Semiconductor Engineering 2

Basic Course Information			
Course Number	01005099	Subject Category	Compulsory (M)
Class Format	Lecture	Credit Type and Number of Credits	1
Department	Mechatronics	Student Category	Year 5
Period of Study	Semester 2	Classes per Week	1
Required Materials	TBA		
Instructor	Hitoshi Nishizawa	Jirapat Anuntahirunrat	

Course Objective

The course provides students with introduction and basic knowledge of physics in Semiconductors and Semiconductor devices including FETs and MOSFETs.

Evaluation(Rubric)	Ideal Level of Achievement (Very Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fail)
Physics of field effect transistors	Able to describe how field effect transistors work in detail.	Able to describe how field effect transistors work.	Cannot describe how field effect transistors work.
Physics of CMOS devices	Able to describe how CMOS devices work in detail.	Able to describe how CMOS devices work.	Cannot describe how CMOS devices work.
Production process of semiconductor devices	Able to explain how semiconductor devices are produced in detail.	Able to explain how semiconductor devices are produced.	Cannot explain how semiconductor devices are produced.

Relationship with Learning Outcomes
M(2) Ability to design, propose and develop electrical and electronic systems for robotics/ mechatronic systems
Please change
Please change

Teaching Method	
Outline:	Lecture and group work
Class Format:	Lecture and group work
Please Note :	Students are required to ask any questions after sufficient self-learning

Course Plan

Semester 2	Contents and Method of Course	Goals	Related MOC
1st Week	Transistors for switching, switching circuits, and logic circuits	Can explain how transistors are used in switching circuits.	
2nd Week	Field effect transistors and MOS diodes	Can explain how field effect works in semiconductors	V-C 4 62
3rd Week	MOSFET, CMOS	Can explain how MOS devices work	V-C 4 62
4th Week	Integrated circuits (Ics) and their applications	Can explain how ICs and LSIs are constructed and used in electrical and electronic circuits	
5th Week	Power transistors	Can explain how semiconductor devices are used in power control	
6th Week	National Holiday *		
7th Week	Development and design of LSI	Can explain how LSIs are developed and designed	
8th Week	Preparing for Mid-term examination *	Review problems for the mid term examination.	
9th Week	National Holiday *		
10th Week	Mid-term examination	Can slove problems at the mid-term examination.	
11th Week	Return exam papers and feedback * Production technology of silicon wafers	Review and summarize the learning, can explain the outline of production technology of silicon wafers.	
12th Week	LSI production process (1) chips	Can explain the outline of LSI chips' production process.	
13th Week	LSI production process (2) packages	Can explain the outline of LSI packages' production process.	
14th Week	Heterojunction semiconductor devices	Can explain how heterojunction semiconductor devices work.	
15th Week	Optical and thermo-electrical properties of semiconductor devices	Can explain the optical and thermo-electrical properties of semiconductor devices.	V-C 3 61
16th Week	Electromagnetic, and quantum effect properties of semiconductor devices	Can explain the electromagnetic and quantum effect properties of semiconductor devices.	V-C 3 61
17th Week	National Holiday *		
18th Week	Preparing for final examination	Review related circuit problems for the final examination.	
19th Week	Final Examination *	Can slove problems at the final examination.	
20th Week	Return exam papers and feedback	Review and summarize the learning.	

Do not

	Examination	Quiz	Mutual Evaluations between students	Report	Portfolio	Other
Basic Ability	60	40				
Technical Ability						
Interdisciplinary Ability						