

MATH 403H Honors Classical Analysis I Fall 2021

Class meets: Monday, Wednesday, Friday 2:30 - 3:20 p.m. in 268 Willard
Instructor: Dr. Victoria Sadovskaya (you may call me Victoria)
E-mail: sadovskaya@psu.edu *Phone:* (814) 863-4140
Office: 426 McAllister
Office hours: Monday & Friday 1:20-2:10 p.m., Wednesday 3:40-4:30 p.m., and by appointment

Course description: The goal of this course is to develop thorough understanding and technical mastery of foundations of classical analysis in the framework of metric spaces. The following topics will be covered: Metric spaces (open and closed sets, connectedness, convergence, Cauchy sequences and completeness); Maps between metric spaces (continuous maps and homeomorphisms, stronger continuity properties, contraction mapping principle); Compact metric spaces (continuity and compactness, total boundedness, coverings); Baire Category Theorem; Function spaces (spaces of continuous maps, equicontinuity, Arzela-Ascoli Theorem, Stone-Weierstrass Theorem).
Prerequisites: Math 311M and Math 312H.

Note: Math 403H is an honors course. Honors courses engage students deeply, creatively, and ethically with the complexities of a scholarly subject. Honors courses challenge students to examine underlying frameworks, evaluate details of a subject, synthesize those details, and create, develop, or construct an advanced perspective. The content and assessment methods of honors courses provide enhanced opportunities for independent and innovative thinking.

Text (required): *Real Analysis* by N.L. Carothers. ISBN-13: 978-0521497565.
We will cover most of the material in Chapters 2-9 and parts of Chapters 10-12.

Course web page: <http://www.personal.psu.edu/vxs137/403H/403H.html>
The course materials will be also posted on *Canvas*.

Homework will be assigned on Fridays and collected on Thursdays via Canvas. *No late homework will be accepted, except in cases of illness or an emergency.* Solutions must be neatly and clearly written (or typed) in complete sentences, they should be logically structured, and all steps should be justified. You may use statements proved in class and results of previous homework assignments. 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.* Additionally, I will assign exercises that will not be collected. I strongly encourage you to do all suggested exercises since this will help with understanding the course material.

Exams: There will be two midterm exams and a two-hour cumulative final exam. The dates of the midterms will be announced two weeks in advance. The final exam will be scheduled by the university during the final exam week, and it will be administered via Canvas. All students must plan to take exams at the scheduled times. If you are unable to take a midterm exam you should notify me promptly. If there is a compelling reason, such as illness or an emergency, your score will be replaced by the final exam score. Otherwise, the score for the missed test will be zero.

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

Homework:	60%	A	at least 90%	B-	at least 77%
Exam 1:	10%	A-	at least 87%	C+	at least 74%
Exam 2:	10%	B+	at least 84%	C	at least 70%
Final Exam:	20%	B	at least 80%	D	at least 60%

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

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

Mask guidance: Penn State University requires everyone to wear a face mask in all university buildings, including classrooms, regardless of vaccination status. *All students must wear a mask appropriately (i.e., covering both mouth and nose) while they are indoors on campus.* This is to protect your health and safety as well as the health and safety of your classmates, instructor, and the university community. Anyone attending class without a mask will be asked to put one on or leave. Instructors may end class if anyone present refuses to appropriately wear a mask for the duration of class. Students who refuse to wear masks appropriately may face disciplinary action for Code of Conduct violations. If you feel you cannot wear a mask during class, please speak with your adviser immediately about your options for altering your schedule.

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.

Students with disabilities: 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/>