EE 3310/CE 3310 Course Syllabus

Course Information

Electronic Devices (3 semester credit hours)
Spring 2017
FN 2.106
Tuesday and Thursday
1:00 pm – 2:15 pm

Professor Contact Information

James J. Coleman
Office: ECN 3.504
Lab: ROW 1.160D
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Telephone: 972-883-4381
Office Hours: By arrangement (email)

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Prerequisite: CE 3301 or EE 3301
Co-requisite: CE 3110 or EE 3110

Course Description

Theory and application of solid state electronic devices. Physical principles of carrier motion in semiconductors leading to operating principles and circuit models for semiconductor devices. Introduction to integrated circuits.

Student Learning Objectives/Outcomes

1. Ability to estimate bulk semiconductor properties (electron and hole densities, Fermi energy, conductivity, etc.) from basic data using energy band diagrams and basic formulae.
2. Ability to estimate "excess" electron and hole: densities, recombination rates, generation rates, motion and induced currents in semiconductors.
3. Ability to calculate the properties of PN-junction diodes and Metal-Semiconductor junctions under equilibrium, dc and ac biased conditions from basic data using energy band diagrams and basic (physically derived) formulae.
4. Ability to analyze biased and unbiased operation of field effect transistors and bipolar junction transistors.
5. Ability to read and understand literature related to electronic devices.

Textbooks and Materials

Solid State Electronic Devices by Ben G. Streetman and Sanjay K. Banerjee

Professional Courtesy

Be on time for class and do not leave early
Turn your cell phones off and put them away
Do not record audio, video, or still photographs during class

Course Topical Outline

1. Course Introduction
2. Solids and Crystals
3. Energy Bands and Carriers
4. Excess Carriers
5. Junctions
6. Field Effect Transistors
7. Bipolar Transistors
8. Two-terminal and Photonic Devices

Grading Policy

20% Assigned homework and in-class quizzes
80% Exams (4 exams at 20% each)
Exam Dates: TBA

Course & Instructor Policies

Make-up exams: You must have written permission from Prof. Coleman to take an exam at an alternate time and you must have that permission at least 1 hour in advance of the regularly scheduled exam time
Late Work: Homework is due at the beginning of class on the due date. Each student must turn in individual work. All assigned work will be collected. Late HW will be reduced in credit by 20% per day late.
Extra Credit: None.
Special Assignments: None
Class Attendance: Highly Recommended. Each student is expected to add to discussion.

Off-campus Instruction and Course Activities

None

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same: “As a Comet, I pledge honesty, integrity, and service in all that I do.”

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus. Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.