University of Toledo
Electrical Engineering Technology
Master Syllabus

Course Title: Digital Logic Fundamentals **Course Code & Number:** EET-2210

Credit Hour Total: 4 **Weekly Contact Hours Lecture**:3 **Lab Hours:** 2

Prerequisite: EET-1010 Resistive Circuits

Text: Digital Fundamentals Conventional Current Version, 11th Ed., Floyd, 2015

Course Coordinator: Kamm

A. Course Description

This course covers the fundamentals of digital logic circuits. Topics include number systems, logic gates, Boolean algebra, logic simplification, Karnaugh maps, adders, multipliers, multiplexers and decoders. Elementary digital circuits including flip-flops, counters, shift registers, memory devices, programmable logic devices and integrated circuits are also covered.

B. Related Program Outcomes:

ABET/Student Outcomes

a. Students will learn fundamental digital electronic skills both in the classroom and laboratory.
b. An ability to select and apply knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.
c. An ability to conduct standard tests and measurements. To conduct, analyze, and interpret experiments. And to apply experimental results to improve processes.
d. An ability to function effectively as a member or leader on a technical team.
e. An ability to identify, analyze, and solve broadly defined engineering technology problems.
f. An ability to apply written, oral, and graphical communication in both technical and nontechnical environments. And an ability to identify and use appropriate technical literature.

g. An understanding of the need for an ability to engage in self-directed continuing professional development.

EET Program Outcomes

a. The application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers, and engineering standards to the building, testing, operation, and maintenance of electrical/electronic(s) systems.
c. The ability to analyze, design, and implement one or more of the following: Control systems, instrumentation systems, communication systems, computer systems, or power systems.

C. Course Objectives:

In this course students are expected to:

1. Develop an understanding of the analytical techniques used in digital logic.
2. Develop an understanding of the laboratory skills used to evaluate digital circuits.
3. Analyze and interpret laboratory data from basic digital logic circuits.
4. Work effectively in the laboratory with lab partners.
5. Identify and solve programs related to digital logic circuits.

D. Course Outline – Major Content Areas

- Use of different number systems, operations, and codes
- Introduction to logic gates
- Familiarization with Boolean Algebra and logic simplification
- Familiarization with Combinational Logic
- Familiarization with functions of combinational logic
- Introduction to flip-flops and related devices
- Introduction to Counters
- Introduction to Counter Design
- Introduction to Shift Registers
- Introduction to memory types and storage
- Integrated circuit technologies

E. Major Laboratory Topics

- Construction of a Logic Probe
- Number systems
- Logic Gates
- Interpreting Manufacturer's Data Sheets
- Boolean Laws and DeMorgan's Theorem
- Logic Circuit simplification
- Adder and Magnitude Comparator
- Combinational logic using multiplexers
- The D latch and D flip-flop
- The J-K flip-flop