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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
MKTX 216/ELEC 166 – Digital Fundamentals & Systems Lab

Created by: Robert Jennings and Rashid Aidun, Ph.D.

Updated by: Dr. Craig

Canino School of Engineering Technology

Department: Mechatronics Engineering Technology

Semester/Year: Spring 2021

A. **TITLE**: Digital Fundamentals and Systems Lab

B. **COURSE NUMBER:** MKTX 216/ELEC 166

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

 # Credit Hours: 1
 # Lecture Hours: **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 laboratory course emphasizes on topics such as: Adder/Subtraction Circuits, Code Converters, Multiplexers and De-Multiplexers, JK Flip-Flop Circuits, Counters, Timers, Memory devices, Analog to Digital and Digital to Analog Converters, and Digital Circuit Troubleshooting.

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

CO-REQUISITES: None ☐ **Yes** ☒ **If yes, list below:**

MKTX 215 or ELEC 165

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***	
Construct and evaluate logic circuits using Tri-State buffers and inverters circuits.	a, b, k		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Design, construct, & evaluate a Digital Electronic Switch circuit.	a, b, c, k		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
Design, Construct, & evaluate a three bit decoder circuit for a seven segment LED (LCD) readout.	a, b, c, k		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Design, Construct, & evaluate a two decade BCD counter circuit using seven-segment LED (LCD) readout	a, b, c, k		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets

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**

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:

Laboratory manual covering the experiments listed below.

L. REFERENCES:

N/A

M. EQUIPMENT: None ☐ Needed: Students are required to purchase laboratory components.

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

- **Tests, Quizzes**
- **Design Projects**
- **Homework**

P. DETAILED COURSE OUTLINE:

See Laboratory Outline

Q. LABORATORY OUTLINE: None ☐ Yes ☒

1. **Number Systems, Operations, and Codes**
2. **Binary Coded Decimal (BCD) code**
3. **Logic Gates**
4. **Boolean Algebra and Logic Simplification**
5. **Combination Logic Analysis**
6. **Functions of Combinational Logic**
7. **Multiplexers and De-multiplexers**
8. **Latches and Flip-Flops**
9. **Counters**
10. **Solid State Memories**
11. **Digital to Analog Converters**
12. **Analog to Digital Converters**