Introduction of Electrical engineering

Basic Course Information

Course Number	03005071	**Subject Category**	Compulsory (E)
Class Format	Lecture	**Credit Type and Number of Credits**	1
Department	Mechatronics	**Student Category**	Year 1
Period of Study	Semester 1	**Classes per Week**	1
Required Materials			
Instructor	Kenji Kashine	Sompod Wongkhead	

Course Objective

The course provides students with an introduction of electrical engineering: its history and present development. Daily use electrical devices to large scale electrical facilities are selected to explain what is electrical Engineering and its future.
Through this course, students can be achieved five main objectives as follows.
(1) To be able to explain the historical background of electrical engineering, and be interested in related technologies.
(2) To be able to explain the fundamental laws of electric circuit and apply them to the simple circuits.
(3) To be able to explain the basic theory of electromagnetism and apply them to the operating principle of electro machineries.
(4) To be able to explain the basic theory of semiconductor and their application devices.
(5) To be able to explain the basic theory of electro-communication and their application.

Evaluation (Rubric)	Ideal Level of Achievement (Very Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fail)
Explain the basics of electrical engineering	To be able to explain the historical background of electrical engineering in detail, and be interested in related technologies.	To be able to explain the historical background of electrical engineering, and be interested in related technologies.	Cannot be interested in electrical engineering and related technologies.
Basic knowledge of electric circuits	To be able to explain the fundamental laws of electric circuit in detail and apply them to the simple circuits.	To be able to explain the fundamental laws of electric circuit and apply them to the simple circuits.	Cannot explain the fundamental laws of electric circuit and apply them to the simple circuits.
Basic knowledge of electromagnetism	To be able to explain the basic theory of electromagnetism in detail and apply them to the operating principle of electro machineries.	To be able to explain the basic theory of electromagnetism and apply them to the operating principle of electro machineries.	Cannot explain the basic theory of electromagnetism and apply them to the operating principle of electro machineries.
Basic knowledge of semiconductor	To be able to explain in detail the basic theory of semiconductor and their application devices.	To be able to explain the basic theory of semiconductor and their application devices.	Cannot explain the basic theory of semiconductor and their application devices.
Basic knowledge of electro-communication	To be able to explain in detail the basic theory of electro-communication and their application.	To be able to explain the basic theory of electro-communication and their application.	Cannot explain the basic theory of electro-communication and their application.

Relationship with Learning Outcomes

E(1) Ability to design, propose and develop electrical and electronic systems to solve specific problems.

E(2) Ability to design, propose and develop smart electrical power systems for sustainable development.

Please change

Teaching Method

Outline:	The course provides students with an introduction of electrical engineering. Students study the fundamental knowledge of electric and electronics engineering. The topic covered in this course: History and present development of electrical engineering, Fundamental theory of electric circuit, electromagnetism, semiconductor and electro-communication.
Class Format:	Lecture and Exercises
Please Note :	All materials will be posted on the Google classroom

Course Plan

Semester 1	Contents and Method of Course	Goals	Related MOC
1st week	Guidance, History of electricity	To be able to explain the importance of Electrical and Electronics technology in our life and future.	
2nd week	Basic elements of electricity 1	To be able to explain the importance of Coulomb's law and the interaction between particles.	V-C 2 26
3rd week	Basic elements of electricity 2	To be able to explain the characteristics of electrical elements such as current, voltage, and resistance.	V-C 1 1
4th week	Ohm's Law	To be able to explain the importance of Ohm's Law and apply it into the simple electric circuit.	V-C 1 2
5th week	Fundamental law for calculating the electrical circuits 1	To be able to explain the details of Kirchhoff's Current Law and apply it into the parallel circuits.	V-C 1 3
6th week	Fundamental law for calculating the electrical circuits 2	To be able to explain the details of Kirchhoff's Voltage Law and apply it into the series circuits.	V-C 1 3
7th week	Electric power and energy	To be able to explain power and energy in detail and calculate with simple circuits	V-C 1 6
8th week	Midterm Exam	For week 1-7	
9th week	Midterm Examination(Feedback)	Explaining Return Exam Papers and Feedback	
10th week	Overview of electromagnetism	To be able to explain the outline of magnetism and electromagnetism.	V-C 2 28
11th week	Fleming's Law and its applications	To be able to explain Fleming's Law in detail and apply it into the electro machinery.	V-C 2 36 V-C 2 40
12th week	Holiday		
13th week	Overview of sinusoidal waveform	To be able to explain the details about sinusoidal voltage and current, frequency, and phase.	V-C 1 7
14th week	Overview of semiconductor	To be able to explain the outline of the atomic structure of semiconductors and schematics of PN junction diode.	V-C 4 54
15th week	Semiconductor application device	To be able to explain the functions of semiconductor application devices such as LED, photo diode, Transistor and so on.	V-C 4 58
16th week	Communication	To be able to explain the outline of Electro-communication.	V-C 2 31
17th week	Electronic components	To be able to explain the function and structure of electric components such as capacitor and inductor.	
18th week	Review	Explaining Review before Final Examination	
19th week	Final Exam	For week 10-18	
20th week	Return Exam Papers and Feedback, and special sessions	Review and summarize learning	

Do not

	Examination	Quiz	Mutual Evaluations between students	Report	Portfolio	Other
Basic Ability	70	30				
Technical Ability						
Interdisciplinary Ability						