

Global Learning Initiatives Program Course Syllabus

Course Information

Course Name	Semiconductor Devices and Physics
Lecturer(s)	Kuan-Neng Chen
Course Description	<ol style="list-style-type: none">1. Fundamentals2. Metal-Semiconductor Junction3. p-n Junction4. Metal-Oxide-Semiconductor Structure5. MOS Field-Effect Transistor6. Bipolar Junction Transistor
Course Objectives	Emphasis on physical understanding of device operation through energy band diagrams and short-channel MOSFET device design.
Suggested Proficiencies (if any)	Knowledge of basic Electronics
Reading List (if any)	Textbook: D. A. Neamen, Semiconductor Physics and Devices, Mc-Graw References: S. M. Sze, Semiconductor Devices: Physics and Technology, Wiley
Grading Criteria	Quiz 1: 25% Quiz 2: 25 % Final Exam: 25% Homework + Class interaction: 25%

Course Schedule

Week	Date (YYYY/MM/DD)	Course Topic	Lecturer
1	2020/3/4	Course overview; Semiconductor Development; Crystal Structure and Electrical Conduction	Kuan-Neng Chen
2	2020/3/11	Crystal Structure and Electrical Conduction; Electron Statistics and Intrinsic Semiconductor	Kuan-Neng Chen
3	2020/3/18	Extrinsic Semiconductors; Carrier Transport Phenomena	Kuan-Neng Chen
4	2020/3/25	Carrier Transport Phenomena	Kuan-Neng Chen
5	2020/4/1	Carrier Generation and Recombination; Mid-Term Exam	Kuan-Neng Chen
6	2020/4/8	Carrier Generation and Recombination	Kuan-Neng Chen
7	2020/4/15	Carrier Generation and Recombination; Carrier Flow	Kuan-Neng Chen
8	2020/4/22	Metal-Semiconductor Junction	Kuan-Neng Chen
9	2020/4/29	Metal-Semiconductor Junction	Kuan-Neng Chen
10	2020/5/6	p-n Junction	Kuan-Neng Chen
11	2020/5/13	p-n Junction; Mid-Term Exam	Kuan-Neng Chen
12	2020/5/27	The Si surface and the Metal-Oxide-Semiconductor Structure	Kuan-Neng Chen
13	2020/6/3	Metal-Oxide-Semiconductor Structure	Kuan-Neng Chen
14	2020/6/10	Metal-Oxide-Semiconductor Field-Effect Transistor	Kuan-Neng Chen
15	2020/6/17	Metal-Oxide-Semiconductor Field-Effect Transistor; Bipolar Junction Transistor	Kuan-Neng Chen
16		Final Exam	Kuan-Neng Chen