

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



**MASTER SYLLABUS**

**COURSE NUMBER – COURSE NAME  
MKTX 215 – Digital Fundamentals and Logic Design**

**Created by: Robert Jennings and 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:** Digital Fundamentals and Logic Design
- B. **COURSE NUMBER:** MKTX 215
- C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

# Credit Hours: 3  
# Lecture Hours: 3 per week  
# Lab Hours:        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:**

The topics covered in this course are: number systems, logic operations and codes, logic gates, Boolean algebra and logic simplification, combinational logic analysis, functions of combinational logic, latches, flip-flops, counters and shift registers. Digital to Analog and Analog to Digital converters and Semiconductor memories are also covered.

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

CITA 152 Computer Logic and ENGS 102, and PHYS 132/136

**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> <u>[SLO]</u>	<u>Program Student Learning Outcome</u> <u>[PSLO]</u>	<u>GER</u> <i>[If Applicable]</i>	<u>ISLO &amp; SUBSETS</u>	
Perform number systems conversion	a, k		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Provide the simplest expression for the output using Karnaugh mapping with the "Can't Happen" conditions	a, k		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Design and analyze a synchronous Up/Down digital counter	a, c, k		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	CA IA PS Subsets
Describe the internal operations of a successive-approximation type of analog to digital converter	a, k		2-Crit Think 5-Ind, Prof, Disc, Know Skills 1-Comm Skills	CA PS IA W

<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:

- Classroom/Lab
- Internship
- Clinical Placement
- Practicum
- Service Learning
- Community Service

- Civic Engagement
- Creative Works/Senior Project
- Research
- Entrepreneurship  
(program, class, project)

**K. TEXTS:**

Digital Electronics: Principles & Applications, 8th Ed., McGraw-Hill, 2013, ISBN: 9780073373775

**L. REFERENCES:**

N/A

**M. EQUIPMENT: None  Needed:**

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

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

- Tests, Quizzes
- Design Projects
- Homework

**P. DETAILED COURSE OUTLINE:**

1. Number Systems, Operations, and Codes
2. Logic Gates
3. Boolean Algebra and Logic Simplification
4. Combination Logic Analysis
5. Functions of Combinational Logic
6. Latches and Flip-Flops
7. Counters
8. Solid State Memories
9. Digital to Analog Converters
10. Analog to Digital Converters

**Q. LABORATORY OUTLINE: None  Yes**