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Grading Policy: Grades will be distributed as follows;

- Two in-term exams
  - First Exam Thursday 12:30 pm 23/4/1431 (8/4/2010) 20%
  - Second Exam Thursday 12:30 pm 20/6/1431 (3/6/2010) 20%
- Class/Home work 10%
- Drop Quizzes 10%
- Final Exam (covers the entire course content) 40%

Total Grade 100%

A student will not be given a make-up exam unless he presents an official excuse.

Attendance:
A student with an absence of 25% or greater by the last day of classes will not be allowed to attend the final exam. Tutorials will be included in the absence rate.

Course Content:

- Introduction
  - Semiconductors: how different from metals and insulators
  - Intrinsic, N-type, and P-type Semiconductors
  - Generation, Recombination, and Energy band model
  - Conductivity and resistivity
  - Current mechanisms: diffusion and drift currents

- P-N Junction Diodes
  - Physical Operation of Diodes
  - Terminal (I-V) characteristics of Junction Diodes
  - The Ideal Diode and Constant-Voltage Models
  - Diode Applications: Logic gates, Rectifiers, Photodiodes, Solar Cells, LEDs, Zener, and Laser Diodes.
  - Analysis of Diode Circuits
  - The Small-Signal Model and its Application
EE311 - Basics of Semiconductor Devices

- **Metal-Oxide Semiconductor Field-Effect Transistors (MOSFETs)**
  - Introduction: MOSFET and the Digital World
  - The Enhancement-Type MOSFET (E-MOSFET): Device Structure and Physical Operation
  - Current-Voltage Characteristics for E-MOSFET
  - The Depletion-Type MOSFET (D-MOSFET): Device Structure and Physical Operation
  - Current-Voltage Characteristics for D-MOSFET
  - MOSFET Circuits at DC
  - The MOSFET as an Amplifier and as a Switch
  - Small-Signal Operation and Models
  - The NMOS and CMOS Digital Logic Inverters

- **Bipolar Junction Transistors**
  - Physical Structures Modes of Operation, and Types
  - Graphical Representation of Transistor Characteristics
  - Analysis of Transistor Circuits at DC
  - The Transistor as an Amplifier
  - Small-Signal Equivalent Circuit Models
  - Graphical Analysis
  - The Transistor as a Switch

- **Four Layers (three junctions) Devices: Thyristors**
  - Structure
  - I-V characteristics