics technology are

Prerequisite: MTH 150

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Demonstrate the principles of factoring polynomials

2 Perform the basic operations of algebraic fractions

3 Solve and check fractional equations

4 Solve and check quadratic equations by three accepted methods

5 Investigate the origin of quadratic equations in the plane

6 Analyze the elements of a quadratic equation

7 Use scientific calculators

Program **ELECTRICAL TECHNOLOGY**

MTH 170 **CIRCUIT MATHEMATICS** **Credit** **3.0**

45 Hours

Course Description

This course develops the concepts of solutions for right angle trigonometry utilizing angles and sides, Pythagorean Theorem, trigonometric functions, and the solution of right triangles. It stresses the concepts of solutions of phasor algebra which includes elementary plane vectors converting rectangular to polar coordinates and polar to rectangular. The students will investigate and apply exponent and logarithmic

Prerequisite: MTH 150

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Perform operations involving right angle trigonometry-angles and sides-Pythagorean theorem-trigonometric functions-solve right triangles

2 Utilize Phasor algebra-rectangular and polar coordinate systems

3 Utilize logarithms

4 Apply concepts of logarithms

Program **ELECTRICAL TECHNOLOGY**

MTH 175 **ADVANCED TECHNICAL MATHEMATICS** **Credit** **6.0**

150 Hours

Course Description

This course is designed to familiarize individuals of varying ages and experience to fundamentals of arithmetic, geometry, algebra, and right angle trigonometry. Coursework involves solving problems after being presented basic concepts, definitions, terminology and solutions to sample exercises. The course progresses to more advanced mathematical applications in applied physics problems. The algebraic and trigonometric concepts introduced are essential in solving problems of this nature. The logarithmic functions are included for the understanding of time constants as applied to instrumentation, electricity, and the pH scale as it applies to chemistry. The student develops an understanding of statistical process control through exposure to basic statistics.

Prerequisites: None

Lecture: **Yes** Lab: **Yes** Experience: **No**

TASK LIST

1	Review the basics of arithmetic, emphasizing problems with fractions, decimals, prime numbers, and lowest common multiple
2	Identify and demonstrate knowledge of algebraic definitions, terminology, expressions, and order of operations
3	Work problems using algebraic rules of addition, subtraction, multiplication, and division
4	Solve simple to complex equations including the transposing of factors and formulas
5	Work with powers of 10, the prefixes which define powers of ten, and units and dimensions of the metric system
6	Solve problems that improve the ability to work with special products and factoring
7	Solve exercises containing fractions and fractional equations
8	Apply methods of graphing to physics, chemistry, and statistical control
9	Apply the study of geometry to areas and volumes as it applies to physics
10	Solve right angle triangles by using the specific ratios, which define trigonometric functions
11	Solve right triangles when given defined trigonometric ratios and calculate areas of triangles
12	Manipulate identities and useful relationships and solve triangles using the law of sine and the law of cosine
13	Identify the vector concept, the addition of vectors and the components of the vector
14	Determine the solutions to simultaneous equations, which use more than one variable
15	Study fundamental laws of exponents and radicals and use them to solve exercises
16	Solve quadratic equations by the process of factoring, completing the square, and the quadratic formula
17	Solve ratio and proportion problems as they apply toward physical quantities
18	Study radians and radian measurements as they apply to rotating objects

19 Graph the sine, cosine, and tangent functions

20 Solve exercises in the phasor or polar form--include the real number system and complex number system

21 Determine mean and standard deviation with the normal distribution of statistics

22 Study logarithms as they apply toward time constants and pH scale

Program **ELECTRICAL TECHNOLOGY**

MTH 199 **MATHEMATICS LABORATORY** **Credit** **1.0**

45 Hours

Course Description

The purpose of this course is to promote student success in mathematics by providing supplemental academic support such as extra class sessions, additional labs, tutoring, and/or increased monitoring. Mathematics Laboratory may be associated with any MTH course and may be repeated for each math course in the student's program of study.

Prerequisites: As required by the accompanying MTH course

Lecture: **No** Lab: **Yes** Experience: **No**

TASK LIST

1 Demonstrate understanding of competencies outlined in the MTH course associated with this laboratory.

Program **ELECTRICAL TECHNOLOGY**

MTH 200 **DIGITAL MATHEMATICS** **Credit** **3.0**

45 Hours

Course Description

This course provides the student with a working knowledge of digital mathematics and the application of mathematical ideas used to solve computer mathematical problems. Binary, octal, and hexadecimal number systems are covered as is Boolean algebra and its application to computer circuits.

Prerequisites: Consent of Instructor

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Demonstrate knowledge of basic mathematics and algebra

2 Apply the principles of algorithms in computer programs

3 Utilize different based number systems

4 Utilize number systems and codes

5 Demonstrate a knowledge of logic gates and Boolean algebra

6 Utilize combinational logic circuits

7 Perform digital arithmetic operations

8 Perform operations representing binary signed numbers

Program **ELECTRICAL TECHNOLOGY**

PHS 175 **APPLIED PHYSICS** **Credit** **6.0**

150 Hours

Course Description

This course is a basic study of the principles of physics and mechanics, including motion, force, vectors, work, energy, machines, properties of matter, behavior of fluids, temperature and heat, properties of gases, wave motion, electricity, light, and nuclear physics. Problem solving techniques are stressed.

Corequisite: MTH 175

Lecture: **Yes** Lab: **Yes** Experience: **No**

TASK LIST

1	Solve problems involving unit conversions
2	Define length, area, and volume
3	Distinguish between mass and weight
4	Solve problems involving scientific notation and significant digits
5	Distinguish between accuracy and precision
6	Understand the use of formulas in solving problems
7	Transpose formulas
8	Solve problems involving dimensional analysis
9	Express linear motion in terms of distance and direction
10	Describe quantities using vectors and scalars
11	Use vectors in solving velocity and acceleration problems
12	Analyze uniformly accelerated motion
13	Understand simple harmonic motion
14	Solve problems involving Newton's Law of Inertia
15	Solve problems involving Newton's Law of Acceleration
16	Understand the effects of friction
17	Analyze forces in one dimension
18	Solve problems involving weight, mass, and gravity
19	Solve problems involving Newton's Law of Action and Reaction
20	Distinguish between momentum and impulse

21 Solve problems involving conservation of momentum

22 Solve problems involving right-triangle trigonometry

23 Understand vector notation and the Pythagorean Theorem

24 Solve motion problems using vector notation

25 Find the vector sum of concurrent forces graphically

26 Find the vector sum of concurrent forces using the component method

27 Understand equilibrium in one dimension

28 Analyze concurrent force situations using free-body diagrams

29 Distinguish between compression and tension

30 Distinguish between common and technical definitions of work

31 Solve problems involving work and power

32 Solve problems involving conservation of mechanical energy

33 Determine how energy is transferred using simple machines

34 Analyze efficiency and mechanical advantage of simple machines

35 Distinguish the three types of levers

36 Analyze the mechanical advantage of levers, the wheel-and-axle, the pulley, the inclined plane, and the screw

37 Distinguish between rectilinear, curvilinear, and rotary motion

38 Solve problems involving torque and rotary motion

39 Calculate centripetal force of moving objects

40 Find power in rotary systems

41 Analyze how gears and gear trains transfer rotary motion

42 Solve parallel force problems

43 State the conditions of equilibrium using torque concepts

44 Understand center of gravity

45 Describe the components of all matter

46	Distinguish between solids, liquids, and gases
47	Understand Hooke's Law and its application to industry
48	Solve problems involving density and specific gravity
49	Describe the behavior of fluids
50	Solve problems involving Pascal's Principle
51	Solve problems involving Archimede's Principle
52	Distinguish between gauge and absolute pressures
53	Understand fluid flow and Bernoulli's Principle
54	Distinguish between temperature and heat
55	Express temperature using different scales
56	Understand heat and heat transfer
57	Determine final temperature using the method of mixtures
58	Relate heat to the expansion of solids and liquids
59	Calculate heat required for change of state of solids, liquids, and gases
60	Use Charles' Law to determine thermal expansion of gases
61	Use Boyle's Law to determine volume changes of gases
62	Relate gas density to pressure and temperature
63	Determine characteristics of mechanical waves
64	Describe electromagnetic waves and the electromagnetic spectrum
65	Analyze sound waves and explain the Doppler effect
66	Describe the nature of electrical charges
67	Distinguish between conduction and induction
68	Use Coulomb's Law to find the force between charges
69	Describe the characteristics of electricity
70	Use Ohm's Law to solve electrical flow problems

71 Use electrical symbols to describe circuits

72 Determine current, voltage, and resistance in simple circuits

73 Understand the nature of cells and batteries

74 Analyze circuits with cells in series and parallel

75 Find electrical power in simple circuits

76 Describe the nature of magnetism and the magnetic effect of electrical circuits

77 Understand how induced magnetism and current are related

78 Distinguish between generators and motors, and describe the principles which apply to both

79 Express the nature and characteristics of alternating current

80 Understand the use of transformers in changing voltage

81 Apply inductance and inductive reactance in circuits

82 Apply capacitance and capacitive reactance in circuits

83 Understand the nature of light

84 Solve problems involving the speed of light

85 Contrast the wave and particle characteristics of light

86 Explain the laws of reflection and refraction

87 Understand the structure and properties of the atomic nucleus

88 Analyze problems of radioactive decay

89 Understand the principles of nuclear fission and nuclear fusion

90 Understand the principles of detection and measurement of radioactivity

Program **ELECTRICAL TECHNOLOGY**

PHX 150 **INTRODUCTORY PHYSICS** **Credit** **3.0**

45 Hours

Course Description

A non-calculus approach to the concepts and applications of the physical principles of force, work, rate, resistance, energy, power, force transformers and gas laws is presented in this course. Students are shown by examples, classroom demonstration, and laboratory experiments how these concepts are applied to the translational and rotational mechanical, fluidal, electrical and thermal energy systems. Problem solving techniques and scientific method are stressed throughout this course.

Prerequisite: MTH 120 or MTH 170

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 List the proper units in SI and USCS for the forcelike quantities in the five energy systems

2 Given two or more vectors, calculate the result

3 Given two force related quantities in a system, calculate the unknown quantity

4 Convert beween Fahrenheit and Celsius temperature scales

5 Calculate the conditions that must be met for equilibrium in each of the five energy systems

6 List the proper units in SI and USCS for the work quantities in the five energy systems

7 Given two work-related quantities in a system, calculate the unknown quantity

8 State in writing the difference between latent heat and sensible heat

9 List the proper units in SI and USCS for the rate quantities in the five energy systems

10 Given rate related quantities, calculate the unknown quantity

11 Given the mass or weight of the object, the coefficient of friction, and the angle of incline, calculate the magnitudes of starting and sliding frictional forces

12 State in writing the factors contributing to electrical resistance in wires

13 State in writing the difference between potential energy, kinetic energy and conservation of energy using examples from the mechanical and electrical energy systems

14 Given two energy related quantities, calculate the unknown quantity

15 List the proper units in SI and USCS for power in the translational and rotational mechanical, fluidal and electrical energy systems

16 Given any two power related quantities, calculate the unknown quantity

17 Given any two of the following quantities in an energy system, calculate the third: input power, output power, efficiency

18 Convert values for power to equivalent values

19 Given all but one parameter, solve for the unknown quantity in mechanical advantage problems involving basic machines

20 State in writing the effect of a change in volume or temperature on the pressure of a gas in a closed vessel

21 Calculate conditional changes using the gas laws

Program **ELECTRICAL TECHNOLOGY**

TEC 010 **DEVELOPMENTAL WRITING FOR THE WORKPLACE** **Credit** **3.0**

45 Hours

Course Description

This course is designed to allow students to survey grammar and punctuation skills, which are essential to writing. Emphasis is on clarity and exactness as required to communicate effectively in today's

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Develop, improve and increase appropriate workplace vocabulary

2 Apply correct grammar and punctuation rules

3 Master the essentials of proper sentence structure as an aid to effective writing

4 Write paragraphs that are unified, coherent and adequately developed

5 Plan, draft, revise and write effective letters, memos and reports/records

Program **ELECTRICAL TECHNOLOGY**

TEC 100 **COMMUNICATION FOR BUSINESS & INDUSTRY** **Credit** **3.0**

45 Hours

Course Description

Instruction and experience is geared toward written and oral communication utilized in the workplace. Emphasis on clarity, correctness, conciseness, and effectiveness in preparing oral communication and business communications is integral. Listening skills, speaking techniques, and nonverbal

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Demonstrate proper grammar, usage, and mechanics

2 Write effective sentences and paragraphs

3 Develop spelling skills and vocabulary

4 Prepare written reports

5 Develop appropriate listening skills

6 Utilize speaking techniques

7 Demonstrate nonverbal communication skills

8 Develop and deliver prepared speeches

9 Prepare and present impromptu speeches

10 Write business communications

Program **ELECTRICAL TECHNOLOGY**

TEC 200 **TECHNICAL COMMUNICATIONS** **Credit** **3.0**

45 Hours

Course Description

Students will study written and oral communications in a technical environment. Emphasis is on preparing business communications, technical reports, technical instructions and proposals used in industry. Students also develop and prepare oral presentations. A review of basic grammar and writing principles is included. Students are introduced to electronic communication equipment and its functions.

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Recognize technical level of audience for all communications
2	Write grammatically correct sentences
3	Compose effective paragraphs
4	Draft business communications
5	Fill out job forms such as job orders, purchase orders and telephone messages
6	Prepare technical reports with visuals
7	Generate a set of technical instructions
8	Develop a proposal
9	Prepare and present oral reports with visuals
10	Demonstrate effective communication skills

Program **ELECTRICAL TECHNOLOGY**

TELE 100 **MECHANICS OF TELEPHONY*** **Credit** **3.0**

105 Hours

Course Description

This course provides instruction in the history of the telephone, regulations that impact the industry, analog transmissions and transmission mediums, and the evolution of wireless and digital services. Trainees will utilize the graduated height method for developing climbing skills and confidence. *Pilot

Prerequisites: None

Lecture: **Yes** Lab: **Yes** Experience: **No**

TASK LIST

1	Analyze general safety aspects, 5 protective equipment items, pre-climbing and post-climbing checks
2	Demonstrate ability to fit and wear climbers
3	Analyze and perform measures to test and maintain climbers
4	Demonstrate ability to properly inspect and use the Body Belt and Safety Strap
5	Be instructed and Demonstrate proper use of the climbers including but not limited to: safety precautions, positioning of hands and feet, step-up, step-off and clearing the pole
6	Demonstrate ability to climb unstepped poles to 6 foot level
7	Demonstrate ability to maneuver at 6 foot level
8	Complete work assignments at 6 foot level
9	Demonstrate ability to climb and maneuver at 12 foot level
10	Complete work assignments at 12 foot level
11	Demonstrate ability to climb and maneuver at 18 foot level
12	Complete work assignments at 18 foot level
13	Demonstrate ability to climb and maneuver on stepped poles
14	Perform checks for physical hazards
15	Perform checks for electrical hazards using foreign Voltage Detector (FVD)
16	Describe the functions of the Loop, Central Office, Interoffice Facilities and customer premise equipment
17	Identify the following regulatory impacts: North American Numbering Plan, Wire Centers & Exchange Areas, Modified Final Judgment of 1984 and Divesture, Local Access Transport Areas (LATA),
17	Inter-exchange (IXC/IC/IEC), Telecommunications Act of 1996 Resellers
18	Describe the Electrical Principles of Transmissions, Analog Transmissions, Digital Transmissions (TDM), Transmission Mediums
19	Describe the operation of the telephone set

20 Describe operation of Local Loop including: Network interface, Drop, Serving Terminals (aerial/burial), Distribution Facility, Cross Connect Devices, Feeder Facility

21 Identify components of Central Office: Main Distribution Frame, Power, Switching Systems

22 Identify Business Telecommunications Systems

23 Describe wireless operation of pagers, cell phones and microwave

24 Describe the following: Frame Relay, ATM, Fiber in the loop, ISDN, ADSL/DSL, LAN/MAN/WAN, Internet & ISP's

Program **ELECTRICAL TECHNOLOGY**

TELE 101 **BASIC INSTALLATION AND MAINTENANCE*** **Credit** **3.0**

105 Hours

Course Description

This course is designed to present an overview of concepts needed to complete the duties of a service technician and to provide the foundational basic skills and knowledge required to effectively perform the installation and maintenance job duties and functions. An introduction will be given to fiber optic transmissions and cable repair. * Pilot course - seeking approval.

Prerequisites: None

Lecture: **Yes** Lab: **Yes** Experience: **No**

TASK LIST

1	Complete an introduction to telephony
2	Describe the roles and responsibilities of a service technician including: company values, ethics, quality, and customer service
3	Analyze and perform the following tool and safety procedures: selecting proper tools, safe use of hand tools, electrical hazards, environmental hazards, and electrical safety testing equipment
4	Describe job planning including pre-wiring, local loops, and reading service orders
5	Perform task with the following wire: ASW, BSW, IW
6	Perform proper attachments to wood, sheet rock, and masonry
7	Describe and plan installations for mobile homes with special emphasis on safety
8	Analyze National Electric Code grounding laws
9	Plan and install services to recreational vehicles
10	Introduce fiber optic transmissions and cable repair

Program **ELECTRICAL TECHNOLOGY**

TELE 102 **SAFETY IN THE WORKPLACE*** **Credit** **2.0**

30 Hours

Course Description

This course is an introduction to hazardous materials and everyone's responsibility in handling these materials, safe driving skills, attitudes, and concepts, and first aid basics. This course is designed to instruct the student on how to handle various situations that may be encountered in the workplace.*Pilot

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Identify MSDS
2	Introduce environmental responsibilities
3	Provide overview of hazardous materials and wastes
4	Discuss spills and releases
5	Describe the management of hazardous materials and wastes at the work center
6	Identify safe and unsafe driving skills
7	Improve decision-making process as events unfold
8	Identify a health emergency
9	Identify when first aid is needed
10	Demonstrate basic first aid skills
11	Demonstrate knowledge of CPR

Program **ELECTRICAL TECHNOLOGY**

TQX 110 **TOTAL QUALITY MANAGEMENT** **Credit** **3.0**

45 Hours

Course Description

In this course students are introduced to the skills necessary to implement and use TQM (Total Quality Management) techniques. Students will be given the theory and evolution of TQM; practice problem solving techniques, make decisions based on data collection, work as teams, troubleshoot and demonstrate knowledge of implementing continuous improvement processes.

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1 Identify who defines quality of a product

2 Identify the reasons for the decline of productivity and quality in the United States

3 Write a personnel commitment to adopting a quality philosophy in life

4 Identify customers

5 Identify types of customers

6 List common characteristics of quality

7 Define continuous improvement

8 Define quality seen by the customer

9 Explain how customers are within and outside of the process

10 Explain how teams need to be the driving force in analyzing customer needs and making process improvements

11 Define the concept team

12 Explain the stages of teamwork

13 Practice consensus decision making to solve a problem

14 Utilize teamwork problem solving techniques

15 Explain the benefits of teamwork

16 Brainstorm to solve a problem

17 Utilize an Affinity Diagram to generate creative ideas

18 Display and develop thoughts and plans using a Storyboard process

19 Use the National Group Techniques to solve a problem

20 Define the concept of a Force Field Analysis chart

21 Determine the specific steps in developing a Force Field Analysis Chart

22 Analyze a problem or situation by using Force Field Analysis

23 Reach a decision using Force Field Analysis

24 Identify decision making as an everyday process

25 Describe barriers to effective communication

26 Describe signs of ineffective decision making

27 Describe decision making styles

28 Apply the decision-making process

29 Define the concept and purpose of a flow chart

30 Determine/list the specific steps (order) within a process or sequence

31 Arrange a series of steps or events using a flow chart diagram

32 Demonstrate knowledge of theory and mechanics in developing a process flow chart

33 Define the purpose of a cause and effect diagram

34 Determine the steps necessary to develop a cause and effect diagram

35 Analyze the significant causes of a problem or opportunity

36 Practice using a cause and effect diagram when analyzing casual relationship

37 Demonstrate the use of a Pareto Diagram to analyze data in problem solving solutions

38 Demonstrate the use of a Histograms to analyze problem solving data and variable data

39 Demonstrate use of Correlation/Scatter Diagrams

40 Demonstrate use of data collection Check Sheets that most effectively display facts

41 Conduct surveys that most effectively display facts

42 Demonstrate use of pie charts to display facts

43 Demonstrate use of bar charts to display facts

44 Demonstrate use of line charts to display facts

45 Construct a Run Chart to display data

46 Interpret Control Chart patterns

Program **ELECTRICAL TECHNOLOGY**

WPP 200 **WORKPLACE PRINCIPLES** **Credit** **3.0**

45 Hours

Course Description

Workplace Principles examines the changing workforce and the skills needed to adapt to constantly changing demands and expectations. The course includes but is not limited to problem solving, teamwork, time management, and self-management skills. Job-seeking and job-retention skills are taught through the development of resumes and job search materials. Maximum benefit is received if this course is taken in the latter part of the student's course work.

Prerequisites: None

Lecture: **Yes** Lab: **No** Experience: **No**

TASK LIST

1	Describe and apply the problem-solving processes independently and in groups
2	Describe the importance of teamwork and apply teamwork skills
3	Identify barriers to full team participation (sexual harrassment, diversity, americans with Disabilities Act, inhibiting behaviors)
4	Apply conflict resolution skills in team situations (I.e., workplace violence)
5	Describe the importance of time and self-management in the workplace
6	Describe personal performance skills (i.e., appropriate dress, business protocol, personality traits, customer relations skills, and professional behavior)
7	Describe the steps to take advantage of transition opportunities (i.e., lifestyle change, employment change)
8	Develop an employment portfolio including a cover letter, resume, and reference page
9	Identify sources for job leads and employer contacts
10	Complete application forms
11	Prepare and practice for job interviews
12	Practice job follow-up strategies (job acceptance and job rejection)
13	Review pre-employment tests
14	Identify policies and procedures for a drug-free workplace, workers compensation, Family Medical Leave Act, grievance policy, unemployment compensation and business ethics