

# Math 1260: Complex Analysis

**Professor:** Jeremy Kahn

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**Office Hours:** Thursdays 11–12 or by appointment

**Class Time:** TuTh 1–2:20

**Location:** Barus & Holley 157

**Course web page:** <https://www.math.brown.edu/~kahn/math1260.html>

**Textbook:** *Complex Analysis* by Gamelin. It is available in the bookstore for about \$60, and a slightly lower quality copy is available direct from Springer (with a Brown login) for \$25. The book is also available for free as a PDF from the Springer site or the Brown library

**Weights:** The final grade will be determined by a weighted average: 50% homework, 50% final.

**Homework:** Homework will be assigned every Thursday, starting Sept. 12. The assignments will appear on the course webpage. It is strongly recommended that you complete the homework by the following Thursday, and absolutely required that you turn it in by the class on Tuesday after that, twelve days after the homework is assigned. No late homework will be accepted. The lowest homework grade will be dropped.

**Reading Period:** While there will be no required material taught during the Reading Period, there may be some supplementary lectures depending on the interest of the class.

**Course Goals:** This course is an introduction to functions of a complex variable, particularly those such functions that have a complex derivative. We'll begin with a review of complex numbers and basic functions on them, and then define the complex derivative and verify that it has many of the properties of the real derivative. Then we'll prove the Cauchy Integral Theorem, and see that it implies that functions with a complex derivative have many nice properties, such as being given locally by a power series. This will in turn lead to the Residue Theorem and its many applications. If time permits we will cover the Riemann Mapping Theorem.

Much of the beauty of complex analysis lies in the connection it provides between analysis and geometry. In this sense it feels more geometric than real analysis and more analytic than topology or even differential geometry. Emphasis will be placed on writing rigorous proofs, often in the language of analysis, while maintaining an effective geometric intuition.