ELEC A173: ELECTRONICS LABORATORY 3

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

Third semester laboratory will develop essential skills for a Test Technician: research, documentation, prototype construction, diagnostics methods and, critical thinking skills. Students will work on A/C circuit, robotics and/or semiconductor circuit for motor control projects. They will develop essential skills for a Test Technician: research, documentation, prototype construction, and diagnostics methods. PREREQUISITE: ELEC A135, ELEC A155, ELEC A260 or concurrent enrollment. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Demonstrate the fundamental mechanical skills for electro-mechanical production technicians
2. Perform routine maintenance of facilities and equipment without supervision
3. Demonstrate the fundamental skill necessary for electronic assembly.
4. Demonstrate safe working practices in an industrial environment.

Course Objectives

- 1. Demonstrate safe working practices in an industrial environment.
- 2. Demonstrate proficiency in the selection and use of proper tooling and equipment for the assigned applications.
- 3. Construct intermediate electrical, electronic, electro-mechanical, instrumentation, robotic, and automation systems
- 4. Develop diagnostic and troubleshooting skills, analyze, evaluate and diagnose systems functions per specifications.
- 5. Generate technical reports to approved Engineering Technology standards.
- 6. Collaborate with other members of the technical team.
- 7. Develop leadership skills.

Lecture Content

Not applicable

Lab Content

Diagnostics Skills Test procedure Following a test procedure Documentation of Test Data results Modification of test procedures: Engineering Change Order (ECO) Analysis of Test Data results Technical documentation Drawings Technical Reports Diagnostics Testing Development of Test Procedures Troubleshoot and repair assembly faults Redesign for improved performance of: Assembly methods Test methods Modify circuit design: ECO Leadership Teamwork Laboratory Duties Perform assigned and scheduled shop maintenance on: Facilities Test equipment Tools Inventory Control Leadership Safety Standards Maintenance duties Documentation standards Journal Portfolio Ships Log Engineering Review Duty roster assignments rotations Crew status report The crew leader is responsible for: Completion of crew members duty roster assignments Project assignments are completed on time. Project assignments meet Client specifications Prototype Development 1 Engineering Review -- Client Specifications Systems Engineering Assignments Crew selection Project status report ECO approval process Prototype design construction B.O.M. design procurement Crew assignments Crew instruction Assembly W.I.P. inspection Prototype Diagnostics Development of Test Procedures Troubleshoot and repair assembly faults Redesign for improved performance of: Assembly methods Test methods Modify circuit design: ECO Engineering Review Project Status Report ELEC A155 projects Oscilloscope Familiarization Oscilloscope Practice Oscilloscope Techniques Internal Resistance A.C. Circuits Phase Angle Measurements Inductive Reactance A. C. Impedance RC Phase Shift Circuit Parallel RC Circuit Capacitor Time Constant Series Resonance Parallel Resonance

Method(s) of Instruction

- Lab (04)

Instructional Techniques

This laboratory will provide an opportunity for students to practice intermediate skills essential for success in the workplace. This laboratory will provide an opportunity for students to practice fundamental skills essential for success in the workplace. They will complete projects discussed and assigned in Elec A135, Elect A155 and Elect A260 (as needed). Instructors will provide Quality Assurance monitoring and engineering reviews of student design projects to ensure skill development

Reading Assignments

Instructor handouts Industry technical documents

Writing Assignments

Writing assignments 1) Keep a journal 2) keep a weekly log

Out-of-class Assignments

Not required for lab-only course

Demonstration of Critical Thinking

Regular attendance is required Performance and participation in laboratory assignments Wwork planning and project troubleshooting

Required Writing, Problem Solving, Skills Demonstration

Student will maintain a journal related to the problems they encountered, potential solutions and ultimate resolution. Students will also keep a weekly log of all hours in the lab. Student will demonstrate the ability to discuss at an intermediate level: mission critical objectives, Team goals, system operation, assembly and test procedures.

Eligible Disciplines

Electronic technology (radio, television, computer repair, avionics): 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. Selected handout materials to be provided and distributed by the instructor.