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**Lecture**

TR 12:00–1:15pm

**Room**Keller 313

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**Instructor:** Pierre-Olivier Parisé (email: [parisepo@hawaii.edu](mailto:parisepo@hawaii.edu))

Office: Physical Science Building (PSB) 302

Office hours: By showing up.

## COURSE DESCRIPTION

One of the first breakthrough that uses complex numbers is the solution to the cubic equation. Roots of  $-1$  were used explicitly in the cubic formula. Nowadays, complex numbers are being used throughout science to simplify calculations or even to represent certain aspects of our universe.

In this class, we will go beyond the complex numbers. We will explore one of the most fruitful branch of mathematics: Complex Analysis. Here are the (possible) topics we will cover in this class:

- Power series and analytic functions.
- The Maximum Principle and its consequences.
- Integration of analytic functions and its applications.
- Cauchy's Theorem and its consequences.
- Elementary Maps such as the linear fractional transformations, the exponential, the logarithm, the power maps, the trigonometric functions and the root functions.
- Connections between harmonic Functions and analytic function.
- Conformal Maps, Normal Families and the Riemann Mapping Theorem.
- Calculus of residues.

## COURSE MATERIAL

**Textbook:** Donald Marshall., *Complex Analysis* (2019). Not mandatory.**Course website:** <https://mathopo.ca/courses-website/math-644/math-644>. All the information about the course (like the schedule, lecture notes, homework solutions) is posted on the course website.**Laulima:** The Laulima course website will also be used. This is where the homework assignments and your grades will be posted. The course website will also be embeded in the Laulima course website.

## IMPORTANT DATES

Here are important dates to remember:

- Spring recess: March 13-17.
- Study day: May 4.
- Take-home final: May 9.
- Final project: May 9.

## GRADING COMPONENTS

Your course average will be determined by a weighted average of the components below.

- (1) **Final (40%):** There will be a take-home final on Tuesday, May 9.
- (2) **Homework (60%):** There will be homework each week assigned on each Tuesday. The homework problems will be posted on Laulima, in Assignments. There will be due for the next Tuesday. You should handout a physical copy of the your solutions to the problems at the beginning of Tuesday's lecture.
- (3) **Project (40%):** There will be a paper to write by the end of the semester. The complete list of subjects will be posted on the course website one month after the beginning of the semester. The project is due on Tuesday, May 9.

The total does not equal 100%. This is because the best grade between the final and the project will be considered in the calculation of the final average score.

## LECTURES

If you miss a lecture or recital, you are responsible for any assignments and/or announcements made. Unavoidable absences should be explained to the instructor.

**Turn off** your cellphone. Cellphones are a

## BIG DISTRACTION

for listening and interacting with me and your fellow students. Tablets are allowed only to take notes. No worries, you'll survive and we'll have fun!

## MISSED ASSIGNMENT POLICIES

**Policies for homework:** No late homework will be accepted. The mark zero(0) will be attributed to a late homework.

**Academic integrity:** All students are expected to abide by the university's Conduct Code. Academic sanctions for dishonesty may include receiving an F in the assignment or receiving an F in the class. There may be additional administrative sanctions, see <https://www.hawaii.edu/policy/index.php?action=home&policySection=ep>

**Academic Expectations:** You should be familiar with the academic expectations for UH Math courses outlined here:

<http://www.math.hawaii.edu/~dale/Expectations.html>.

## CONCERNS

If at any time during the semester you have any questions or concerns about the class, please contact me during regularly scheduled office hours or via email to make an appointment. You may also contact the following people:

### Graduate Chair

Asaf Hadari

[hadari@math.hawaii.edu](mailto:hadari@math.hawaii.edu)