NVCC COLLEGE-WIDE COURSE CONTENT SUMMARY

EGR 265 - DIGITAL ELECTRONICS AND LOGIC DESIGN (4 CR.)

COURSE DESCRIPTION

Teaches number representation in digital systems, Boolean algebra, design of digital circuits including gates, flip-flops, counters, registers, architecture, microprocessors, and input-output devices. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

GENERAL COURSE PURPOSE

The course will ground the prospective EE and CSC student in the means of electrical realization of Boolean functions used in computers and other digital devices. It will convey binary number and Boolean algebra principles used in logic design as well as description of the electronic circuits used. A laboratory component will give the student practical experience in assembling digital circuits from basic building blocks, and measuring their logical performance.

ENTRY LEVEL COMPETENCIES

Competence in circuit analysis.

COURSE OBJECTIVES

Upon completion of the course, the student will be provided with the capability to design logical circuits at the Boolean functional level and realize these designs in modern digital electronic integrated circuit building blocks. The student will also be familiar with the architecture and circuitry of microprocessors. The course will give the student laboratory experience in working with these circuits.

MAJOR TOPICS TO BE INCLUDED

- A. Introduction to microelectronics; diodes and transistors
- B. Number systems and conversions
- C. Boolean algebra
- D. Logic simplification using Karnaugh maps and the Quine-McCluskey method
- E. Gates: AND, OR, NAND, NOR, and multilevel gate networks
- F. Combinational network design
- G. Flip-flops, comparators, adders, and subtractors
- H. Counters and shift registers
- I. Sequential networks
- J. MSI integrated circuits in sequential network design
- K. LSI and microprocessors; input-output devices