ELEC A174: ELECTRONICS LABORATORY 4

Item	Value
Curriculum Committee Approval Date	02/12/2014
Top Code	093400 - Electronics and Electric Technology
Units	1 Total Units
Hours	54 Total Hours (Lab Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)

Course Description

Fourth semester laboratory develops technical and leadership skills essential for the Industrial Automation Technician, including design, strategic planning, problem solving, and project management. Students will demonstrate the ability to oversee project through the entire process, from design through commissioning of complex systems per client specifications. PREREQUISITE: ELEC A245 or ELEC A253 or ELEC A260 or concurrent enrollment. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Perform entry-level maintenance, calibration, and diagnostic procedures on control systems.
2. Generate technical reports to approved Engineering Technology standards.

Course Objectives

- 1. Demonstrate proficiency of laboratory skills sets necessary for an Industrial Automation Technician: safety, tools and equipment, assembly skills, and project management.
- 2. Demonstrate proficiency of laboratory skills sets: Test equipment, Procedures, Prototype development.
- 3. Engineering technology design: mechanical, electrical, electronic, programming, to specifications established by the projects assigned by the instructor/client.
- 4. Develop self-evaluation skills to troubleshooting skill development progress.
- 5. Project management and leadership through prototype development and documentation to industry standards.
- 6. Demonstrate safe working practices in an industrial setting

Lecture Content

NA

Lab Content

ELEC A245 Projects Introduction to FOX Trainer FOX Trainer and Oscilloscope 280 Internal Registers and Load Instructions Arithmantic and Logic Instructions Subroutines, Stack, and Interrupt Instructions Programming Methods and Operating Systems traffic Signal Program Parallel Interfacing with 8255 FOX Keyboard Read Routine Serial Communication and D/A and A/D Converstion ELEC A253 Projects PLC Architecture Simple PLC Motor control Ladder Logic programming Digital I/O Devices Closed Loop Digital I/O Design Project Analog Inputs Sequential vs. Synchronous Systems Facilities Management Engineering Review Duty Roster Assignment Status Reports Engineering Review Discovery Goals and objectives identification Design Reveiw Prototype development Diagnostics Status Reports Production Procurement Fabrication Assembly Installation Commissioning Post Review

Method(s) of Instruction

- Lab (04)

Instructional Techniques

This laboratory will provide an opportunity for students to practice advanced skills essential for success in the workplace. They will complete projects discussed and assigned in Elec A245 and Elec A253. Instructors will provide Quality Assurance monitoring and engineering reviews of student design projects to ensure skill development.

Reading Assignments

Assigned from instructor handoutsIndustry technical documents

Writing Assignments

Journal Weekly log of lab hours Produce engineering documentation for the assigned projects

Out-of-class Assignments

Not required for lab-only course

Demonstration of Critical Thinking

Participation: Performance and participation in laboratory assignments Engineering Review Board made up of students peers will provide feedback of the individual studetns team participation Skills Proficiency Projects evaluated per industry standards and design criteria Communication Documentation Engineering Journal will be review by instructor during each class session, and at the end of the semester Demonstrate the ability to research specifications and engineering solutions. Technical Report Demonstrate the ability to discuss: mission critical objectives, Team goals, system operation, assembly and test procedures.

Required Writing, Problem Solving, Skills Demonstration

Journal/ Weekly log of lab hoursProduce engineering documentation for the assigned projectsDemonstrate the ability to discuss at a advanced level: mission critical objectives, Team goals, system operation, assembly and test procedures.Demonstration of project managment skills required to complete project/deliverable.

Eligible Disciplines

Electromechanical technology (industrial mechanical technology): Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience. Electronics: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience. Engineering:

Masters degree in any field of engineering OR bachelors degree in any of the above AND masters degree in mathematics, physics, computer science, chemistry, or geology OR the equivalent. (NOTE: A bachelors degree in any field of engineering with a professional engineers license is an alternative qualification for this discipline.) Masters degree required. Title 5, section 53410.1 Engineering technology: Masters degree in any field of engineering technology or engineering OR bachelors degree in either of the above AND masters degree in physics, mathematics, computer science, biological science, or chemistry, OR bachelors degree in industrial technology, engineering technology or engineering AND a professional engineers license OR the equivalent. Masters degree required.

Other Resources

1. Instructor handouts