Modern Semiconductor Devices

EE5313, Fall 2014

University of Texas at El Paso

Instructor:	David Zubia, Ph. D.	Office Hours: (subject to change)
Office:	A335 Engr Annex	T,Th 3:00-4:30
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Course Description:

This course is composed of three parts: (1) semiconductor fundamentals, (2) device building blocks, and (3) modern electronic devices. The first part will be a review of the following topics: Crystal Structure, Energy Bands and Energy Gap, Carrier Concentration at Thermal Equilibrium and, Carrier-Transport Phenomena. The first part is designed to give you a good background of semiconductor physics which will be used in parts (2) and (3).

In the second part we will study important Device Building Blocks. Topics that we will cover include: p-n Junctions, Metal-Semiconductor Contacts, and Metal-Insulator-Semiconductor Capacitors. Parts (1) and (2) will give you a solid foundation to study and understand advanced modern devices.

Finally, in part (3) we will study modern semiconductor devices - primarily transistors. We will study Bipolar Transistors and MOSFETs. If time permits will we also study other advanced devices including; MODFETs, Resonant Tunneling Diodes, Transferred-Electron Devices, and Real-Space-Transfer Devices.

Learning Objectives:

After completion of this course, students should be able to:

- Students shall be able to apply semiconductor properties to the understanding of electronic devices
- Students shall be able to demonstrate understanding of device building blocks
- Students shall be able to demonstrate understanding of modern semiconductor devices

Textbooks:

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

Evaluation:

	Value
Homework	25%
Exam I	25%
Exam II	25%
Exam III Final	25%
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 5311 or equivalent or permission from Instructor

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.