ELE 435: INTEGRATED CIRCUIT ENGINEERING (elective)

Credit: 3 hours.

Catalog Description: Basic theory of integrated circuits including MOS processing technology. Principles of layout design, simulation and design rule checking of large-scale integrated circuits. Introduction to design tools and techniques including utilization of available design software packages. Course requirements include the design, simulation and layout of an integrated circuit to the point of mask generation.

Prerequisites: ELE 330 and ELE 350.

Textbooks(s) and/or Other Required Materials: Weste, Principles of CMOS VLSI Design, Addison Wesley, 1985.

Topics Covered:

1. Design methodology
2. nMOS and CMOS device modeling and technology
3. Design-fabrication interface
4. Logic design and simulation
5. Systems design
6. VLSI design tools

Class/Laboratory Schedule:
Lecture: 3 hours/week
Lab: none

Course Objectives and Relationship to Program Outcomes:

1. Introduces BJT and MOS transistors as switching elements (Outcome A, B, C, D, I, K).
2. Layout design and design rule check for digital integrated circuits. (Outcome B, C, E, I, K).
3. Addresses the fundamental concepts of Digital Circuits (Outcome A, B, C, D, I, K)
4. Provides methods for the design of logic components. (Outcome B, C, E, I, K)
6. Performs SPICE simulation and implementations at lab sessions. (Outcome A, B, C, E, K).

Coverage (and level) of ABET Outcomes: A (2), B (2), C (3), D (1), E (2), G (1), I (2) and K (2).

Contribution of Course to meeting the Professional Component:
Engineering Topics: 100%

Date: June 2004.