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:

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>Program Student Learning Outcome [PSLO]</th>
<th>GER [If Applicable]</th>
<th>ISLO &amp; SUBSETS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design, construct, &amp; evaluate a Digital Electronic Switch circuit.</td>
<td>a, b, c, k</td>
<td>2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO</td>
<td>CA IA PS Subsets</td>
</tr>
<tr>
<td>Design, Construct, &amp; evaluate a three bit decoder circuit for a seven segment LED (LCD) readout.</td>
<td>a, b, c, k</td>
<td>2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO</td>
<td>CA IA PS Subsets</td>
</tr>
<tr>
<td>Design, Construct, &amp; evaluate a two decade BCD counter circuit using seven-segment LED (LCD) readout.</td>
<td>a, b, c, k</td>
<td>2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO</td>
<td>CA IA PS Subsets</td>
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**KEY**

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