Akashi College	Year	2023	Course Title	Electric Circuits Ⅱ A

Course Information

Course Code	5226	Course Category	Specialized / Compulsory
Class Format	Lecture	Credits	Academic Credit: 2
Department	Electrical and Computer Engineering	Student Grade	2nd
Term	First Semester	Classes per Week	2
Textbook and/or Teaching Materials			
Instructor	KAJIMURA Yoshihiro		

Course Objectives

Evaluation point 1: Understand and can explain the relationship between voltage and current in resistance, coils, and capacitor elements, and can use it in the calculation of an electrical circuit.
Evaluation point 2: Understand and can explain the instantaneous values, phaser, and complex number expressions, and can use them in the calculation of a sine wave AC circuit.
Evaluation point 3: Can explain the principle and method of measuring effective power, reactive power, and power factor, and calculate them.
Evaluation point 4: Can explain how mutual inductance circuits work, and calculate circuit voltages, currents, etc.
Evaluation point 5: Can explain and calculate voltages and currents (phase voltage, line voltage, line current) in three-phase AC.

Rubric

	Ideal Level	Standard Level	Unacceptable Level
Achievement 1	Understand the relationship between voltage and current in resistance, coils, and capacitor elements, and can use it in the applied calculation of an electrical circuit.	Understand the relationship between voltage and current in resistance, coils, and capacitor elements, and can use it in the calculation of an electrical circuit.	Do not understand the relationship between voltage and current in resistance, coils, and capacitor elements, and cannot use it in the calculation of an electrical circuit.
Achievement 2	Understand and can explain the instantaneous values, phaser, and complex number expressions, and can use them in the applied calculation of a sine wave AC circuit.	Understand and can explain the instantaneous values, phaser, and complex number expressions, and can use them in the calculation of a sine wave AC circuit.	Do not understand and cannot explain the instantaneous values, phaser, and complex number expressions, and cannot use them in the calculation of a sine wave AC circuit.
Achievement 3	Can explain the principle and method of measuring effective power, reactive power, and power factor, and solve problems.	Can explain the principle and method of measuring effective power, reactive power, and power factor.	Cannot explain the principle and method of measuring effective power, reactive power, and power factor.
	Can perform applied calculations of voltages, currents, etc. in mutual inductance circuits, etc.	Can calculate voltages, currents, etc. in mutual inductance circuits, etc.	Cannot calculate voltages, currents, etc. in mutual inductance circuits, etc.
	Can perform applied calculations of voltages and currents (phase voltage, line voltage, line current) in three-phase AC.	Can calculate voltages and currents (phase voltage, line voltage, line current) in three-phase AC.	Cannot calculate voltages and currents (phase voltage, line voltage, line current) in three-phase AC.

Assigned Department Objectives

Teaching Method

Outline	The goals of this course are to be able to explain the meaning and application of physical quantities such as voltage, current, and impedance in the AC circuit theory, which is the basis of electrical and electronic engineering, and be able to calculate them. The class also involves practice problem exercises, etc. to help students learn them.
Style	Explanations will be given in line with the textbook. The class will be carried out using slides and worksheets. There will regularly be report assignments of problem exercises.
Notice	This course's content will amount to 180 hours of study in total. These hours include learning time guaranteed in classes and the standard self-study time required for pre-study / review, and completing assignment reports. The overall evaluation will be based 80% on periodic exams, and 20% on report assignments including worksheets done during class. The reports will be mostly made up of the questions at the end of each chapter. The minimum score for a pass will be 60%. Students who miss 1/3 or more of classes will not be eligible for a passing grade.

Characteristics of Class / Division in Learning

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

Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Electrical mathematics exercise I	Can calculate derivative and complex numbers.
		2nd	Electrical mathematics exercise II	Can calculate integrals.
		3rd	Sine wave AC, mean values	Understand sine wave AC and calculate mean values.
		4th	RMS values	Can calculate RMS values.
		5th	Resistive circuits	Can find the current in a resistive circuit.
		6th	Inductance circuit	Can find the current in a inductance circuit.
		7th	Capacitor circuits	Can find the current in a capacitor circuit.

		8th	Midterm exam	
	2nd Quarter	9th	R-L circuits	Can find the current in a R-L circuit.
		10th	R-C circuits	Can find the current in a R-C circuit.
		11th	The basics of R-L-C circuit vector notation	Can find the current in a R-L-C circuit.
		12th	The basis of the vector notation I	Understand the meaning of the vector notation and express AC voltage with symbols.
		13th	Basics of the vector notation II	Can calculate an AC circuit using the vector notation.
		14th	Impedance and admittance I	Can calculate impedance and admittance.
		15th	Impedance and admittance II	Can calculate impedance and admittance of a complex circuit.
		16th	Final exam	

Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Report	Portfolio	Other	Total
Subtotal	80	0	0	20	0	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	80	0	0	20	0	0	100
Cross Area Proficiency	0	0	0	0	0	0	0