Catalog

Conduction theory of solids.

Description

Tunnel, backward, breakdown, multilayer and varactor diodes
Silicon controlled rectifier and switches
Unijunction transistors
Hot electron devices
Lasers and laser applications

Instructor

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Schedule

Class : Mondays and Wednesdays, 4:00 – 5:15 p.m., Room SSW-2660
Final Examination : Monday, May 12, 2000, 3:30 p.m. – 5:30 p.m.
Midterm : TBD (around the second week of March); during the class hour
Holidays: Monday, March 31 (Cesar Chavez Day); March 31 – April 4 (Spring Break)

Pre-requisites

(1) Required: Undergraduate electronic materials and devices (EE 434)
(2) Helpful: Undergraduate microelectronics (EE 330-430)

Textbook

(Prentice Hall, Upper Saddle River, N.J., 2006)

Work Load

1. Readings: From textbook; handouts, outside resources
2. Practice Problems: assigned problems, with a problem set per topic
3. Midterm and final examination

Grading

Letter grades, based on the composite performance on each of the following factors
Homework 20%
Midterm 30%
Final Exam 50%

For Graduate Students,
Project Report 20%
Midterm 30%
Final Exam 50%

Policies

1. On Exams: There are no makeup exams. Midterm and final exam are open-book.
2. On Homework: A problem set assigned on each topic; collected, graded, and returned.
3. On Report: Topic must be selected by early February, and approved by the instructor.

Course Goals

The course objectives include both general objectives (such as learning to learn on your own, reading the current literature in professional literature, and approaching a problem as an engineering professional), as well as several subject matter specific objectives, including the following:
(a) Understanding electrical conduction in semiconductors
(b) Description of charge carriers in terms of energy band diagrams
(c) Transport and recombination of excess carriers in semiconductors
(d) Semiconductor junctions under equilibrium and non-equilibrium
(e) Operation of majority carrier (field-effect) transistors
(f) Operation of minority carrier (bipolar junction) transistors
(g) Detection and generation of photons in semiconductor devices
(h) Integrated circuit technology and large-scale integration
Course Outline
1. Crystal Properties and Growth of Semiconductors
2. Atoms and Electrons
3. Energy Bands and Charge Carriers in Semiconductors
4. Excess Carriers in Semiconductors
5. Semiconductor Junctions
6. Field Effect Transistors
7. Bipolar Junction Transistors
8. Optoelectronic Devices
9. Integrated Circuits
10. High-Frequency and High-Power Devices

SYLLABUS STATEMENTS

Spring Schedule Adjustment Deadline
There is a single schedule adjustment deadline for the Spring 2014 semester for any of the following changes: Drop classes, Add classes, Change grading basis, and Withdraw from the university. This deadline for Spring 2014 semester is February 4 at 11:59 p.m. Students are responsible for initiating action for their own schedule adjustments. Faculty have the option to drop you from their course for non-attendance or lack of required prerequisites. The spring 2014 faculty drop deadline is January 31 at 11:59 p.m.

For Students with Disabilities
If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that no accommodations can be provided based upon disability until an accommodation letter from Student Disability Services has been received.

University Policy Towards Cheating and Plagiarism
In preparing and submitting materials for academic courses and in taking examinations, a student shall not yield to cheating or plagiarism, which violate academic standards and make the offender liable to penalties described in Section 41301 of Title 5, California Code of Regulations; following procedures consonant with due process established pursuant to Section 41304, any student of a campus may be expelled, suspended, placed on probation, or given a lesser sanction for one or more of the following causes that must be campus related. Cheating is defined as the act of obtaining or attempting to obtain credit for academic work by the use of dishonest, deceptive, or fraudulent means. Plagiarism is defined as the act of incorporating ideas, words, or specific substance of another, whether purchased, borrowed, or otherwise obtained, and submitting same to the university as one's own work to fulfill academic requirements without giving credit to the appropriate source. (See "University Policies" section of the SDSU General Catalog).