

固態電子元件

Solid State Electronic Devices

Sept. 2014

COURSE DESCRIPTION

In this course, lessons consisting of semiconductor physics and devices by lectures and assigned projects, which developing students' professional semiconductor knowledge acquired in the basic physics and electronics classes. Students learn to know the energy band, semiconductor conduction theory, and junction characteristics. They also learn to analyze basic behavior and operation of diode, MOSFET, and BJT devices. Extended VLSI integration technology is also addressed and introduced. Device design and scalability consideration will be taught in class and assigned in homework.

EE3350 固態電子元件導論

Introduction to Solid-State Electronic Devices

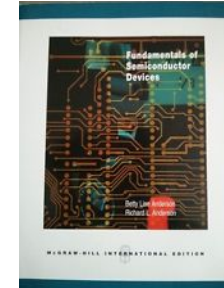
■ Class Time & Room

- W3W4F4 ;台達215

■ Textbook

- [Fundamentals of Semiconductor Devices](#)

by Betty L. Anderson & Richard L. Anderson (Mc GRAW.HILL)



■ References

- [Semiconductor Physics and Devices](#)
by Donald A. Neamen (Mc GRAW.HILL)

- [Solid State Electronic Devices](#)

by Ben G. Streetman & Sanjay K. Banerjee (Pearson)

■ ftp for handout/material download

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Contact Information

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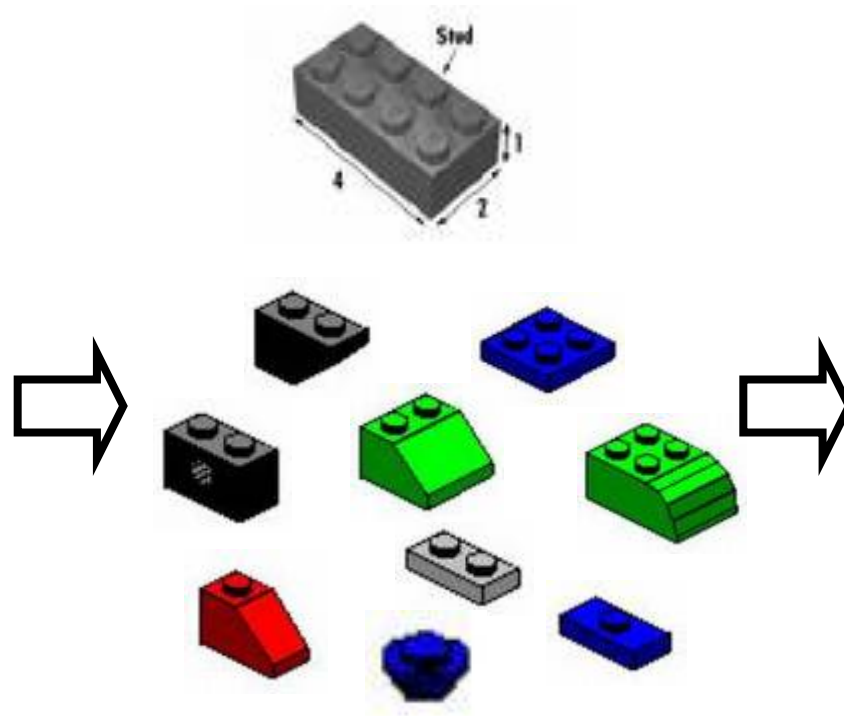
- TA: 鄭清芳, 楊智淞
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What's Device ?

Manufacturing



Components

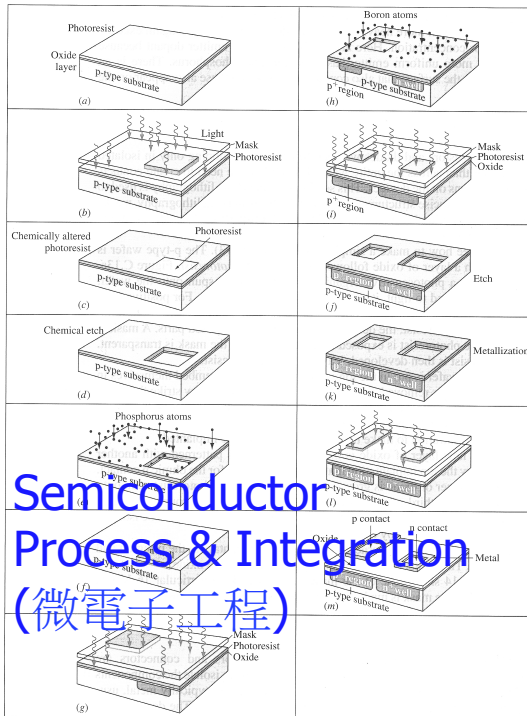


Composition



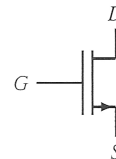
What's Device ?

Manufacturing



Semiconductor
Process & Integration
(微電子工程)

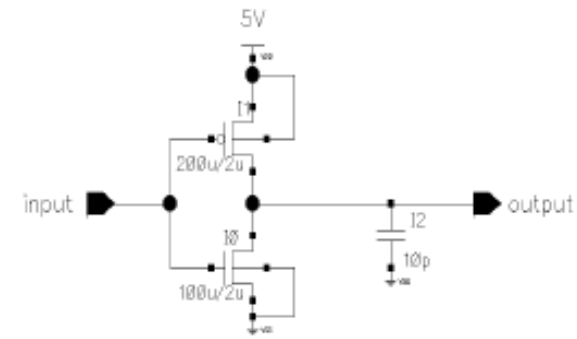
Components



Semiconductor
Devices
(固態電子元件)

VLSI Device
(積體電路元件)

Composition



Microelectronics
(電子學)

VLSI Circuit Design
(積體電路設計)

Syllabuses

- Semiconductor Material & Energy States
- Semiconductor Diodes
- Semiconductor MOS Capacitor
- Field Effect Transistors
- Bipolar Junction Transistors

Chapters and Schedule

	Topic	Section	Week
A	Semiconductor Physics and Model	Energy State and Model	1,2
B		Energy Bands & Levels	3
C		Current Flow Model	4
D	Junction / Diode / HetroJunction	Homogeneous Junction	5,6
E		Small Signal & Transient Efeect	7
F		Nonstep & Hetero Junctions	8
G	MOSC / MOSFET / Advanced CMOS	MOS Capacitor	9, 10
H		Charge Control Model	11
I		MOSFET Characteristics 1	12
J		MOSFET Characteristics 2	13
K	Bipolar Transistor	Bipolar Structure	14
L		Physical Effect and Mechanism	15

Grading Policy

- GRADING:
 - Quiz (n) 30%
 - Midterm (1) 30%
 - Final (1) 40%