

Math 205B: Complex Analysis

Course Syllabus

UC Davis, Spring 2023

Instructor: Dan Romik

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1 Summary

- **Course lectures:** MWF 2:10-3:00, Olson 117
- **Course instructor:** Dan Romik (romik@math.ucdavis.edu)
- **Instructor office hours:** Tue 11:00-11:50, MSB 2218
- **Course prerequisites:** MAT205A

2 Course description

The course will cover a selection of advanced topics in complex analysis, including both the basic theory and applications to number theory and geometry. Some specific topics to be covered are:

- The Euler gamma function and the Riemann zeta function
- The prime number theorem
- Elliptic functions
- Modular forms
- Asymptotic analysis
- Solution of the sphere packing problem in 8 dimensions

3 Course textbook

- The course is based on my book “[Topics in Complex Analysis](#)” that is scheduled to be published by DeGruyter in Fall 2023. Since the book is not currently available for purchase, I will provide a free copy to any student participating in the course.

4 Grading

Grading will be based on two project assignments designed to develop your complex analysis, mathematical writing and/or computational skills.

- **Midterm writing project.** A 2–3 page writeup on a mathematical topic of your choice with some connection to complex analysis. This could be a summary of an interesting theorem, paper, book chapter etc you read, with some definitions, a statement of the results, and a sketch of the ideas used in the proof. Or it could be a written solution of several book exercises, or computer code with an interesting calculation or visualization, etc.

Timeline:

- Please let me know what topic you have selected for the midterm project by **Friday, April 28**
- Submit the project by **Friday, May 5**

- **Final project.** An 8–10 page writeup on a mathematical topic of your choice with some connection to complex analysis. This is expected to be a detailed discussion of some interesting result or topic in the theory, including proofs written at a good level of polish and precision. For a computational project, the project can take the form of code running in some standard computing environment. The code should be well-documented and there should be an accompanying writeup of at least 2–3 pages explaining what the code does and the underlying mathematical ideas.

Timeline:

- Please let me know what topic you have selected for the project by **Friday, June 2**
- Submit the project by **Friday, June 16**

Additional project guidelines. All written projects should be typeset in LaTeX or other standard mathematical typesetting software, formatted as a standard academic paper, and contain your name, a title, an abstract, and a bibliography.

5 Ethics policy

- You are expected to be aware of the [UC Davis Code of Academic Conduct](#) and comply with it. Any violation will be reported to the [Office of Student Support and Judicial Affairs](#).
- You are allowed to use any online resource and computer software, including AI chatbots such as ChatGPT, for assistance in writing your projects. All sources you use must be cited. If you used ChatGPT or similar assistants, your project should include a statement estimating the scope of the assistance you made use of. (Also, keep in mind that ChatGPT as of today does not always give correct information, particularly on technical questions; naturally you are responsible for the content of your project being correct.)

6 Students with disabilities

If you are entitled to some form of accommodation or would like to receive an accommodation, e.g., based on a disability, please let me know as soon as possible so that we can discuss any relevant details. Please refer to the [Student Disability Center](#) with questions about accommodations.