Revised: Fall 2016

ELE 225
Electrical Control Systems
COURSE OUTLINE

Prerequisites:

Prerequisite: MTE 1, 2 and 3. Co-requisite: ELE 130, ELE 133, ELE 130 or ETR 113 or approval from Program Head.

Course Description:

Studies components, equipment and circuits that are used to control the operation of electrical machines. Explains the physical and operating characteristics of various electromagnetic, static, and programmable control devices. Investigates control schemes used to accomplish specific control objectives.
Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.
4 credits

Semester Credits: 4 **Lecture Hours: 3 Lab/Recitation Hours: 3**

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ELE 225, Electrical Control Systems

Course Outcomes

At the completion of this course, the student should be able to:

1. Define the basic units for electrical voltage, current, resistance, energy and power.
2. Discuss the basic concepts of control systems.
3. Describe and compare the different terminology of control systems.
4. Describe types of controls.
5. Recognize configurations components.
6. Cite examples of hazardous situations.
7. Identify hazards associated with electrical work.
8. Explain basic safety rules.
9. Describe safety equipment and protective clothing.
10. Describe measurement instrument characteristics.
11. Identify and describe signal conditioning.
12. Identify and interpret the different types of sensors and manipulation devices
13. Identify logic functions when applied to an electrical circuit
14. Discuss control of continuous processes
15. Describe and evaluate process characteristics
16. Describe and evaluate applications and installation of control devices
17. Interpret and discuss methods of analysis
18. Evaluate and assess the methods employed to mitigate injury and the danger of working with high voltages
19. Identify career opportunities and training requirements in the areas within the industry
20. Identify the concerns for the future of control devices

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Required Materials:

None

Textbook:

1. 1. **Technicians Guide to Programmable Controllers, 5**/E, Cox & Borden, Cengage Learning, ISBN # 9781401890070

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Topical Description:

Week	Topic
1	Review basic units of electrical voltage, current, energy, and power. Overview of electric motors, solenoids, and relays.
2	Safety. Provide a basic knowledge of electronic control systems and PLCs.
3	Inputs and outputs. Intro to sensors.
4	Processors and programming devices
5	Memory
6	Digital logic and ladder diagrams
7	Relay type instructions
8	Programming a PLC
9	Specific applications of control systems
10	
11	
12	Write PLC programs
13	
14	
15	Final Exam

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Notes to Instructors

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