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

MASTER SYLLABUS

MECH 261 – MET Electricity

CIP Code: 15.0805
For assistance determining CIP Code, please refer to this webpage
https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55
or reach out to Sarah Todd at todds@canton.edu

Created by: Dr. Lucas Craig
Updated by:

SCHOOL OF ENGINEERING TECHNOLOGY
MECHANICAL ENGINEERING TECHNOLOGY

Fall-2023

A. TITLE: MET Electricity

B. COURSE NUMBER: MECH 261

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

 # Credit Hours: 4
 # Lecture Hours __3_ per Week
 # Lab Hours _2__ Week
Other ___ per Week

Course Length (# of Weeks): 15 Weeks

D. WRITING INTENSIVE COURSE: N/A

E. GER CATEGORY: N/A
Does course satisfy more than one GER category? If so, which one?

F. SEMESTER(S) OFFERED: Fall and Spring

G. COURSE DESCRIPTION:
Fundamentals of alternating current circuits.

H. PRE-REQUISITES: PHYS 122/126 or PHYS 132/136
CO-REQUISITES: Pre-Calculus Algebra (MATH 123)

I. STUDENT LEARNING OUTCOMES:

Course Student Learning Outcome [SLO]	***PSLO***	***GER***	***ISLO***
a. Review DC electrical circuits	1		2. Crit. Thinking 5. Industry, Professional, Discipline-Specific Knowledge and Skills
b. Analyze different types of AC electrical circuits.	1		2. Crit. Thinking 5. Industry, Professional, Discipline-Specific Knowledge and Skills

c. Use electrical measuring instruments properly.	4		2. Crit. Thinking 5. Industry, Professional, Discipline-Specific Knowledge and Skills
d. Understand single-phase and three-phase circuits	1		2. Crit. Thinking 5. Industry, Professional, Discipline-Specific Knowledge and Skills.
e. Discuss electromagnetic induction and its application in motors & generators	1		2. Crit. Thinking 5. Industry, Professional, Discipline-Specific Knowledge and Skills.
f. Discuss the principle operation of transformers, motors, and generators.	1		2. Crit. Thinking 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:

Herman, Stephen. Delmar's Standard Book of Electricity, 5th ed. Clifton Park: Delmar Learning, 2016

L. REFERENCES: N/A

M. EQUIPMENT: Standard electronic laboratory equipment.

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

- Tests
- Quizzes
- Homework assignments
- Lab projects

P. DETAILED COURSE OUTLINE:

1. DC circuit review
    A. Fundamental Units
    B. Ohm's Law
    C. Series/Parallel Circuits
    D. Work, power, energy
2. Magnetism
    A. Permanent Magnets
    B. Electromagnets
    C. Magnetic Circuits
3. Inductance
    A Definition
    B. Units of Measurement
    C. Time Constant
    D. Self Inductance
    E. Lenz's Law
    F. Mutual Inductance
    G. RL circuits
4. Capacitance
    A. Definition &
    B, Units of Measurement &
    C. Time Constant
    D. RC Circuits
5. Single Phase Circuits
    A. Phase Relations
    B. Active and Reactive Powers
    C. Power Factor
    D. RLC Circuits
    E. Resonance Circuits
6. Three Phase Circuits
    A. Wye Connection, Line/Phase Voltages and Currents
    B. Delta Connection, Line/Phase Voltages and Currents

C. Powers and Power Factor
D. Power Sources and Loads

7. Voltage/Current Generation
    A. Theory
    B. Sine Wave and DC Outputs
    C. Peak, Effective, Average Values
    D. AC and DC Generator
8. Transformers
    A. Theory of Operation
    B. Load Operation
    C. Phasing of the Windings
    D. Power Calculations
9. Motors
    A. Theory of Operation
    B. Simple DC Motors
    C. Shunt and Series Motors
    D. Ac Motor Theory
    E. Three Phase Induction Motors
    F. Single Phase Induction Motors

Q. LABORATORY OUTLINE:

1. INTRODUCTION TO THE OSCILLOSCOPE
2. CAPACITIVE DISCHARGE FLASHER and
3. RAMP GENERATOR
4. TRANSFORMER APPLICATIONS
5. RC CIRCUIT CHARACTERISTICS
6. SERIES RESONANCE
7. SINGLE PHASE INDUCTION MOTOR