IND204 Electrical Control Systems II Syllabus

Course Information

Credits 3
Campus Washburn Institute of Technology (Forbes Facility)
Address 6530 SE Forbes Avenue
City/State/Zip Topeka, Kansas 66619
Office Fax 785-670-2734

Description
This course provides an understanding of Reversing Motor Circuits, Solid State Devices and System Integration, Timing and Counting Functions, Relays and Solid State Starters, Sensing Devices and Controls. Hands on Labs help guide student learners to assimilate this material.
Prerequisite: IND152 or consent of instructor.

Textbooks

Student Learning Outcomes:
A. Communicate effectively
B. Integrate technology
C. Learn effectively
D. Demonstrate cooperative teamwork skills
E. Apply safety in the workplace
F. Think critically and creatively
G. Demonstrate responsible work ethics

Competencies
1. Demonstrate with a multimeter the effects of forward and reverse biasing.
2. Describe how a transistor works; base/emitter junction forward biased; base/collector junction reverse biased.
3. Describe how silicon controlled rectifier (SCR) works.
4. Discuss solid state relays (SSR) and their switching methods. 1 zero switching, 2 instant on. 3 peak switching, 4 analog switching.
5. Explain photoelectric switch scanning techniques. 1 direct scan. 2 retroreflective, 3 polarize. 4 specular. 5 diffuse. 6 convergent beams.
6. Describe photoelectric sensors; and inductive and capacitive proximity sensors.
7. Demonstrate troubleshooting a three phase motor reversing circuit.
8. Demonstrate the ability to connect, program and operate ON/OFF delay relay
9. Demonstrate the ability to troubleshoot timers and relays
10. Explain differences between thermocouples and RTD's.
11. Demonstrate ability to connect and operate counters.
12. Demonstrate the ability to connect, operate and troubleshoot sensors and pilot devices
13. Design, connect, operate and troubleshoot a timed one-shot and a timed repeat cycle motor control circuit.
14. Design a delta-to-wye bank configuration using three single phase transformers.

Guidelines for Success

Assessment Plan
Assessment is an integral part of the educational process at Washburn Tech and accurate feedback is an important tool in continuously improving the institution’s technical programs. Students can expect to participate in assessment activities prior to entry into programs, within specific courses and following program completion for specific fields of study.

Grading Rationale
Class sessions and assignments will include daily homework, in-class review of homework, quizzes. Grades will be based on: Attendance and general participation, daily homework, quizzes and tests and final exam.

Grading Scale
90% or higher A
80% to 89% B
70% to 79% C
60% to 69% D
Less than 60% F

Attendance
Tardies and absences will affect the daily grade for attendance. Students who miss class should inform the instructor beforehand whenever possible, and are responsible for course content, for turning in any required homework, and for taking the initiative to make up any missed tests, labs or quizzes.
Disability
The Special Support Services (SSS) Office is responsible for assisting in arranging accommodations and for identifying resources at Washburn Institute of Technology for persons with disabilities. Qualified students with disabilities MUST register and provide documentation with the office to be eligible for services. New requests for accommodations should be submitted two months or more prior to the date services should begin; however, contact the SSS Office as soon as a need may arise. Depending on the accommodation request, four to eight week lead time may be needed for timely and effective provision of services. SSS coordinates and assist in arranging services it deems appropriate of eligible students on a case-by-case basis.

If you are a student with a disability that may substantially limit your ability to participate in this class and believe you will need accommodations, it is your responsibility to contact:

Special Support Services Coordinator
Phone: 785-228-6356
E-Mail: ssscoordinator@washburn.edu