ELE135 Commercial Wiring I Syllabus

Course Information

Credits 4
Campus Washburn Institute of Technology
Address 5724 SW Huntoon
City/State/Zip Topeka, Kansas 66604
Office Fax 785-273-7080

Description
An introductory course on commercial wiring methods that includes practical applications and hands-on experience in implementing code requirements. The course consists of definitions, formulas, wiring method, overcurrent protection, calculation, and sample examinations. Wiring projects are assigned to put the theories learned in the classroom into practice.

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. Identify various types of feeder/branch circuit wiring methods.
2. Perform conduit bending.
3. Identify and perform conductor installation.
5. Identify components of distribution equipment.
6. Identify the National Electrical Code requirements for grounding and bonding.
7. Perform service calculations per National Electrical Code.
8. Apply NFPA 70 E requirements.
9. Compute the radius, degrees in bend, developed length, and gain for conduit up to six inches.
10. Describe the different types of nonmetallic and metallic pull and junction boxes.
11. Properly select pull and junction boxes and their associated fittings.
12. Install pull and junction boxes and their associated fittings.
14. Describe the National Electrical Code regulations governing pull and junction boxes.
15. Understand the NEMA and IP classifications for pull and junction boxes.
16. Size pull and junction boxes for various applications.
17. Describe the purpose of conduit bodies and Type FS boxes.
18. Calculate loads for single-phase and three-phase branch circuits.
19. Size branch circuit overcurrent protection devices (circuit breakers and fuses) for non-continuous duty and continuous duty circuits.
20. Apply de-rating factors to size branch circuits.
22. Use load calculation to determine branch circuit conductor sizes.
23. Select branch circuit conductors and overcurrent protection devices for electric heat, air conditioning equipment, motors, and welders.
24. Select electrical conductors for specific applications,
25. Calculate voltage drop in both single-phase and three-phase applications.
26. Prepare conduit for installation by cutting, reaming, and threading.
27. Identify various types and sizes of raceways and fittings for a given application.
28. Select the proper raceways and fittings for a given application.
29. Identify various methods used to fabricate and install raceway systems.
30. Identify used permitted for selected raceways.
31. Demonstrate how to install a flexible raceway system.
32. Terminate a selected raceway system.
33. Identify the appropriate conduit body for a given application.
34. Install conductors in a raceway system.
35. Explain the importance of communication during a cable-pulling operation.
36. Plan a cable pull.
37. Set up a cable pull.
38. Set up reel stands and spindles for a wire-pulling installation.
39. Explain how mandrels, swabs, and brushes are used to prepare conduit for conductors.
40. Properly install a pull line for a cable-pulling operation.
41. Explain how and when to support conductors in vertical conduit runs.
42. Describe the installation of cables in cable trays.
43. Calculate the probable stress and tension on cable pulls.
44. Apply National Electrical Code regulations governing conductors to specific application.
45. Calculate National Electrical Code tap rules to a specific application.
46. Apply National Electrical Code tap rules to a specific application.
47. Size conductors for the load.
48. De-rate conductors for fill.
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
Student progress is evaluated by means that include, but not limited to: exams (60%), written assignments/labs (30%), and attendance/class participation (10%).

92-100%  A
84-91%  B
76-83%  C
68-75%  D
0-67%  F

Attendance
Classroom attendance is required. Material missed must be made up with instructor.

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