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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME

MECH 310 – Instrumentation and Controls For Mechanical Engineers

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:

Canino School of Engineering Technology

Department: MECH

Semester/Year: Fall 2025

A. TITLE: Instrumentation and Controls for Mechanical Engineers

B. COURSE NUMBER: MECH 310

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 will introduce measurement, instrumentation, and control systems. Students explore analog and digital control. Furthermore, process controls will be introduced. Students will do various measurement case studies to control instrumenation and examine corrections on control.

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

MECH 261 or ENGS 263/264 or ELEC 101/109, ENGS 102 or CITA 180, and junior status

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:

Course Student Learning Outcome [SLO]	***Program Student Learning Outcome [PSLO]***	***GER*** *[If Applicable]*	***ISLO & SUBSETS***	
Apply measurements via instrumentation system elements (sensors).	SO 1 and SO 4		2-Crit Think ISLO ISLO	IA Subsets Subsets Subsets

Apply fundamentals of control theory and the types of control systems.	SO 4		2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
Evaluate process controllers.	SO 4		2-Crit Think ISLO ISLO	PS Subsets Subsets Subsets
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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**

*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:

Bolton, William. Instrumentation and Control Systems. ISBN-13: 978-0081006139

L. REFERENCES:

N/A

M. EQUIPMENT: **None** ☐ **Needed:** Lab space with computers

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Quizzes, homework, labs, exams

P. DETAILED COURSE OUTLINE:

Measurement Systems
-Performance Terms
Instrumentation Systems Elements
-Displacement Sensors
-Speed Sensors
-Fluid Pressure Sensors
-Fluid Flow
-Liquid Level
-Temperature Sensors
Analog vs. digital controls
Measurement Case Studies
-Data Acquistion Systems
-Testing
Control Systems
Process Controllers
-On-off

- PID

Q. LABORATORY OUTLINE: **None** ☐ **Yes** ☒

Measurement Systems
-Performance Terms
Instrumentation Systems Elements
-Displacement Sensors
-Speed Sensors
-Fluid Pressure Sensors
-Fluid Flow
-Liquid Level
-Temperature Sensors
Analog vs. digital controls
Measurement Case Studies
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