**ELCT 563 - Semiconductor Electronic Devices**

CREDITS/CONTACT HOURS: Credits: 3, Contact Hours: 50

INSTRUCTOR’S NAME: Prof. Asif Khan

TEXT BOOK:
Solid State Electronic Devices by Ben Streetman
ISBN: 9780131497269

Supplemental materials:
Getting to Know Semiconductors by M. E. Levinshstein, G. S. Simin
World Scientific Pub Co.

SPECIFIC COURSE INFORMATION

Prerequisite ELCT 363 or equivalent required

CATALOG DESCRIPTION

Basic semiconductor material properties. Principles and characteristics of semiconductor p-n junction and Schottky diodes, field-effect transistors (JFETs, MESFETs, and MOSFETs), and bipolar junction transistors.

REQUIRED/ELECTIVE:
Elective

LIST OF TOPICS TO BE COVERED

- Semiconductor basics (5 hours)
- Semiconductor pn-junctions (8 hours)
- Photodiodes, LEDs and Tunnel Diodes (8 hours)
- Field Effect Transistors (15 hours)
- Bipolar Junction Transistors (5 hours)

SPECIFIC GOALS FOR THE COURSE

i) The students will gain understanding of semiconductor basics and their properties.
ii) The students will learn principles and characteristics of semiconductor p-n junctions, Schottky barriers and ohmic contacts.
iii) The students will understand the fundamental operation principles of semiconductor devices and solve problems related to their operation.
COURSE OBJECTIVES AND OUTCOMES

1. Demonstrate ability to understand principles underlying semiconductor micro-devices operation. (a, e, j, k)

2. Develop and understanding of how semiconductor micro-electronic devices impact society. (h, j, k)

3. Develop ability to analyze the operation of microelectronic devices using semiconductor properties. (a, e, k)

Relation of course outcomes to program outcomes
H = major importance, M = moderate importance, L = minor importance, blank indicates no relation

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<thead>
<tr>
<th>Program Outcomes</th>
<th>Course Objectives</th>
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<tbody>
<tr>
<td>an ability to apply knowledge of math, science and eng. (a)</td>
<td>1 H</td>
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<tr>
<td>the broad education necessary to understand the impact of engineering solutions (h)</td>
<td>2 H</td>
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<tr>
<td>a knowledge of contemporary issues (j)</td>
<td>3 L</td>
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<tr>
<td>an ability to use the techniques, skills, and modern eng. tool necessary for engineering practice (k)</td>
<td>3 H</td>
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<tr>
<td>An ability to identify, formulate and solve engineering problems (e)</td>
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ASSESSMENT METHODS LIST

- Tests
- Homework
- Class Project
- Midterm and Final Exam