SYLLABUS

DATE OF LAST REVIEW: 11/2014
CIP CODE: 46.0401
SEMESTER: Departmental Syllabus
COURSE TITLE: Residential Electrical
COURSE NUMBER: BPMT0112
CREDIT HOURS: 4
INSTRUCTOR: Departmental Syllabus
OFFICE LOCATION: Departmental Syllabus
OFFICE HOURS: Departmental Syllabus
TELEPHONE: Departmental Syllabus
EMAIL: Departmental Syllabus

KCKCC-issued email accounts are the official means for electronically communicating with our students.

PREREQUISITES: OSHA 10, Math Level 3 Recommended

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC bookstore, http://www.kckccbookstore.com/, for the required tests for your particular class.

COURSE DESCRIPTION:
This is the basic course in residential electrical and repair. The course topics include: Environmental sustainability, sources of electricity, meter reading, voltage, resistance, watts, current, home distribution systems, circuit breakers, and codes. It will also cover types of conductors, circuit loads, switches, outlets, boxes, fixtures, and wiring. Students will study surface mounted wiring, low voltage, door chimes, thermostats, telephones and burglar alarm systems. Safety will be emphasized.
METHOD OF INSTRUCTION:
A variety of instructional methods may be used depending on content area. They may include but are not limited to lecture, multimedia, cooperative/collaborative learning, demonstrations, labs, on-the-job, internships, and other learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:

I. Introduction – Sources of Electricity
II. How to Read a Meter
III. Electrical Energy
   A. Voltage
   B. Current
   C. Resistance
   D. \( \text{EQ}:\text{f}(V, AxR) \)
   E. Watt
      1. Formula
   F. Watt-Hour
      1. Formula
IV. The House Distribution System
   A. Service Line Cable
      1. Black Insulated
      2. Bare Cooper
      3. Simple Branch Circuits
   B. Circuit Breakers
      1. Amperage Capacity
      2. Short-Circuit
   C. Color Codes
      1. White Insulation
      2. Black Insulation
      3. Red Insulation
      4. Bare or Green
V. Types of Conductors
   A. NM
   B. VF
   C. Armored or Conduit
VI. Circuit Loads
   A. Size of Wire
   B. Length of Conductors
1. Formula
2. Special Circuits

VII. Switches
   A. 15A 125V
   B. 7½ A 250V

VIII. Wiring Switches
   A. Silent Switches
   B. Lighted Toggle Switches
   C. Dimmer Switches
   D. Three and Four Way Switches

IX. Duplex Outlets
   A. 3 Wire Polarized 3 Pole 3 Wire
   B. 3 Wire Grounding 2 Pole 3 Wire
   C. 4 Wire Grounding 3 Pole 4 Wire

X. Replacing Duplex Outlet or Switch
   A. Ten Step Process

XI. Ceiling Boxes

XII. Ceiling Fixtures
   A. Types

XIII. Surface-Mounted Wiring
   A. Types
   B. Four Step Installation

XIV. Low Voltage Circuits
   A. Heating and Cooling Thermostat
   B. The Step-Down Transformer
   C. Reduced Voltage

XV. Door Chime Failure
   A. Step Down Transformer
   B. Low Voltage
   C. Chime Check

XVI. Thermostat Controls
   A. Primary Control
   B. Placement
   C. Thermostat Operation

XVII. Checking Thermostat Mounting
   A. Level Thermostat
   B. Mounting

XVIII. Calibration of the Thermostat
   A. Six Step Process

XIX. Miscellaneous Wiring
A. Burglar Alarms
B. Telephone Wire

XX. Environmental Sustainability
A. Environmentally safe waste disposal.
B. Life cycle analysis.
C. Recycled material.
D. Low VOC emissions.
E. New “green” materials.
F. New “green” methods and practices.
G. “Low impact” designs.

EXPECTED LEARNER OUTCOMES:
A. The student will be able to describe and explain electrical energy.
B. The student will be able to describe and explain the house distribution system.
C. The student will be able to describe and explain types of conductor circuit loads.
D. The student will be able to describe and explain switches.
E. The student will be able to describe and explain duplex outlets.
F. The student will be able to describe and explain ceiling boxes and ceiling fixtures.
G. The student will be able to describe and explain low voltage circuits.
H. The student will be able to describe and explain thermostat controls.
I. The student will be able to describe and explain environmental sustainability.

COURSE COMPETENCIES:

The student will be able to describe and explain electrical energy.

1. The student will be able to describe and understand the term voltage.
2. The student will be able to describe and understand the term current.
3. The student will be able to describe and demonstrate an example of resistance.
4. The student will be able to describe and demonstrate the term watts.
5. The student will be able to describe and perform a voltage check.
6. The student will be able to describe and identify and demonstrate how to use an OHM meter.
7. The student will be able to describe and demonstrate safe electrical practices.

The student will be able to describe and explain the house distribution system.

8. The student will be able to describe and understand the service box system.
9. The student will be able to describe and perform a check of the service line cable.
10. The student will be able to describe and demonstrate safety practices.
11. The student will be able to describe and demonstrate a circuit breaker.
12. The student will be able to describe and perform a short circuit.
13. The student will be able to describe and demonstrate color coding.
14. The student will be able to describe and demonstrate safe electrical practices.
The student will be able to describe and explain types of conductors and circuit loads.
15. The student will be able to understand and demonstrate NM cable.
16. The student will be able to understand and perform a cut on armored cable.
17. The student will be able to identify and demonstrate proper circuit loading.
18. The student will be able to understand and demonstrate proper wire sizing.
19. The student will be able to understand and perform wire twisting connecting.
20. The student will be able to identify and demonstrate safe electrical practices.

The student will be able to describe and explain Switches.
21. The student will be able to understand and demonstrate 15 amp circuitry.
22. The student will be able to understand and perform a 20 amp circuit connection.
23. The student will be able to identify and demonstrate 7.5 amp 220 v connections.
24. The student will be able to understand and demonstrate a knowledge of switch types.
25. The student will be able to understand and perform wiring a three way switch.
26. The student will be able to identify and demonstrate changing a light ballast.
27. The student will be able to describe and demonstrate safe electrical practices.

The student will be able to describe and explain Duplex Outlets.
28. The student will be able to understand and demonstrate three wire polarized.
29. The student will be able to understand and perform three wire grounding.
30. The student will be able to identify and demonstrate four wire grounding.
31. The student will be able to understand and demonstrate the ten step process.
32. The student will be able to understand and perform a continuity check.
33. The student will be able to identify and demonstrate safe electrical practices.

The student will be able to describe and explain Ceiling Boxes and Ceiling Fixtures.
34. The student will be able to understand and demonstrate the types of boxes.
35. The student will be able to understand and perform prepping the boxes.
36. The student will be able to identify and demonstrate mounting a box.
37. The student will be able to understand and demonstrate a knowledge of ceiling fixtures.
38. The student will be able to understand and perform a ceiling fixture install.
39. The student will be able to identify and demonstrate safe electrical practices.

The student will be able to describe and explain Low Voltage Circuits.
40. The student will be able to understand and demonstrate a thermostat.
41. The student will be able to understand and explain a step down transformer.
42. The student will be able to identify and demonstrate ways to reduce voltage.
43. The student will be able to understand and demonstrate a chime check.
44. The student will be able to understand and perform a thermostat install.
45. The student will be able to identify and demonstrate safe electrical practices.

The student will be able to describe and explain Thermostat Controls.
46. The student will be able to understand and demonstrate a primary control.
47. The student will be able to understand and explain thermostat operation.
48. The student will be able to identify and demonstrate a level thermostat mounting.
The student will be able to understand and demonstrate how to calibrate a thermostat.

The student will be able to understand and perform a telephone wire check.

The student will be able to identify and demonstrate a burglar alarm wiring check.

The student will be able to describe and explain environmental sustainability.

The student will be able to describe waste disposal methods for this industry according to EPA and industry guidelines.

The student will be able to describe the process of life cycle analysis in this industry based on industry guidelines.

The student will be able to identify recycled materials by label and industry practice.

The student will be able to explain and define “low emission” and give two examples.

The student will be able to identify new “green” materials now being introduced or currently used in this industry.

The student will be able to describe new “green” practices and methods being instituted or currently employed within this industry.

The student will be able to describe and identify and explain the term “low Impact” as it relates to the environment.

ASSESSMENT OF LEARNER OUTCOMES:
Student progress is evaluated by means that include, but are not limited to, exams written assignments and class participation.

SPECIAL NOTES:
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college’s policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the Director of the Academic Resource Center in Room 3354 or call (913) 288-7670 V/TDD.