

MATH 344: LINEAR ANALYSIS II

Fall 2023

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Course Web Page: https://www.egcharalampidis.com/teaching/344_F23/math_344_F23/

Class Meetings:

- TR (Section 1): 9:10-11:00am (38-148)

Office Hours: TR 11:15am-12:45pm, or by appointment.

Suggested Textbooks:

- *Elementary Differential Equations and Boundary Value Problems*, Authors: William E. Boyce and Richard C. DiPrima, Publisher: John Wiley & Sons.
- *Differential Equations and Linear Algebra*, Authors: Stephen Goode and Scott Annin, Publisher: Pearson.

Additional References:

- *Differential Equations and Linear Algebra*, Authors: Gilbert Strang, Publisher: Wellesley - Cambridge Press.
- *A Unified Approach to Boundary Value Problems*, Authors: Athanassios S. Fokas, Publisher: Society of Industrial and Applied Mathematics (SIAM).

Objectives: This course is the second part of the Linear Analysis sequence (Math 244-Math 344) offered at Cal Poly San Luis Obispo covering foundational methods and techniques primarily used for (linear) ordinary differential equations (ODEs) and partial differential equations (PDEs). In particular, we will discuss upon the Laplace transform, power series methods, Fourier series techniques as well as orthogonality of functions and Sturm-Liouville theory.

<https://content-calpoly-edu.s3.amazonaws.com/math/1/documents/344.pdf>

Class Material by Topic: During the quarter, we will cover the following topics from the main textbook:

- Laplace transform methods
- Power series methods
- Fourier series methods and their extensions
- Orthogonality of functions and Sturm-Liouville theory (if time permits)

A tentative schedule is posted on the course web page under “Syllabus and Tentative Schedule.”

Course Prerequisites: Math 206 and Math 242, or Math 241 and Math 244, or equivalent.

Homework and Exams: In every Mathematics course, it is extremely important you put your best effort towards solving problems and producing high-quality homework. Alongside this, it is also important to learn how to communicate your mathematical reasoning.

In that light, there will be (almost) weekly **written** homework assignments that will be posted in Canvas. Each assignment will consist of a group of problems and your task will be to write up solutions for each one.

No late homework will be accepted.

Please keep in mind that you will be rewarded not only for getting a correct answer but most importantly for the structure and presentation of your work.

Of course, struggling through a question in the homework is not something unusual. Mathematics is all about **study** and **practice** and the only way to learn is for you to work through any difficulties. With that said, and before you make an attempt to solve the homework problems, make sure that you write the accompanying theory down on

a piece of paper as many times as possible until you master it. Then, come back to the problems in the homework assignment and attempt to solve them. Such a way of studying will not only help you to create your own study guide but to understand the material in depth. Keep in mind that in order you to get the best grade you can, the first step is to do every assignment to the fullest extend of your ability. However, if you still need help, I strongly encourage you to make use of my office hours (think of them as free tutoring).

There will be **one in-class exam** and **one cumulative final**. For their schedule, see below the “Important Dates” section of this document. Before **any exam**, I will hold outside the regular class time review sessions according to:

Review session for midterm Tuesday, October 24, 4:10-6:00pm (180-112)

Review session for final Thursday, December 7, 4:10-7:00pm (53-206)

In all review sessions, we will be solving practice problems. Most importantly, please collect any of your questions and I would be more than happy to answer them!

Grading Policy and Exams: Your final grade in this course is computed according to:

Homework	35%
Midterm	30%
Final Exam	35%

Important Dates and Academic Holidays:

Midterm	Thursday, October 26
Veteran’s Day	Friday, November 10
Thanksgiving Break	Monday-Sunday, November 20-26
Last day of classes	Friday, December 8
Final Exam (Section 1)	Tuesday, December 12, 10:10am–1:00pm

Class Policies:

- All exams are **paper and pencil** exams.
- All exams will be closed-book. Exams are primarily based on the material we cover in class and the homework.
- Absolutely no formula sheets and class notes are allowed during midterm and final exams.
- If a calculator is needed during the exams, I will let you know in advance to bring one.
- **Attendance is mandatory**. However, an **excused absence** can be allowed only if the reason for your absence falls into any of the categories listed in the following page:

<https://academicprograms.calpoly.edu/academicpolicies/class-attendance>

Please inform me as soon as possible if you are seeking to make up missed work pursuant to the excusable reasons listed in the url above.

Students with Disabilities: The University provides disability-related support services to qualified students through the Disabilities Resource Center (DRC). If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both me and the DRC (124-119) at (805) 756-1395, as early as possible in the term. In addition, and for your convenience, their website is <https://drc.calpoly.edu/>. Note that use of DRC services including testing accommodations requires prior authorization by the DRC and compliance with approved procedures. **Make sure you initiate any needed arrangements well in advance of an exam date.**

Diversity and Inclusion: I am fully committed to an academic environment that is free of bias against any group and I firmly believe in the value of diversity in people and ideas. My ultimate goal is to establish that this class is a welcoming environment to every-one regardless of gender identity, sexual orientation, color, race, ethnicity, or religious identity. The University and I do not tolerate discrimination. Please feel comfortable coming to me if at any point you ever feel uncomfortable for any reason.