Course Number: **EE 200**

Course Title: Digital Logic Circuit Design (Required Course)

Course Description :

Number systems & codes. Logic gates. Boolean algebra. Karnaugh maps. Analysis and synthesis of combinational systems, decoders, multiplexers, adders and subtractors, PLAs. Types of flip-flops. Memoryconcept. Counters. Registers. Introduction to sequential circuit design.

Prerequisites :

Calculus I (MATH 101)
General Physics I (PHYS 101)

Textbook :

M. Morris Mano, *Digital Design* (3rd Edition), 2002,
Prentice Hall, ISBN 0-13-062121-8.

Course objectives :

- Introduce the students to the digital principles with emphasis on logic design.
- Familiarize the students with the necessary mathematical tools such as number systems, codes, and Boolean algebra.
- Learn the principles of analysis and design of combinational logic circuits
- Learn the principles of analysis and design of sequential logic circuits.

Topics Covered :

- Binary Numbers, Number Base Conversions,
- Complements, Signed Binary Numbers, Binary Codes,
- Binary Logic, Boolean Algebra and digital logic gates,
- Forms of logic functions and K-map simplification,
- Analysis and design of combinational logic circuits,
- Adders, Multipliers, Magnitude Comparator, Decoders, Multiplexers,
- Programmable logic devices,
- Flip-flops and sequential circuits,
- Registers and counters.

Class/Laboratory Schedule :

3 lectures per week, 50 minutes each and 3 hours lab per week.

Contribution of course to Meeting the professional component :

The students will learn the principles of digital logic circuits. The course will emphasize the design of logic circuits using tools such as logic works. Laboratory projects are designed to promote and strengthen spirit of multi-disciplinary team. The course design project is intended to build the students' ability to design a system and its components.

Course Outcomes :

After successfully completing the course, the students will be able to

1. Apply knowledge of number systems, codes and Boolean algebra to the analysis and design of digital logic circuits.
2. Identify, formulate, and solve engineering problems in the area of digital logic circuit design.
3. Use the techniques, skills, and modern engineering tools such as logic works and VHDL, necessary for engineering practice.
4. To function on multi-disciplinary teams through digital circuit experiments and projects.
5. To design a digital system, components or process to meet desired needs within realistic constraints.

Course Outcomes to Program Outcome Mapping:

Course Outcome	Program Outcome												
	a	b	c	d	e	f	g	h	i	j	k	l	m
1	X												
2					X								
3											X		
4		X											
5			X										

Prepared by: Professor Mahmoud M. Dawoud, March 7, 2009