

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



MASTER SYLLABUS

**COURSE NUMBER – COURSE NAME
MKTX 320 – Mechatronics Laboratory I**

Created by: Rashid Aidun, Ph.D.

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Canino School of Engineering Technology

Department: Mechatronics Engineering Technology

Semester/Year: Fall/2018

A. **TITLE:** Mechatronics Laboratory I

B. **COURSE NUMBER:** MKTX 320

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

Credit Hours: 1

Lecture Hours: per week

Lab Hours: 3 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:**

In this laboratory, the experiments are designed to give students hands on experience with components and measurement equipment used in the design of mechatronic products. Students learn the functions of operational amplifier, diodes/LEDs, Transistors, relays, sensor, and digital components.

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

ENGS 264, MKTX 216

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> <i>[SLO]</i>	<u>Program Student Learning Outcome</u> <i>[PSLO]</i>	<u>GER</u> <i>[If Applicable]</i>	<u>ISLO & SUBSETS</u>	
Function on a multidisciplinary team	d		4-Soc Respons ISLO ISLO	T Subsets Subsets Subsets
Demonstrate the functions of diodes and LEDs in electronic circuits	a, b, k		2-Crit Think ISLO ISLO	CA IA Subsets Subsets
Explain the functions of BJT and MOSFET transistors in electronic circuits.	a, b, k		2-Crit Think ISLO ISLO	CA IA Subsets Subsets
Identify the functions of digital components.	a, b, k		2-Crit Think ISLO ISLO	CA IA Subsets Subsets
Select and use the proper sensors for a particular application.	a, b, c, k		2-Crit Think ISLO ISLO	CA IA Subsets Subsets
Apply techniques appropriate for sensor signal processing	a, b, k		2-Crit Think ISLO ISLO	CA IA Subsets Subsets
Apply conventional techniques for data analysis - statistical or otherwise	a, b, c, e, k		2-Crit Think 3-Found Skills 5-Ind, Prof, Disc, Know Skills	CA IA IM 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

J. **APPLIED LEARNING COMPONENT:** Yes No

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

- | | |
|---|---|
| <input type="checkbox"/> Classroom/Lab | <input type="checkbox"/> Civic Engagement |
| <input type="checkbox"/> Internship | <input checked="" type="checkbox"/> Creative Works/Senior Project |
| <input type="checkbox"/> Clinical Placement | <input checked="" 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:**

Lab Manual created by SUNY Canton Faculty

L. **REFERENCES:**

Laboratory Exercises in Mechatronics, SI Edition, M. Jouaneh, Cengage Learning, ISBN-13: 978-1-133-11159-7

M. **EQUIPMENT:** None Needed: Oscilloscopes, Computers with Data Acquisition capabilities

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

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

- Lab-reports
- Projects
- Participation & Team Work

P. **DETAILED COURSE OUTLINE:**

See lab outline.

Q. **LABORATORY OUTLINE:** None Yes

1. Laboratory Safety and Basic Measurements
2. Basic Electronic Components and their Functions in Electrical Circuits
3. Operational Amplifier
4. Diodes and LEDs
5. BJT and MOSFET Transistors
6. Operational Amplifier (Op-Amp)
7. Relays
8. Digital Circuit Components
9. Sensors
10. Signal Processing and Data Acquisition
11. Data Analysis and Post-Processing

- 12. State Space Model Implementation of System Models**
- 13. Feedback Control**