COURSE OUTLINE

AREA 224 – RENEWABLE ENERGY ELECTRICAL CODE

Prepared By: Michael J. Newtown, P.E.
Prepared By: Matthew D. Bullwinkel
Updated By: Michael J. Newtown, P.E.
A. **TITLE:** Renewable Energy Electrical Code

B. **COURSE NUMBER:** AREA 224

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE:** No

E. **COURSE LENGTH:** 15 weeks

F. **SEMESTER(S) OFFERED:** Fall/Spring

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**
   3 lecture hours per week

H. **CATALOG DESCRIPTION:** This course deals with the National Electrical Code (NEC) for renewable energy systems. The various aspects of the electrical code are studied to ensure proper system design and installations. Safety issues as related to the various sections of the code are emphasized.

I. **PRE-REQUISITES/CO-REQUISITES:**
   a. Pre-requisite(s): ELEC 261 Electricity or ELEC 171 & ELEC 172 Electrical Construction and Maintenance I & II
   b. Co-requisite(s): none

J. **GOALS (STUDENT LEARNING OUTCOMES):**
   By the end of this course, the student will be able to:
   1. Recall the section of the National Electrical Code as related to specific task conditions.
   2. Demonstrate the proper selection of NEC for compliance.
   3. Produce sketches of components and systems that represent the NEC compliance.
   4. Assemble circuits to NEC requirements.
   5. Evaluate circuits to determine NEC violation.
   6. Propose corrections to NEC violation.

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<th>Course Objective</th>
<th>Institutional SLO</th>
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<td>a. Recall the section of the National Electrical Code as related to specific task conditions.</td>
<td>2. Crit. Thinking 3. Prof. Competence</td>
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<td>b. Demonstrate the proper selection of NEC for compliance.</td>
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<td>c. Produce sketches of components and systems that represent the NEC compliance.</td>
<td>1. Communication 3. Prof. Competence</td>
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<td>d. Assemble circuits to NEC requirements.</td>
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<td>e. Evaluate circuits to determine NEC violation.</td>
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<td>f. Propose corrections to NEC violation.</td>
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K. **TEXTS:**


M. EQUIPMENT: Technology enhanced classroom

N. GRADING METHOD: A-F

O. MEASUREMENT CRITERIA/METHODS:
   • Exams
   • Quizzes
   • Papers
   • Participation

P. DETAILED COURSE OUTLINE:

I. General NEC requirements
   a. Wire size
   b. Wiring integrity
   c. Arc flash hazards
   d. Electrical safety

II. Protection
   a. Service Entrance
   b. Overcurrent protection
   c. Grounding and bonding
   d. DC vs. AC circuits

III. Wiring Methods
   a. Conductor for general wiring
   b. Meter boxes
   c. Pull boxes
   d. Combiner boxes
   e. Metal clad cable
   f. Entrance cable
   g. Rigid Conduit
   h. Flexible metal conduit
   i. PVC conduit
   j. Liquid tight conduit

IV. Equipment for general use
   a. Cords and cables
   b. Switches
   c. Panel and boards
   d. Storage batteries

V. Renewable energy circuits
   a. Circuits requirements
   b. Disconnecting means

Q. LABORATORY OUTLINE: NA