

**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:

<u>Course Student Learning Outcome</u> <u>[SLO]</u>	<u>Program Student Learning Outcome</u> <u>[PSLO]</u>	<u>GER</u> <i>[If Applicable]</i>	<u>ISLO & SUBSETS</u>	
Explain the interrelationship of electrical and mechanical machine elements and their underlying principles of operation	2, 6		2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Discuss the use of mechanical coupling, gearing, belt drives, chain drives, bearings, and rigging	2, 6		2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Differentiate between electrical, mechanical and pneumatic devices	2, 6		2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Develop basic mechanical and electrical skills	6		2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Work and share responsibilities on a team project	5		4-Soc Respons ISLO ISLO	T Subsets Subsets Subsets
Perform basic calculations	6		2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets

Understand and build controls for electromechanical systems	3, 8, 13		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	IA Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets

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

*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:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Classroom/Lab | <input type="checkbox"/> Civic Engagement |
| <input type="checkbox"/> Internship | <input type="checkbox"/> Creative Works/Senior Project |
| <input type="checkbox"/> Clinical Placement | <input type="checkbox"/> Research |
| <input type="checkbox"/> Practicum | <input type="checkbox"/> Entrepreneurship |
| <input type="checkbox"/> Service Learning | (program, class, project) |
| <input type="checkbox"/> Community Service | |

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**