

MATH 507 Dynamical Systems I Fall 2020

Class meets: Monday, Wednesday, Friday 10:10 - 11:00 a.m. in 106 Osmond

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

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Office hours: on Zoom Monday 4-5 p.m. and by appointment;
you are also welcome to send me questions by email.

Course web page: <http://www.personal.psu.edu/vxs137/507/507.html>

The course materials will be also posted on *Canvas*.

Course description: In this course we will introduce the fundamental concepts and tools of dynamics, focusing on topological properties of dynamical systems. The topics will include periodic points, equidistribution, topological transitivity and mixing, minimality, recurrence, equivalence of dynamical systems, topological entropy, and structural stability. We will discuss a variety of examples including circle maps, translations and flows on tori, symbolic dynamical systems, and hyperbolic toral automorphisms.

Prerequisite: Math 501.

Text (recommended): *Introduction to the Modern Theory of Dynamical Systems*
by A. Katok and B. Hasselblatt.

We will cover parts of Chapters 1, 2, and 3, and additional topics if time permits.

Homework will be assigned and collected weekly 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. 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.

Project and presentation: The course will include a project. You will choose a topic, study it on your own, type a report, and make a presentation on Zoom at the end of the semester. A project may include computer simulations.

Grading Policy: The grade will be based on the homework (85%) and the project (15%).

Attendance: You are expected to attend classes, if possible. *However, if you are not feeling well or if you have been in contact with someone who has COVID-19 symptoms or has tested positive, please do not come to class.* If you have to miss classes, please let me know. After each lecture, either the notes or a reference to the section of the book covered in class will be posted on Canvas. *All students, faculty and staff are required to wear a face mask in University buildings, and are expected to maintain social distancing when possible.* Masks/face coverings need to cover both the nose and mouth and stay in place at all times.

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. Every Penn State campus has an office for students with disabilities, and the contact information is provided at the Student Disability Resources website <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/>