Syllabus [2025Year 1 Term]

Course Information

Course Title	Semiconductor Processing and Chemical Engineering	Credits	3
Course Code	346800-1	Required/Elective (For Undergraduate Courses)	Selective majors
Department or Major	Department of Chemical Engineering	Language	English
Methods of Teaching		Lecture Room	월9,10,11,12,13,14(3공319)
Time Allotment	Lecture(3) Experiments(0) Trainging & Practice(0) Performance(0) Designing & Planning(0)	Cyber Lectures	
Course Type	offline		

Lecturer

Lecturer	Name	Soohwan Jang	Rank	Professor	Final Academic Degree	공학박사
	Department & college	Semiconductor Specialized Workforce Training Project Group		Office	College of Engineering - Building 3 510	
	Office Phone Number	031-8005-3623		e-mail	jangmountain@dankook.ac.kr	
	Field of Interest					

Course Summary

Course Description	Introduce nano-electronic processing and basic electronic as well as optical devices to the non-electrical engineering students. The course will cover materials growth, photolithography, vacuum, vacuum gage, pump, etching, metal and dielectric deposition, device concept and device characterization.
Description Related Courses	Genral chemistry, Physical chemistry, Organic chemistry
Course Goals	1. Understanding of basic semiconductor physics. 2. Understanding of semiconductor fabrication processes. 3. Interpretation of operation principle of semiconductor device.
Projected Results	1. Application of math, basic science, and engineering knowledge. 2. Design of systems, elements, and processed considering limiting conditions.

	3. Formulating and solving of engineering problems.
Percentage of the original language classes(%)	

Syllabus

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
1	Introduction	Understanding of course goals		
2	Optical lithography	Understanding of Optical lithography		
3	Optical lithography	Understanding of Mask aligner		
4	Photoresists	Understanding of Positive / negative PR		
5	Vacuum science	Understanding of Vacuum pump		
6	Plasmas	Understanding of plasma principle and generation		
7	Etching	Understanding of Wet etching		
8	Etching	Understanding of Dry etching		
9	Mid. Exam.	Evaluation of course achivement		
10	Metalization	Understanding of evaporator and sputter		
11	Chemical vapordeposition	Understanding of CVD		
12	Diffusion	Understanding of Furnace and diffusion model		
13	Device theory	Understanding of Diode & FET devices		
14	Ion implantation and RTA	Understanding of ion implantation and following thermal treatment		
15	Final Exam.	Evaluation of course achivement		

Methods of Grading

sequence	Description	Percentage	Details
1	Mid-tem Exam	40%	
2	Final-exam	40%	
3	Pop Quizzes	0%	
4	Assignments	0%	
5	Reports	0%	
6	Presentations & Discussions	0%	
7	Attendance	10%	
8		0%	
9	Others	10%	
All		100%	

Core of Value

핵심가치	전공역량	역량정의	역량구분	값(%)
혁신 (Discovery)	창의적문제해결 (Creative problem-solving)	주어진 상황과 문제를 창의적으로 해결할 수 있는 능력	부역량	30%
혁신 (Discovery)	도전 (Challenging)	전공 지식을 새로운 분야와 융합하고 아우를 수 있는 능력		0%
혁신 (Discovery)	지식융합 (Knowledge convergence)	새로운 분야를 개척하거나 도전적으로 임할 수 있는 능력	주역량	50%
헌신 (Dedication)	세계시민 (Universal value)	세계 공동체 구성원으로 전공자로서 국제적 이슈에 대응할 수 있는 능력		0%
헌신 (Dedication)	상호협력 (Cooperation)	공동의 목적 달성을 위해 타인과 상호협력을 할 수 있는 능력	부역량	20%
헌신 (Dedication)	공동체 (Sense of community)	공동체의 구성원으로서 필요한 태도와 윤리의식을 가질 수 있는 능력		0%
능동 (self- Determination)	자기주도 (Self-Managing)	주어진 상황과 문제를 주도적이고 능동적으로 해결할 수 있는 능력		0%
능동 (self- Determination)	지식활용 (Knowledge application)	주어진 상황과 문제에 대해 논리적으로 파악하고 분석할 수 있는 능력		0%

핵심가치	전공역량	역량정의	역량구분	값(%)
능동 (self- Determination)	논리적사고 (Logical thinking)	전공관련 지식을 필요에 따라 다양하게 적용하고 활용할 수 있는 능력		0%
능동 (self- Determination)	의사소통 (Articulation)	대화를 통해 다양한 의견을 조율하고 합의를 이끌어 낼 수 있는 능력		0%

Textbook(s) & References

Description	Title	Author	Publisher
References	fabrication engineering at the micro and nanoscale	STEPHEN A. CAMPBELL	Oxford University press

Memo

1. The lecture will be conducted based on the lecture notes.

2. Students are expected to do their best on each exam and are strictly prohibited from any form of cheating.

3. Three instances of tardiness will be considered as one absence.