科目ナンバリング	U-LAS10 20010 LE55						
授業科目名<英訳>	Function Theory of a Complex Variable-E2 Function Theory of a Complex Variable-E2			担当者所属職名・氏名	京都大学　　未定		
群	自然科学科目群		分野(分類)	数学(発展)		使用言語	英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	講義（対面授業科目）
開講年度・開講期	2025・後期	曜時限		配当学年	主として2回生	対象学生	理系向

[授業の概要・目的]

Based upon knowledge of calculus, this is an introductory course to the function theory of one complex variable (i.e. introduction of complex analysis), and its goal is to understand fundamentals about holomorphic functions and meromorphic ones, which are dealt through the Cauchy's integral formula. The purpose of this course is not only to understand rigorous theories but to obtain some skills about the residue calculus. The theory for complex functions are not only beautiful in a mathematical sense but also very useful in applied fields e.g. physics, engineering and medical sciences etc. Almost all the mathematical theories in this course are rigorously dealt with, and some examples related with physics are also explained. An additional goal of this course is to give a chance to the students to present and discuss mathematics in English.

[到達目標]

The goal is to understand fundamentals about holomorphic functions and meromorphic ones, which are dealt through the Cauchy's integral formula. In addition to learning modern mathematics and proofs, students can also learn how to discuss and present mathematical topics in English through this course.

[授業計画と内容]

The course will cover the following topics, and each of them is read in 2 or 3 weeks:
1. complex numbers, the complex number plane and the Riemann sphere
2. differential of complex functions; holomorphic functions and the Cauchy- Riemann equation etc.
3. power series and analytic functions
4. integral; the Stieltjes integral and Cauchy's integral formula
5. fundamental theories for holomorphic functions
6. singularities and residue; the Laurent expansion and the residue calculus.

Total：14 classes, 1 Feedback session

[履修要件]

(Eligible students) mainly the sciences of the second grade

Students are required good understanding of both calculus and linear algebra.

[成績評価の方法・観点]

The evaluation of the course will take into account the following criteria:
-homework (40%)
-presentation (20%)
-final report (40%)

Function Theory of a Complex Variable-E2(2)へ続く↓↓↓

Function Theory of a Complex Variable-E2(2)

[教科書]

Not Specified

[参考書等]

（参考書）

Donald Sarason 『Complex Function Theory』（AMS: American Mathematical Society）
Elias Stein, Rami Shakarachi 『Complex Analysis』（Princeton University Press）
磯 祐介 『複素関数論入門』（サイエンス社）ISBN:978-4-7819-1326-1

[授業外学修（予習・復習）等]

The students are requested to solve exercises given in class by themselves even though they are not assigned as homework.

[その他（オフィスアワー等）]

This class is an English class for the classes of 「**関数論**」, and their syllabuses are the same to one another.

Office hours are not assigned and it is advisable to make comments willingly during and after the class.

[主要授業科目（学部・学科名）]

理学部