

# MATH 312.001 Concepts of Real Analysis Fall 2023

**Class meets:** Monday, Wednesday, Friday 10:10- 11:00 a.m. in 268 Willard

**Instructor:** Dr. Victoria Sadovskaya (you may call me Victoria)

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*Office:* 426 McAllister

*Office hours:* Monday 1:30- 3:00 p.m.; Wednesday 2:30- 3:30 pm.;  
Friday 12:20- 1:20 p.m.; and by appointment

**Course description:** This course provides an introduction to rigorous analytic proofs involving properties of real numbers, sequences, series, continuity, differentiation, and integration. Its goal is to develop thorough understanding of the theory behind the key concepts and results covered in Calculus courses. Mathematical exposition will be emphasized, and the students will be expected to understand and write proofs. *Prerequisite:* Math 141.

**Text:** *Elementary Analysis: The Theory of Calculus* by Kenneth A. Ross, second edition.

The students can access the text and download chapters, or the entire book, free of charge at <http://link.springer.com.ezaccess.libraries.psu.edu/book/10.1007/978-1-4614-6271-2>

We will cover the following sections: 2-5, 7-12, 14, 15, 17-20, 23, 28, 29, 32-34.

**Canvas:** The course materials, including the syllabus, daily schedule, homework assignments, announcements, and exam study guides will be posted on *Canvas*.

**Homework** will be assigned on Fridays and collected *by 5 p.m. on Thursdays via Canvas*.

*No late homework will be accepted.* The lowest two homework scores will be dropped.

Solutions of homework problems must be neatly and clearly written or typed, in complete sentences. The solutions must be logically structured, and all steps must be justified. You may use statements proved in class and results of previous homework assignments and worksheets. You may discuss general approaches to problems with me and with other students, but you must write solutions on your own. *You may not copy solutions from any source.* Homework assignments will also include exercises that will not be collected. I strongly recommend doing all suggested exercises, as this will help with understanding the course material and with exam preparation.

**Exams:** There will be two midterm exams and a two-hour cumulative final exam.

The midterms will take place in class on *Monday, October 2* and on *Monday, November 6*.

The final exam will be scheduled by the university during the final exam week, *December 11 - 15*.

All students must plan to take exams at the scheduled times. If you are unable to attend a midterm exam you should notify me promptly, before the exam if possible. If there is a compelling reason for absence, such as illness or a family emergency, your score will be replaced by the final exam score. Otherwise, the score for the missed test will be zero.

**Quizzes:** There will be short quizzes on Mondays at the beginning of the class on the material covered during the previous week. You will be asked to give definitions, state theorems, and answer true/false questions. There will be no make-up quizzes, but the lowest two scores will be dropped.

**Team worksheets:** A number of times during the semester, the students will work on problems and questions in teams. Most of these worksheets will be collected and graded. Each team will submit just one set of solutions, and all its members will get the same score.

**Grading Policy:** The final score and letter grade will be calculated as follows:

Homework:	40 %	A	91 - 100 %	C+	74 - 77.9 %
Each Midterm:	10 %	A-	88 - 90.9 %	C	70 - 73.9 %
Final Exam:	20 %	B+	85 - 87.9 %	D	60 - 69.9 %
Quizzes:	10 %	B	81 - 84.9 %	F	below 60 %
Team Worksheets:	10 %	B-	78 - 80.9 %		

**Attendance:** You are expected to attend every class. If you have to miss a class, please visit Canvas to find out what was covered and to check for announcements. You will need to study the book or get notes from your classmates to learn the material covered that day.

*Please notify me if you have to miss more than one class.*

Class attendance and participation will be considered in determining borderline grades.

**Academic Integrity** is the pursuit of scholarly activity in an open, honest and responsible manner. It is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts. Academic integrity includes a commitment by all members of the University community not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.

**Disability accommodation:** Penn State welcomes students with disabilities into the University's educational programs. Student Disability Resources (SDR) website provides contact information for every Penn State campus <http://equity.psu.edu/sdr/disability-coordinator>. For further information, please visit <http://equity.psu.edu/sdr/>. In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office, participate in an intake interview, and provide documentation (<http://equity.psu.edu/sdr/guidelines>). If the documentation supports your request for reasonable accommodations, your campus disability services office will provide you with an accommodation letter. Share this letter with your instructors and discuss the accommodations with them as early as possible. You must follow this process for every semester that you request accommodations.

**Counseling and psychological services:** Many students face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

*Counseling and Psychological Services at University Park (CAPS)*

<http://studentaffairs.psu.edu/counseling/> 814-863-0395

*Penn State Crisis Line* (24 hours/7 days/week): 877-229-6400

*Crisis Text Line* (24 hours/7 days/week): Text LIONS to 741741

**Reporting Educational Equity Concerns:** Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are not tolerated and can be reported through Educational Equity via the University's Report Bias webpage <http://equity.psu.edu/reportbias/>