

Semiconductor Devices

EE5311, Fall 2016

University of Texas at El Paso

Instructor: David Zubia, Ph. D. Office Hours: (subject to change)
Office: 335 Engineering T, Th 3:00 to 4:30
Voice: 747-6970 Other hours by appointment
Email: dzubia@utep.edu

Course Description:

This course is composed of two parts: (1) advanced semiconductor fundamentals and (2) modern electronic devices. The first part is designed to give you a good background of semiconductor physics. In the second part, we will use the physics from the first part to study modern semiconductor devices.

(1) Semiconductor fundamental topics that will be covered include: Crystal structure, Basic quantum mechanics, Energy band theory, Equilibrium carrier statistics, Recombination-generation processes and, Carrier transport.

(2) For the second part of the course, modern electronic devices will be studied from both broad and deep perspectives. Modern electronic devices possess dimensions at which the quantum mechanical behavior of matter starts to become manifested. This dimension is approximately 100 nm. These devices are now called nanodevices because of this new behavioral characteristic.

Equally important to detailed study of nanodevices is the study of trends of semiconductor devices. This broad study will give us a perspective as to what direction the technology is heading and also which problems are likely to be encountered in the future.

If time permits, we will also perform a review of the literature in a certain topic and/ device. This exercise will be designed to give you experience in researching a topic on advanced semiconductor devices. A written report will be required of your findings and analysis.

Textbooks:

Physics of Semiconductor Devices, 3rd Ed, Sze and Ng, 2007, Wiley.

Advanced Semiconductor Fundamentals 2nd Ed., Pierret, 2003, Prentice Hall

Evaluation:

	Value
Problems	20%
Exam I	25%
Exam II	25%
<u>Exam III Final</u>	<u>30%</u>
Total	100%

Grading and Policies:

A: 90%-100% B: 80%-<90% C: 70%-<80% D: 60%-<70% F: 0-<60%

Late course work will not be accepted.

No make-up work will be accepted.

Prerequisite: EE 3329 or equivalent.

Academic Dishonesty:

Incidents of academic dishonesty will be referred to the Director of Electrical Engineering and the Dean of Students.

<http://studentaffairs.utep.edu/Default.aspx?alias=studentaffairs.utep.edu/dos>

The descriptions and definitions of academic dishonesty can be found at:

<http://admin.utep.edu/hoop> Look under Student Affairs and then Chapter one, section 1.3.1.

If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass.