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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
MECH 128 – Electromechanical Technology

Created by: Dr. Lucas Craig

Updated by:

Canino School of Engineering Technology

Department: MET

Semester/Year: Spring 2019
A. **TITLE**: Electromechanical Technology

B. **COURSE NUMBER**: MECH 128

C. **CREDIT HOURS**: (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)
   
   # Credit Hours: 3
   # Lecture Hours: 2 per week
   # Lab Hours: 2 per week
   Other: per week

   Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE**: Yes ☐ No ☒

E. **GER CATEGORY**: None: ☒ Yes: GER
   
   If course satisfies more than one: GER

F. **SEMESTER(S) OFFERED**: Fall ☐ Spring ☐ Fall & Spring ☒

G. **COURSE DESCRIPTION**:

   This course provides the knowledge base needed to understand the principles, concepts, and applications of electro-mechanics. It presents problem-solving techniques that are critical for troubleshooting situations. Topics covered include: Nature of motion, simple and compound machines, torque, power transmission, motion devices, electric circuits, electromagnetic circuits and devices, and maintenance procedure for electrical and mechanical machines.

H. **PRE-REQUISITES**: None ☒ Yes ☒ If yes, list below:

   MATH 123
   PHYS 121 and PHYS 125

   **CO-REQUISITES**: None ☒ Yes ☐ If yes, list below:
I. **STUDENT LEARNING OUTCOMES:** *(see key below)*

By the end of this course, the student will be able to:

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>Program Student Learning Outcome [PSLO]</th>
<th>GER [If Applicable]</th>
<th>ISLO &amp; SUBSETS</th>
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</thead>
<tbody>
<tr>
<td>Explain the interrelationship of electrical and mechanical machine elements and their underlying principles of operation</td>
<td>2, 6</td>
<td>2-Crit Think ISLO ISLO</td>
<td>PS Subsets Subsets Subsets</td>
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<td>Discuss the use of mechanical coupling, gearing, belt drives, chain drives, bearings, and rigging</td>
<td>2, 6</td>
<td>2-Crit Think ISLO ISLO</td>
<td>PS Subsets Subsets Subsets</td>
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<tr>
<td>Differentiate between electrical, mechanical and pneumatic devices</td>
<td>2, 6</td>
<td>2-Crit Think ISLO ISLO</td>
<td>PS Subsets Subsets Subsets</td>
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<tr>
<td>Develop basic mechanical and electrical skills</td>
<td>6</td>
<td>2-Crit Think ISLO ISLO</td>
<td>PS Subsets Subsets Subsets</td>
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<td>Work and share responsibilities on a team project</td>
<td>5</td>
<td>4-Soc Respons ISLO ISLO</td>
<td>T Subsets Subsets Subsets</td>
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<tr>
<td>Perform basic calculations</td>
<td>6</td>
<td>2-Crit Think ISLO ISLO</td>
<td>PS Subsets Subsets Subsets</td>
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<td>Understand and build controls for electromechanical systems</td>
<td>3, 8, 13</td>
<td>2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO</td>
<td>ISLO ISLO ISLO Subsets Subsets Subsets Subsets</td>
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<td>KEY</td>
<td>Institutional Student Learning Outcomes [ISLO 1 – 5]</td>
<td>ISLO &amp; Subsets</td>
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<td>ISLO #</td>
<td>Communication Skills [O], Written [W]</td>
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<td>1</td>
<td>Critical Thinking</td>
<td>Critical Analysis [CA], Inquiry &amp; Analysis [IA], Problem Solving [PS]</td>
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<td>2</td>
<td>Foundational Skills</td>
<td>Information Management [IM], Quantitative Lit./Reasoning [QTR]</td>
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<td>3</td>
<td>Social Responsibility</td>
<td>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</td>
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<td>4</td>
<td>Industry, Professional, Discipline Specific Knowledge and Skills</td>
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*Include program objectives if applicable. Please consult with Program Coordinator*
J. **APPLIED LEARNING COMPONENT:** Yes ☒ No ☐

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

- Classroom/Lab
- Internship
- Clinical Placement
- Practicum
- Service Learning
- Community Service
- Civic Engagement
- Creative Works/Senior Project
- Research
- Entrepreneurship (program, class, project)

K. **TEXTS:**

N/A

L. **REFERENCES:**

N/A

M. **EQUIPMENT:** None ☒ Needed:

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

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

- Homework 25%
- Exams (3) 30%
- Final Exam / Project 45%

P. **DETAILED COURSE OUTLINE:**

1. Basic Electrical Circuits
   A. Electrical Conductors and Insulators
   B. Resistors and Capacitors
      - C. Current, Voltage, Resistance, and Power
      - D. Series, Parallel, and Series Parallel Circuits
   E. DC Motor Operation
   F. Stepper Motors
   K. Transducers and Sensors

2. Data acquisition (DAQ)
   A. Components for data acquisition
   B. Software for data acquisition

3. Simple machines
   A. Lever
   B. Wheel + axle
   C. Pulley
D. Inclined plane + wedge
E. Screw

4. Gearing, Belt, and Chain Drives
   A. Gear Ratio
   B. Torque Ratio
   C. Efficiency
   D. Gear Trains
   E. The V-Belt and replacement procedure
   F. Synchronous Belt Drives
   G. Timing Belt Pulleys

5. Rotation, Linear, and Intermittent-Motion Devices
   A. Coupling, Universal Joints, Clutches, Moment of Inertia
   B. Rack and Pinion
   C. Cam and Follower
   D. Geneva Drive Mechanism

Q. LABORATORY OUTLINE: None ☐ Yes ☑

I. Arduino Projects: DFRobot Kits, Projects 1 – 15
II. Team Project: Photon
III. Develop and execute a project