Oyama College	Year	2024	Course Title	Complex Analysis

Course Information

Course Code	0008	Course Category	Specialized / Elective
Class Format	Lecture	Credits	Academic Credit: 2
Department	Advanced Course of General Engineering	Student Grade	Adv. 1st
Term	First Semester	Classes per Week	2
Textbook and/or Teaching Materials	「Ouyosugaku (2nd Edition)」, 「Ouyosugaku Mondaisu (2nd Edition)」, MORIKITA PUBLISHING , in Japanese.		
Instructor	NAKAGAWA Hidenori,OKAZAKI Masao,OKADA So		

Course Objectives

1. Understand the concepts of complex numbers, polar forms, holomorphic functions and conformal transformations, and be able to solve exercise about them.
2. Understand the concepts of Cauchy's integral theorem, Laurent series and residues, and be able to answer questions relating to them.

Rubric

	Ideal Level	Standard Level	Unacceptable Level
Achievement 1	Be able to clearly explain the concepts of complex numbers, polar forms, holomorphic functions and conformal transformations, and be able to accurately solve practice problems related to this.	Be able to solve practice problems related to complex numbers, polar forms, holomorphic functions and conformal transformations.	Unable to solve practice problems related to complex numbers, polar forms, holomorphic functions and conformal transformations.
Achievement 2	Be able to clearly explain the concepts of Cauchy's integral theorem, Laurent series and residues, and be able to accurately solve practice problems related to this.	Be able to solve practice problems related to Cauchy's integral theorem, Laurent series and residues.	Unable to solve practice problems related to Cauchy's integral theorem, Laurent series and residues.

Assigned Department Objectives

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Teaching Method

Outline	This course deals with holomorphic functions, extending the differentiation and integration on real numbers to complex numbers.
Style	This is an omnibus class. The class will consist mainly of lectures, with assignments and quizzes as appropriate. The first eight lessons are worth 50 points (handled by Okazaki), and the 9th to 15th lessons are worth 50 points (handled by Nakagawa), for a total of 100 points.
Notice	Self-study is recommended.

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	Complex Numbers (Okazaki)	To be able to solve relevant questions.
		2nd	Polar Forms, Definition of Complex Functions (Okazaki)	To be able to solve relevant questions.
		3rd	Basic Complex Functions (Okazaki)	To be able to solve relevant questions.
		4th	Limits and Continuity of Complex Functions (Okazaki)	To be able to solve relevant questions.
		5th	Differentiability of Complex Functions, Holomorphic Functions (Okazaki)	To be able to solve relevant questions.
		6th	Cauchy–Riemann Equations (Okazaki)	To be able to solve relevant questions.
		7th	Holomorphic Functions and Their Derivatives (Okazaki)	To be able to solve relevant questions.
		8th	Integration of Complex Functions (Okazaki)	To be able to solve relevant questions.
	2nd Quarter	9th	Cauchy's Integral Theorem (Nakagawa)	To be able to solve relevant questions.
		10th	Cauchy's Integral Formula (Nakagawa)	To be able to solve relevant questions.
		11th	Taylor Series (Nakagawa)	To be able to solve relevant questions.
		12th	Laurent Series (Nakagawa)	To be able to solve relevant questions.
		13th	Residue (Nakagawa)	To be able to solve relevant questions.
		14th	Residue Theorem (Nakagawa)	To be able to solve relevant questions.
		15th	Final Examination (Nakagawa)	
		16th		

Evaluation Method and Weight (%)

	Examination	Assignments, quizzes etc.	Total
Subtotal	90	10	100
Basic Proficiency	0	0	0

Specialized Proficiency	90	10	100
Cross Area Proficiency	0	0	0