MASTER SYLLABUS

ECMR 104 – Electricity for Trades II Lab

CIP Code: 46.0399

Created by: Michael J. Newtown, P.E.
Updated by:
A. TITLE: Electricity for Trades II Lab

B. COURSE NUMBER: ECMR 104

C. CREDIT HOURS (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity):

# Credit Hours: 4
# Lecture Hours
# Lab Hours 4 - (2) hours per week
Other ___ per Week

Course Length (# of Weeks): 15 weeks

D. WRITING INTENSIVE COURSE: No

E. GER CATEGORY:
Does the course satisfy more than one GER category? If so, which one? No

F. SEMESTER(S) OFFERED: (Fall, Spring, or Fall and Spring) Spring

G. COURSE DESCRIPTION: Continuation of Electricity for Trades I. Includes additional instruction in basic AC system theory, three phase circuits, motors - motor control, transformer theory - connections. Laboratory projects include diagnosis of electrical equipment, motors - motor starters, transformer connections and raceway installations for Commercial Electrical applications.

H. PRE-REQUISITES: Yes - ECMR 103
   CO-REQUISITES: Yes - ECMR 102, Math 101 or Math 106

I. STUDENT LEARNING OUTCOMES: By the end of the course, the student will be able to:

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>PSLO</th>
<th>GER</th>
<th>ISLO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Demonstrate current flow for a given circuit</td>
<td>2. Connect electrical devices in accordance with NEC</td>
<td>5-Ind, Prof, Disc, Know, Skills</td>
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<tr>
<td>b. Demonstrate motor circuit sizing</td>
<td>2. Connect electrical devices in accordance with NEC</td>
<td>5-Ind, Prof, Disc, Know, Skills</td>
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<tr>
<td>ISLO #</td>
<td>ISLO &amp; Subsets</td>
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<tr>
<td>1</td>
<td>Communication Skills&lt;br&gt;Oral [O], Written [W]</td>
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<td>2</td>
<td>Critical Thinking&lt;br&gt;Critical Analysis [CA], Inquiry &amp; Analysis [IA], Problem Solving [PS]</td>
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<td>3</td>
<td>Foundational Skills&lt;br&gt;Information Management [IM], Quantitative Lit./Reasoning [QTR]</td>
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<td>4</td>
<td>Social Responsibility&lt;br&gt;Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</td>
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<td>5</td>
<td>Industry, Professional, Discipline Specific Knowledge and Skills</td>
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**J. APPLIED LEARNING COMPONENT:** Yes__X____ No_______

If Yes, select one or more of the following categories:

Classroom/Lab___X___ Civic Engagement___
Internship___ Creative Works/Senior Project___
Clinical Practicum
Practicum
Service Learning
Community Service

Research
Entrepreneurship
(program, class, project)
K. **TEXTS:**
   Clifton Park: Cengage.

L. **REFERENCES:** National Electric Code Book 2017

M. **EQUIPMENT:** Supplied by college motors, transformers, conduit benders, motor
   starters and electrical conductors.

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**
   - Exams
   - Quizzes
   - Papers
   - Attendance

P. **DETAILED COURSE OUTLINE:**
   N/A

Q. **LABORATORY OUTLINE:** Yes
   1) Drill, Tap and Caliper Measurements
   2) Metal Clad Cable #1
   3) Metal Clad Cable #2
   4) Metal Clad Cable #3
   5) Electric Water Heater
   6) 120 Volt Relay Circuit
   7) Water Tower Control Circuit
   8) Single Phase Transformers Step Up- Step Down
   9) Single Phase Transformer Three Wire Secondary
   10) EMT Raceway cutting, Reaming
   11) EMT Raceway Bending #1
   12) EMT Raceway Bending #2
   13) EMT Raceway Bending #3
   14) Three Phase Transformers Delta to Wye
   15) Three Phase Transformers Wye to Delta
   16) Three Phase Transformers Wye to Wye
   17) Three Phase Transformers Delta to Delta
   18) Three Phase Motor Testing
   19) Three Phase Load Testing
   20) Photo Eye Control 120 Volt Load
   21) Photo Eye Control 208 Volt Load
   22) 120 Volt Holding Circuit
   23) Motor Starter Two Wire Control
   24) Motor Starter Three Wire Control