

Elec Automat and Robotic Tech (EART)

EART 1050

Applied Electrical Math For EART Technicians

5:5:0 **Fall, Spring**

* Corequisite(s): EART 1130 and EART 1180

Utilizes basic algebraic formulas to calculate voltage, resistance, capacitance, and power. Covers the use of trigonometry for finding volt-amperes, reactance, and watts in AC circuits. Uses phasors, graphs, and sign waves to analyze electronic circuits. Software fee of \$20 applies. Lab access fee of \$35 for computers applies.

EART 1130

Basic Electrical Theory for EART Technicians

4:4:0 **Fall, Spring**

* Corequisite(s): EART 1050 and EART 1180

Covers basic DC and AC theory involving voltage, current, resistance, batteries, magnetism, reactance, power and the use of digital meters. Includes the study of series, parallel, and complex circuits, and troubleshooting techniques. Studies both DC&AC motors and AC transformers. Explains the Reaction Theory of inductance, capacitance, and resistance dealing with L.C.R. circuits. Includes basic Digital Fundamentals of binary number systems and logic gates. Software fee of \$20 applies. Lab access fee of \$35 for computers applies.

EART 1180

Basic Electrical Lab for EART Technicians

5:0:15 **Fall, Spring**

* Corequisite(s): EART 1130, EART 1050

Emphasizes lab experiences in basic DC/AC theory such as voltage, current, resistance, batteries, magnetism, wire sizing, splicing, soldering, and conduit bending, troubleshooting, Ohm's Law, series/parallel circuits, combination circuits, capacitors, inductors, resistors, and L.C.R. circuits. Includes safety procedure, basic electrical tools, and electrical symbols. Introduce industrial, commercial, and residential wiring techniques to include contactors, single pole switches, 3 & 4 way switching, low voltage controls, electronic door locks, fire alarm systems, breakers, and panels. Software fee of \$20 applies. Lab access fee of \$35 for computers applies. Course Lab fee of \$25 for materials applies.

EART 1250

Electrical Wiring and Code

2:1:3 **Fall, Spring**

* Prerequisite(s): EART 1130, 1050, and 1180; or departmental approval

Covers the National Electrical Code using theory, specifications, blueprints and installation methods pertaining to residential, commercial, and industrial applications. Includes lectures and lab experiences. Software fee of \$18 applies. Lab access fee of \$35 for computers applies.

EART 1260

Logic

2:1:3 **Fall, Spring**

* Prerequisite(s): EART 1130, EART 1050, and EART 1180; or departmental approval

For students who desire a basic understanding of Digital Logic systems. Covers the basic logic levels, the 1's and 2's complement. Studies binary, decimal, octal, and hexadecimal numbers. Includes problems using Boolean Algebra, and DeMorgan's theorems. Teaches how to minimize combinational gates and troubleshoot logic circuits. Includes lecture, demonstrations, and lab work emphasizing hands-on lab experiments using logic gate circuits. Software fee of \$18 applies. Lab access fee of \$35 for computers applies.

EART 1280

DC and AC Machines for EART Technicians

5:5:0 **Fall, Spring**

* Prerequisite(s): EART 1130, EART 1050, and EART 1180; or departmental approval

* Corequisite(s): EART 1285

Covers installation, controls, troubleshooting, preventive maintenance, and repairs on DC/AC motors, generators, and control systems. Introduces the students to ladder logic, controls, sensors, overloads, and electronic devices used to control DC/AC Machines. Supports hands-on labs and projects in EART 1285. Software fee of \$20 applies. Lab access fee of \$35 for computers applies.

EART 1285

DC and AC Machines Lab for EART Technicians

4:0:12 **Fall, Spring**

* Prerequisite(s): EART 1130, EART 1050, EART 1180

* Corequisite(s): EART 1280

Trains students in the proper use of tools and test equipment needed to maintain motors and their controllers. Emphasizes the use of schematics, line diagrams, ladder logic, pictorial diagrams to wire, design, and repair electrical systems, and DC/AC Machines. Covers how DC, AC, single phase, and three phase motors work and the workings of single phase and three phase transformers used in wye and delta configurations. Course Lab fee of \$14 for supplies/materials applies. Lab access fee of \$35 for computers applies. Software fee of \$20 applies.

EART 2110

Industrial Electronics for EART Technicians I

6:4:6 **Fall, Spring**

* Prerequisite(s): EART 1280, and EART 1285; or departmental approval

* Corequisite(s): EART 2250

Introduces students to semiconductor theory including practical labs. Covers the concepts of PN junctions, transistors, voltage amplifiers, diodes, and other special semiconductors. Software fee of \$20 applies. Course Lab fee of \$29 for materials applies. Lab access fee of \$35 for computers applies.

EART 2150

Industrial Hydraulics and Pneumatics

3:2:3 **Fall, Spring**

* Prerequisite(s): EART 1280, EART 1285, EART 2250, or departmental approval

* Corequisite(s): EART 2270

Covers the fundamentals of hydraulic and pneumatic components and systems used in industrial applications. Studies pumps, motors, directional and flow control valves, cylinders, transmission, and fluids. Emphasizes maintenance, safety, and environmental problems. Examines troubleshooting techniques and blueprint/print reading. Completers should be able to work with hydraulic and pneumatic systems in correlation with related industrial electrical applications at entry-level jobs in the electrical maintenance field. Includes lecture, demonstration, and lab work. Course Lab fee of \$15 for supplies/materials applies. Software fee of \$20 applies. Lab access fee of \$35 computers applies.

EART 2160

Industrial Electronics for EART Technicians II

5:3:6 **Fall, Spring**

* Prerequisite(s): EART 2110 or departmental approval

* Corequisite(s): EART 2270

Teaches the theory and operation of industrial solid state thyristor devices, power circuits, integrated circuits, operational amplifiers, and AD/DC motor devices. Competence in industrial controls with solid state circuits, amplifiers, and variable speed drives will be obtained by the student. Course Lab fee of \$11 for materials applies. Software fee of \$20 applies. Lab access fee of \$35 computers applies.

Course Descriptions

EART 2250

Industrial Programmable Logic

Controllers--PLCs

5:3:6

Fall, Spring

* Prerequisite(s): EART 1280, EART 1285

* Corequisite(s): EART 2110

Covers the theory, programming and industrial control system applications of small and medium sized programmable logic controllers (PLCs). Studies basic maintenance and troubleshooting techniques for programmable logic controllers. Includes lecture, demonstration, print reading, and lab projects with hands-on experience. Completers should be able to work in industry in related work at entry level positions with safety and environmental awareness. Course Lab fee of \$90 for equipment applies. Software fee of \$20 applies. Lab access fee of \$35 for computers applies.

EART 2260

Advanced Logic

3:2:3

Fall, Spring

* Prerequisite(s): EART 1260 or departmental approval

* Corequisite(s): EART 2160

Covers theory and industrial applications of Comparators, Decoders, Encoders, Multiplexers, Demultiplexers, Latches (SR and D), Flip Flops (SR, D, and JK), One-shots, Timers, Counters, and Shift Registers. Includes lecture, demonstrations, and lab projects with hands-on experience. Emphasizes implementation and troubleshooting of logic circuits. Completers should be able to work in industry in related work at entry level positions with safety and environmental awareness. Course Lab fee of \$15 for materials applies.

EART 2270

Industrial Programmable Automation

Controllers--PACs

6:4:6

Fall, Spring

* Prerequisite(s): EART 2250 or Departmental Approval

* Corequisite(s): EART 2160, EART 2150

Covers the theory, implementation, and application of advanced Programmable Logic Controller instructions, functions, programming techniques, and data communications. Studies basic programming language and industrial control applications. Includes lecture, demonstrations, and lab projects with hands-on experience. Completers should be able to work in an industrial automated environment. Course Lab fee of \$90 for equipment applies. Software fee of \$20 applies. Lab access fee of \$35 for computers applies.

EART 281R

Cooperative Work Experience

1 to 8:1 to 8:0

Fall, Spring, Summer

* Prerequisite(s): Approval of Department Chair

Provides paid on-the-job work experience that relates to Electrical Automation and Robotics Technology (EART) in the student's major. Work experience, the related class, and enrollment are coordinated by the EART Cooperative Coordinator. Completers must individually set and complete goals/learning objectives based on the job description from their work assignment. May be graded credit/no credit.

EART 285R

Cooperative Correlated Class

1:1:0

Fall, Spring, Summer

* Prerequisite(s): Approval of Department Chair

Designed to identify on-the-job problems and to remedy those problems through in-class discussion and study. Focuses on preparing for, participating in, and utilizing the experiences available from working in a cooperative education/internship program.