STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

ECMR 102 – Electricity for Trades II

CIP Code: 46.0399

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Updated by:

Canino School of Engineering Technology
Civil and Construction Technology
Fall 2021

A. TITLE: Electricity for Trades II

B. COURSE NUMBER: ECMR 102

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

 # Credit Hours: 7
 # Lecture Hours _3__ per Week
 # Lab Hours 8 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 101
CO-REQUISITES: Yes - Math 101 or Math 106

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

Course Student Learning Outcome [SLO]	***PSLO***	***GER***	***ISLO***
a. Explain current flow for a given circuit	1. Install wiring systems…		5. **Industry, Professional, Discipline Specific Knowledge and Skills**
b. Design and analyze motor circuit sizing	3. Perform Routine Maintenance on motors and transformers		5. **Industry, Professional, Discipline Specific Knowledge and Skills**

c. Design and analyze transformer circuits	1. Install wiring systems…		5. **Industry, Professional, Discipline Specific Knowledge and Skills**
d. Design and analyze multi-phase circuits	1. Install wiring systems…		5. **Industry, Professional, Discipline Specific Knowledge and Skills**

KEY	**Institutional Student Learning Outcomes [ISLO 1 – 5]**
ISLO #	**ISLO & Subsets**
1	**Communication Skills** Oral [O], Written [W]
2	**Critical Thinking** *Critical Analysis [CA] , Inquiry & Analysis [IA] , Problem Solving [PS]*
3	**Foundational Skills** *Information Management [IM], Quantitative Lit,/Reasoning [QTR]*
4	**Social Responsibility** *Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]*
5	**Industry, Professional, Discipline Specific Knowledge and Skills**

J. APPLIED LEARNING COMPONENT: **Yes__X____ No_____**

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

Classroom/Lab___X
Internship___
Clinical Practicum___
Practicum___
Service Learning___
Community Service___
Civic Engagement___
Creative Works/Senior Project___
Research___
Entrepreneurship___
(program, class, project)

K. TEXTS:
Hermon, Stephen. Delmar's standard Textbook of Electricity 6th Edition.
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:

I. Alternating Current Principles
A. A-C Power
1) Three Phase
2) Single Phase

II. Polyphase Circuits
A. Introduction to Delta Connections
1) How coils are connected in Delta
2) Meaning of the term Delta
B. Current relationships in a Delta Connection
C. KVA Capacity of a Delta Connection
D. Closed Delta Transformer Bank
1) Connection of primary & secondary windings
E. Single Phase Transformers Connected in WYE
1) How coils are connected in wye
2) Meaning of term wye
F. Wye-Wye Connected Transformer Banks
G. Delta-Wye Connected Transformer Banks

III. Transformers
A. Applications of Transformers
B. Construction Of Transformers
C. Elementary Principles of Transformers
D. Polarity
E. Single Phase Connections
F. Transformer Cooling

IV. Single Phase Motors
A. Construction of Split Phase Motor

B. Principles of Operation of Split Phase Motor
C. Principles of Operation of Capacitor Start Motor

V. Three Phase Motors
A. Construction of Motor
B. Principle of Operation
C. Rotor Field
D. Stator Windings
E. Starting Current
F. Reversing Rotation

VI. A-C Motor Controls
A. Starting Squirrel Cage Motors
B. Across the Line Magnetic Motor Starters
C. Motor Reversing

VII. System and Equipment Grounding
A. Grounding Defined
B. Definition of Voltage to Ground
C. Identification of Grounded Conductors
D. Methods of Equipment Grounding

VIII. Conductors and Raceways
A. Conductor insulation
B. Effects of Heat on Conductors
C. Conductor Material
D. Overcurrent Protection
E. Fuses and Circuit Breakers
F. Voltage Drop Calculations
G. Function of Raceways
H. Types of Raceways

VIIII. Lighting
A. Incandescent
B. LED
C. Vapor Lamp
D. Fluorescent Lamp
E. Illumination

IX. Commercial Electrical System
A. Generating Station to Substation
B. Distribution of Power
C. Service Entrance Equipment
D. Feeders and Sub feeders
E. Branch Circuits

Q. LABORATORY OUTLINE: None