

Course Information

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1 Introduction

Welcome To HSSP!

An important fact of algebra states that each polynomial can always be split into linear factors over the complex numbers. For examples, $x^2 - 5x + 6 = (x - 2)(x - 3)$, and $x^2 - 4x + 5 = (x - 2 - i)(x - 2 + i)$. But Euler made a bold claim: that $\sin(x)$ can be factored in the same way. What exactly does he mean? How could this claim possibly be true? The answer lies in a field of mathematics called "Complex Analysis". In this class we will take a short walk through this exciting and beautiful land and visit some of the most amazing tricks of mathematics.

[Important]: Classes take place every Sunday from **12:00-13:00, July 7th to August 18th**, at Room **1-242**(Floor 2 of Building 1).

2 Goals

The main goal of the class is to understand and use:

- Cauchy's Integral Formula
- Hadamard's Product Formula

See the Syllabus for more detailed descriptions.

3 Prerequisites

The class is based on tools from Calculus, including infinite sums and the Taylor Series. It will also assume knowledge about complex numbers. I will post a note on these topics.

The class will be computation-based, so familiarity with proof is not required. For interested students, I will post proofs in notes or exercises.

4 Homework

There is no homework! Each week I will post exercises that review the topic in class; you can choose to do some of them, but it's completely voluntary. I will also post a few challenge problems; hand in their solutions to get a small prize!