ELE 431: THEORY OF SEMICONDUCTOR DEVICES II (elective)

Credit: 3 hours.

Catalog Description: A continuation of ELE 335 dealing with complex semiconductor devices. The theory of operation of integrated circuits, solid state lasers, switching devices, and negative conductance microwave devices.

Prerequisites: ELE 335.

Textbooks(s) and/or Other Required Materials: Semiconductor Devices, S. M. Sze, John Wiley and Sons, 2nd Ed., 2002. Solid-State Electronic Devices, Streetman, Prentice Hall.

Topics Covered:

1. MESFETs and related Devices
2. Microwave diodes
3. Photonic devices.
4. Fabrication technology of microelectronic integrated circuits.

Class/Laboratory Schedule:

| Lecture:       | 2.5 hours/week |
| Lab:           | none           |

Course Objectives and Relationship to Program Outcomes:

1. To learn the basic theories of modern electronic devices. (Outcome A, E, J, K).
2. To apply semiconductor theories in the design of semiconductor devices and investigating their behavior (Outcome A, C, E, J, K).
3. To use MathCAD and SPICE program to design semiconductor devices and simulate their performance. (Outcome C, E, J, K).
4. To do a project using MathCAD and SPICE program to design different types of devices. (Outcome C, E, J, K).

Coverage (and level) of ABET Outcomes: A (3), C (2), E (3), J (3) and K (3).

Contribution of Course to meeting the Professional Component:

Engineering Topics: 100%

Date: June 2004.