

## Master Syllabus

### EGR 2231 - Troubleshooting of Automated Systems

**Division:** Science, Mathematics and Engineering

**Department:** Automation and Control Technology

**Credit Hour Total:** 3.0

**Lecture Hrs:** 2.0 **Lab Hrs:** 3.0

**Prerequisite(s):** EET 2281AND EGR 1128

**Date Revised:** December 2013

---

#### Course Description:

Concept of troubleshooting and its importance in manufacturing systems. Troubleshooting philosophies, flowchart examination, electrical and mechanical troubleshooting. Techniques for troubleshooting systems containing sensors, PLCs, Robots, HMIs and other common automation equipment. Fault determination using software to monitor the performance of small automated systems. Two classroom, three lab hours per week.

#### General Education Outcomes:

- Critical Thinking/Problem Solving Competency
- Information Literacy Competency

#### Course Outcomes:

##### Troubleshooting philosophy

Comprehend that the definition of troubleshooting is the process of finding the first electrical or mechanical malfunction of any component part on which the normal operation of the system is dependent.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

Score greater than 70% correct

##### Automated system repair

Given simulated troubleshooting problems on the computer, identify the problem and successfully repair it.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

Score greater than 70% correct

**Assessment Method:** Simulations

**Performance Criteria:**

Score "17.5" or higher on five by five rubric

##### Common faults in automation

Recognize and understand how to fix common problems leading to the shortest downtime.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

Score greater than 70%

**Assessment Method:** Simulations

**Performance Criteria:**

Score "17.5" or higher on five by five rubric

##### Breaking down complex systems

Determine the location of the fault and repair systems while still on line.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

Score greater than 70%

**Assessment Method:** Simulations

**Performance Criteria:**

Score "17.5" or higher on five by five rubric

##### Process breakdown information

Demonstrate the proper sequence for troubleshooting: 1) Get the information from the operator 2) examine the equipment 3) perform preliminary checks 4) thoroughly test suspected items 5) repair the problem 6) document the problem and repair.

**Assessment Method:** Behavioral observations

**Performance Criteria:**

Score "17.5" or higher on five by five rubric

**Assessment Method:** Locally developed exams

**Performance Criteria:**

Score greater than 70% correct

**Outline:**

Intro to troubleshooting

Troubleshooting philosophies

Using a flowchart

Troubleshooting using computer simulations

Common faults in automated systems

Narrowing down faults in large systems

Troubleshooting while online

Computer based troubleshooting - ideal cycle compared to fault cycle