

## Course Name: 製程整合 Process Integration

授課教授：張守仁教授

### 1. 課程簡述 Brief Course Description

This course provides the basic introduction of process integration in semiconductor IC manufacturing, and the topics include Logic technology scaling, enablement of new technology nodes, process variation and design co-optimization, process flow in FEOL, MEoL, BEoL, and 3D package, and yield/reliability. Might cover the emerging technology topic also.

### 2. 此科目對應之系所課程規畫所欲培養之核心能力(Core capability to be cultivated by this course) :

Build up the knowledge in the Logic technology development and yield improvement from integration point of view.

### 3. 課程內容關鍵字(Key Words) :

Process integration, Logic Technology, CMOS, Process Flow, Yield, and System Integration

### 課程大綱 Detailed Course Syllabus

- 課程說明(Course Description):

See Syllabus

- 指定用書(Text Books):

None

- 參考書籍(References):

- “Semiconductor Integrated Circuit Processing Technology”, Revised version, by W. R. Runyan and K. E. Bean (ISBN-10 0201108313)
- “Semiconductor physics and devices basic principles”, Donald A. Neamen (ISBN-10 0073529583)
- “Microchip Fabrication: A Practical Guide to Semiconductor Processing”, Sixth Edition, by Van Zant, Peter (ISBN 10: 0071821015)
- “Semiconductor Microchips and Fabrication : A Practical Guide to Theory and Manufacturing”, by Lian, Yaguang (ISBN 10: 1119867789)
- “半導體製程技術導讀”, Hong Xiao, 全華圖書

- 教學方式(Teaching Method):

Lecture

● 教學進度(Syllabus): (Might be adjusted)

週次	授課內容
1	Semiconductor Material & Device Overview (I)
2	Semiconductor Material & Device Overview (II)
3	Logic Technology Roadmap and Scaling
4	Platform Enablement – from design to chips
5	Process variability and Design –T echnology Co-optimization
6	FEOl-MEOl Integration (I)
7	FEOl-MEOl Integration (II)
8	BEoL Integration (Power Rail & TSV)
9	Yield, Metrology, Reliability and PFA/EFA (I)
10	Yield, Metrology, Reliability and PFA/EFA (II)
11	<b>Mid-term Exam &amp; Mid-term Homework Delivery</b>
12	FinFET Technology brief introduction (I)
13	FinFET Technology brief introduction (II)
14	Stacking and Monolithic Technology (I)
15	Stacking and Monolithic Technology (II)
16	Emerging Technology
17	<b>Final Report (Oral)</b>
18	<b>Final Exam</b>

● 成績考核(Evaluation):

Mid-term Exam	20%
Mid-term Homework	30%
Final Report (Oral Presentation)	30%
Final Exam	20%