MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
MKTX 215/ELEC 165 - Digital Fundamentals and Systems

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Updated by: Dr. Lucas Craig

Canino School of Engineering Technology

Department: Mechatronics Engineering Technology

Semester/Year: Spring 2021

A. **TITLE**: Digtal Fundamentals and & Systems

B. **COURSE NUMBER:** MKTX 215/ELEC 165

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:**

ENGS 263 & ENGS 264 or ELEC 101 & Elec 109

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:

Course Student Learning Outcome [SLO]	***Program Student Learning Outcome [PSLO]***	***GER*** *[If Applicable]*	***ISLO & SUBSETS***	
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 syncrhonous 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

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:

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

L. REFERENCES:

N/A

M. EQUIPMENT: None ☒ Needed:

As determined by instructor

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 ☐