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

COURSE OUTLINE

MECH 128– Electromechanical Technology

Prepared By: Stephen E. Frempong
Revised By: Daniel Miller (April 2012)
Updated By: Dr. Lucas Craig (May 2015)
A. **TITLE:** Electromechanical Technology

B. **COURSE NUMBER:** MECH 128

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE:** No

E. **COURSE LENGTH:** 15 weeks

F. **SEMESTER(S) OFFERED:** Spring

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**
   2 Hours of lecture and 2 Hours of lab per week

H. **CATALOG 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.

I. **PRE-REQUISITES/CO-REQUISITES:**
   a. Pre-requisite(s): MATH 123: Pre-Calculus and PHYS 121/125 (Physics I and lab)
   b. Co-requisite(s): None

J. **GOALS (STUDENT LEARNING OUTCOMES):**
   By the end of this course, the student will be able to:

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<tr>
<th>Course Objective</th>
<th>Institutional SLO</th>
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<tr>
<td>1. Explain the interrelationship of electrical and mechanical machine elements and their underlying principles of operation</td>
<td>1. Communication</td>
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<td>2. Discuss the use of mechanical coupling, gearing, belt drives, chain drives, bearings, and rigging</td>
<td>1. Communication</td>
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<td>3. Differentiate between electrical, mechanical and pneumatic devices</td>
<td>2. Critical Thinking</td>
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<td>4. Develop basic mechanical and electrical skills</td>
<td>3. Professional Competence</td>
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<td>5. Work and share responsibilities on a team project</td>
<td>4. Inter-Intrapersonal Skills</td>
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<tr>
<td>6. Perform basic calculations</td>
<td>2. Critical Thinking</td>
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<td>7. Explain the importance of mechanical oscillation and mechanical feedback systems</td>
<td>1. Communication</td>
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K. **TEXTS:** None

L. **REFERENCES:** None

M. **EQUIPMENT:** Electrical and Mechanical laboratories will be used.
N. **GRADING METHOD:** A-F

O. **MEASUREMENT CRITERIA/METHODS:**
   - Exams
   - Quizzes
   - Homework
   - Participation

P. **DETAILED COURSE OUTLINE:**
   1. Basic Electrical Circuits
      - Electrical Conductors and Insulators
      - Resistors and Capacitors
      - Current, Voltage, Resistance, and Power
      - Series, Parallel, and Series Parallel Circuits
      - DC Motor Operation
      - Stepper Motors
      - Transducers and Sensors
   2. Data acquisition (DAQ)
      - Components for data acquisition
      - Software for data acquisition
   3. Simple machines
      - Lever
      - Wheel + axle
      - Pulley
      - Inclined plane + wedge
      - Screw
   4. Gearing, Belt, and Chain Drives
      - Gear Ratio
      - Torque Ratio
      - Efficiency
      - Gear Trains
      - The V-Belt and replacement procedure
      - Synchronous Belt Drives
      - Timing Belt Pulleys
   5. Rotation, Linear, and Intermittent-Motion Devices
      - Coupling, Universal Joints, Clutches, Moment of Inertia
      - Rack and Pinion
      - Cam and Follower
      - Geneva Drive Mechanism

Q. **LABORATORY OUTLINE:**
   I. Lego Mind-Storms
   II. Data acquisition
   III. Testing of sensors (e.g., temperature, pressure, strain gauges, force transducers)
   IV. Simple machines
   V. Gears
   VI. Final Project