

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



**MASTER SYLLABUS**

**COURSE NUMBER – COURSE NAME  
MKTX 325 – Microcontrollers**

**Created by: Rashid Aidun, Ph.D.**

**Updated by: J. Miles Canino, Ph.D.**

**Canino School of Engineering Technology**

**Department: Mechatronics Engineering Technology**

**Semester/Year: Fall/2018**

A. **TITLE:** Microcontroller

B. **COURSE NUMBER:** MKTX 325

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

# Credit Hours: 3

# Lecture Hours: 2 per week

# Lab Hours:        per week

Other: 2 hours recitation 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 introduces microcontrollers. The fundamental skills needed to understand, use, and design microcontroller-based systems are explored. The course focuses on 8-bit microcontroller architecture.

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

MKTX 215/216 Digital Fundamentals and Logic Design/Laboratory

**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 &amp; SUBSETS</u>	
Understand the fundamentals of microprocessors and commercially available microcontroller architectures.	a, k		2-Crit Think ISLO ISLO	CA IA Subsets Subsets
Understand the microcontroller programming model and its instruction set.	a, c, k		2-Crit Think ISLO ISLO	CA IA Subsets Subsets
Demonstrate a strong understanding of logic, bit manipulation, and basic arithmetic operations facilitated by microcontrollers	a, c, k		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA Subsets Subsets
Demonstrate familiarity with application programs and the fundamentals of software design	a, c, k		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA Subsets Subsets
Understand the mechanism of system input/output and data conversion	a, k		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA Subsets Subsets

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

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:**

N/A

L. **REFERENCES:**

N/A

M. **EQUIPMENT:** None  Needed:

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

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

- Tests, Quizzes
- Projects
- Homework

P. **DETAILED COURSE OUTLINE:**

- I. **Microprocessor and Microcontroller Fundamentals**
- II. **8-bit Microcontroller Architecture**
- III. **Microcontroller Programming Model and Its Instruction Set**
- IV. **Programming and Problem Solving**
- V. **Introduction to Data Copy (Move), Arithmetic, and Branch Instructions**
- VI. **Introduction to Logic, Bit Manipulation, and Multiply-Divide Operations**
- VII. **Stack and Subroutines**
- VIII. **Application Programs and Software Design**
- IX. **Input and Output (I/O) Ports and Interfacing**
- X. **Interrupts**
- XI. **Timers**
- XII. **Data Converters**
- XIII. **Serial I/O**

Q. **LABORATORY OUTLINE:** None  Yes