112-2 Full Curriculum of Da-Yeh University

Information			
Title	Introduction to Electronic Materials	Serial No./ID	0540 /EEI2022
Required/Credit	Optinal /3	Time/Place	(Mon)234 /H339
Language	Chinese	Grade Type	Number
Lecturer /Full- or Part-time	Jung-Jie Huang /Full-time	Graduate Class	Non-graduating Class
School System /Dept /Class, Grade	Bachelor /Department of Electrical Engineering /Class 1, Grade 2		
Office Hour / Place	(Tue) 13:20~14:10, (Tue) 14:20~15:10 / H323		
Lecturer	n.a.		

Introduction

TBA

Outline

TBA

Prerequisite

None

The Relationship Between Courses and Departmental Core Competencies and Basic Skills

Being able to collect and analyze data, to perform simulation, to design experiments and to solve problems.

- Being able to exchange electrical engineering information in English.
- To have the ability to yield insight into the development trend of engineering related industries in Taiwan and around the world.

To have professional ethics and to pay attention to the impact of engineering technology on the social environment and to fulfill engineers ’ social responsibility.

To know basic electrical engineering English.

- With electrical engineering expertise and application capability.
- Owning ability of understanding basic knowledge and application of mathematics and physics.
- Understand the fundamentals of information technology and know how to apply it.

Teaching Plan						
Core Capability	Weight(%)【A】	Ability index(Performance Indicators)	Teaching Methods	Assessment and Weight	Core Competency Learning Outcomes【B】	Final Exam Grades【C=B*A】
Owning ability of understanding basic knowledge and application of mathematics and physics.	20	Handing in homeworks on time. Passing the necessary tests Active learning and questioning.	Lecturing	Final Exam: 20% Midterm Exam: 20% Homework Assignment: 20% Course Participation: 20% Experiment Operation: 20%	Total: 100	20
Understand the fundamentals of information technology and know how to apply it.	20	Handing in programming homeworks on time. Passing the necessary tests. Active learning and questioning.	Lecturing	Midterm Exam: 20% Final Exam: 20% Homework Assignment: 20% Course Participation: 20% Experiment Operation: 20%	Total: 100	20
With electrical engineering expertise and application capability.	30	Handing in homeworks on time. Active learning and questioning. Passing the necessary tests.	Lecturing	Final Exam: 20% Midterm Exam: 20% Homework Assignment: 20% Experiment Operation: 20% Course Participation: 20%	Total: 100	30
Being able to exchange electrical engineering information in English.	20	Being willing to discuss with others. Being familiar with using of software, apparatus, and machines, etc. Being able to resolve professional issues.	Lecturing Practical Operation (Experiment, Machine Operation	Midterm Exam: 20% Final Exam: 20% Homework Assignment: 20% Course Participation: 20% Experiment Operation: 20%	Total: 100	20

To have the ability to yield insight into the development trend of engineering related industries in Taiwan and around the world.	10	Being able to present the newest development of technology of electrical engineering and trends. Being able to write a report on related industry developments or patents.	Lecturing	Midterm Exam: 20% Final Exam: 20% Course Participation: 20% Homework Assignment: 20% Experiment Operation: 20%	Total: 100	10

Grade Auditing

Homework Assignment: 20%
Midterm Exam: 20%
Course Participation: 20%
Experiment Operation: 20%
Final Exam: 20%

Book Type (Respect intellectual property rights. Please use official textbooks and do not illegally photocopy others' works.)

Book Type	Book name	Author
Textbook	半導體製程概論	李克駿、李克慧、李明逵

Lesson Plan

Weeks	Content	Teaching Methods
1	Introduction to Electronic Materials & Intellectual Property Protection (use legitimate textbooks only) & Traffic safety Propaganda	Lecturing
2	1.Crystal structure and physical properties of silicon semiconductors 2.Semiconductor energy band and carrier transport	Lecturing
3	Compound semiconductor crystal structure and physical properties	Lecturing
4	Semiconductor basic components - Junction Energy Band Diagram and Fermi Level	Lecturing

5	1.Integrated circuit manufacturing process and layout 2.Downsizing of semiconductor devices and advanced nano devices	Lecturing
6	High speed and high power components	Lecturing
7	Semiconductor Optoelectronics	Lecturing
8	Growth of silicon ingot, Silicon wafer production	Lecturing
9	Mid-term Exam	Exam
10	Compound semiconductor ingot growth, Silicon epitaxial growth	Lecturing
11	Silicon epitaxy system, Compound semiconductor epitaxial growth	Lecturing
12	Silicon oxide film growth, Silicon oxide film growth mechanism	Lecturing
13	Dopant diffusion implantation, Doped ion implantation	Lecturing、 Practical Operation (Experiment, Machine Operation
14	Lithography, Etching technology	Lecturing
15	Chemical vapor deposition, Metal contact and deposition	Lecturing
16	Integrated circuit package	Lecturing
17	Reliability and functional testing, Material characteristics testing	Lecturing、 Practical Operation (Experiment, Machine Operation
18	Final Exam	Exam