J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: ARC 242 **Credits:** 3

Course Title: Building Electrical Systems

Course Description: Studies components and design for lighting and electrical systems, security, fire, and smoke alarms. Lecture 3 hours per week.

General Course Purpose: Course introduces students to the principles of design and functions of electrical systems to buildings, including lighting, communications, security systems, and emergency backup systems. Course required for the Contemporary Technology for Design Specialization of the Architectural and Engineering Technology AAS degree.

Course Prerequisites and Co-requisites:
None

Student Learning Outcomes:
Upon completing the course, the student will be able to
a. Recognize the principles of electrical power service to a typical residential and commercial structure;
b. Recognize the importance of grounding an electrical service;
c. Identify how the electrical service is distributed throughout the building (transformer use and voltage levels for accessories like lights);
d. Recognize the necessity of proper switch, outlet, and fixture location;
e. Identify the requirements of appliance wiring including plenum and standard wiring as well as panel locations; and
f. Apply the knowledge to complex problems for wiring installations of residential and commercial construction.

Major Topics to Be Included:
a. Blueprint reading
b. Circuit calculations
c. System grounding
d. Circuit requirements
e. GFCI requirements
f. Outlet installation
g. Plenum wiring
h. Switch and fixture installation
i. Appliances and their impact on power requirements in a building design

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