Oyama College		Year	2022		Course Title	電気機器概論

Course Information

Course Code	0109		Course Category	Specialized / Compulsory
Class Format	Lecture		Credits	Academic Credit: 2
Department	Department of Innovative Electrical and Electronic Engineering		Student Grade	4th
Term	Second Semester		Classes per Week	2
Textbook and/or Teaching Materials	Tadashi FUKAO, "Introduction to electrical machines", Jikkyo Shuppan (in Japanese)			
Instructor	SUZUKI Shin-nosuke			

Course Objectives

1. Explaining the relationship between the global environment and electrical energy conversion technology.
2. Explaining the principle, basic characteristics, etc. of DC machines.
3. Explaining the principle and basic characteristics of transformers.
4. Explaining the principle, basic characteristics, etc. of induction machines.
5. Explaining the principle, basic characteristics, etc. of synchronous machines.
6. Explaining the principle, basic characteristics, etc. of semiconductor power converters.

Rubric

	Ideal Level	Standard Level	Unacceptable Level
Achievement 1	Explaining the relationship between the global environment and electrical energy conversion technology and solving the exercises related to them accurately.	Explaining the relationship between the global environment and electrical energy conversion technology and solving the exercises related to them .	Unable to explain the relationship between the global environment and electrical energy conversion technology and solve the exercises related to them .
Achievement 2	Explaining the principle, basic characteristics, etc. of DC machines and solving the exercises related to them accurately.	Explaining the principle, basic characteristics, etc. of DC machines and solving the exercises related to them.	Unable to explain the principle, basic characteristics, etc. of DC machines and solve the exercises related to thesm.
Achievement 3	Explaining the principle, basic characteristics, etc. of transformers and solving the exercises related to them accurately.	Explaining the principle, basic characteristics, etc. of transformers and solving the exercises related to them.	Unable to explain the principle, basic characteristics, etc. of transformers and solve the exercises related to them accurately.
Achievement 4	Explaining the principle, basic characteristics, etc. of induction machines and solving the exercises related to them accurately.	Explaining the principle, basic characteristics, etc. of induction machines and solving the exercises related to them.	Unable to explain the principle, basic characteristics, etc. of induction machines and solve the exercises related to them accurately.
Achievement 5	Explaining the principle, basic characteristics, etc. of synchronous machines and solving the exercises related to them accurately.	Explaining the principle, basic characteristics, etc. of synchronous machines and solving the exercises related to them.	Unable to explain the principle, basic characteristics, etc. of synchronous machines and solve the exercises related to thesm.
Achievement 6	Explaining the principle, basic characteristics, etc. of semiconductor power converters and solving the exercises related to them accurately.	Explaining the principle, basic characteristics, etc. of semiconductor power converters and solving the exercises related to them.	Unable to explain the principle, basic characteristics, etc. of semiconductor power converters and solve the exercises related to them accurately.

Assigned Department Objectives

学習・教育到達度目標 ④
JABEE (A) JABEE (d-1) JABEE (g)

Teaching Method

Outline	In this lecture, you will learn about DC machines, transformers, inducers, synchronous machines, and semiconductor power converters. At the same time, you will also learn about the relationship between electrical equipment and the global environment and power generation technology. Llectures will give you n using slide materials, handouts, and exercises according to the textbook.
Style	1. The lesson method is mainly lectures. You may be asked to solve exercises during classes. 2. Exercises may be given as assignments and answers may be requested. 3. In addition to assignments, quizzes may be conducted.
Notice	Students who need to re-examine after the final exam will be contacted by the instructor when returning the exam. From the viewpoint of learning achievement, students who do not seem to have achieved some of the evaluation items may not pass.

Characteristics of Class / Division in Learning

☑ Active Learning	☑ Aided by ICT	☑ Applicable to Remote Class	☐ Instructor Professionally Experienced

Course Plan

			Theme		Goals

2nd Semester	3rd Quarter	1st	Global environment and electrical energy: From generation to utilization. Relationship of electrical equipment Pre-learning: Read the preface of the textbook and check what you don't understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to understand and explain the global environment and electrical energy. conversion technology
		2nd	DC generator Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to DC generators .
		3rd	Ratings for DC motors and DC machines Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to ratings for DC motors and DC machines.
		4th	Electrical material Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to Eeectrical material.
		5th	Transformer structure, theory Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to Ratings for transformer structure, theory.
		6th	Transformer equivalent circuit Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to transformer equivalent circuit.
		7th	Transformer characteristics, wiring Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to transformer characteristics, wiring.
		8th	Various transformers Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to various transformers.
	4th Quarter	9th	Principle, structure, theory of three-phase induction motor Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to principle, structure, theory of three-phase induction motor.
		10th	Equivalent circuit, characteristics, operation of three-phase induction motor Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to equivalent circuit, characteristics, operation of three-phase induction motor.
		11th	Various induction machines Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to various induction machines.
		12th	Three-phase synchronous generator, motor Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to three-phase synchronous generator, motor.

		13th	Utilization of small motors and electric motors, power electronics Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to utilization of small motors and electric motors, power electronics.
		14th	Electrical equipment and power generation method Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	To be able to solve exercises related to electrical equipment and power generation method.
		15th	Summary of electrical equipment engineering Pre-learning: Read the textbook page instructed at the end of the previous lesson and check what you do not understand. Post-learning: Summarize the lesson content in writing and follow the instructions at the end of this lesson.	Comprehensive understanding of electrical equipment engineering.
		16th	Term exam	Understand the scope so far.

Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	70	0	0	0	0	30	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	0	30	100
Cross Area Proficiency	0	0	0	0	0	0	0