Common Course Outline for: ENGR 2302 Digital Logic Design B

A. Course Description

1. Number of credits: 2
2. Lecture hours per week: 3 (half semester course)
   Lab hours per week: 2 (half semester course)
3. Prerequisites: ENGR 2301 Introduction to Digital Systems Design A (C or higher)
4. Co-requisites: None
5. MnTC Goals: None

This is the second half of an introduction to digital logic design. It is recommended for computer and electrical engineering students. Topics include logic simplification, sequential logic, HDL modeling, and analysis and design of synchronous sequential logic circuits, VHDL modeling, and design of digital logic circuits. This course meets for the second half of the semester.

B. Date last revised: April 2017

C. Outline of Major Content Areas: Introduction to and analysis of sequential circuits, sequential circuits modules, sequential circuit design and simplification, HDL representation of sequential circuits, ASM Charts and state machines.

D. Course Learning Outcomes

Upon successful completion of the course, the student will be able to:

1. Analyze and design various sequential, flip-flop-based circuits such as registers, counters, RAM (Random Access Memory), and control circuits.
2. Understand the design ad use of programmable devices such as PLAs, PALs, and FPGAs..
3. Describe logic circuits using hardware description languages (e.g. VHDL).

E. Methods for Assessing Student Learning: Evaluation methods are at the discretion of the instructor and may include exams, quizzes, homework, projects, and labs.

F. Special Information:

Relationship to ABET Accreditation Criteria: To assist our transfer partner engineering programs in their ABET accreditation evaluations, this course teaches skills that help students achieve the following ABET outcomes:

(a) An ability to apply knowledge of mathematics, science, and engineering
(b) An ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political ethical, health and safety, manufacturability, and sustainability
(e) An ability to identify, formulate, and solve engineering problems
(g) An ability to communicate effectively
(i) A recognition of the need for, and an ability to engage in, life-long learning
(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.