

# MATH 497.001 Introduction to Dynamical Systems Spring 2020

**Class meets:** Monday, Wednesday, Friday 1:25-2:15 p.m. in 116 Osmond

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

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*Office hours:* Monday 10:10-11:00 a.m. and 2:30-3:20 p.m.;  
Wednesday and Friday 10:10-11:00 a.m.; and by appointment

**Course web page:** <http://www.personal.psu.edu/vxs137/497/497.html>

Homework and exam scores will be posted on *Canvas*.

**Course description:** The theory of dynamical systems is a modern branch of mathematics. Its main objective is to analyze long-term behavior of systems that evolve over time. In this course we will introduce the fundamental concepts and tools of dynamics and discuss an array of examples. The topics will include contractions, maps of a circle, symbolic systems, linear maps, hyperbolic systems, fractals, entropy, and chaos. *Prerequisites:* Math 220, 230, and 312.

**Text** (optional): *A First Course in Dynamics* by B. Hasselblatt and A. Katok.

**Homework** will be assigned and collected weekly. No late homework will be accepted, except in cases of illness or family emergency. Solutions of homework problems must be neatly and clearly written in complete sentences and logically structured. You may use statements proved in class and results of previous homework assignments. You may discuss general approaches to solutions with me and with other students, but you must write solutions on your own. You may not copy solutions from any source.

**Exams:** There will be two in-class exams. The dates will be announced two weeks in advance. If you are unable to attend an exam you should notify me promptly. If there is a compelling reason for absence, such as illness or a family emergency, you will take a make-up exam, otherwise, the score for the missed test will be zero.

**Project:** The course will include a project done in groups of 1-3 students. After the first exam, you will choose a topic for the project. Several will be offered, but you may also suggest your own topic. You will study a topic, type a report, and make a presentation in class at the end of the semester. A project may include computer simulations or solving problems.

**Attendance and participation:** You are expected to attend every class and to participate in discussions. If you miss a class, you are responsible for learning the material covered and knowing the announcements made in class.

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

Homework:	45%	A	at least 90%	B-	at least 77%
Each Exam:	15%	A-	at least 87%	C+	at least 74%
Project:	15%	B+	at least 84%	C	at least 70%
Participation:	10%	B	at least 80%	D	at least 60%

**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. Students who believe they have experienced or observed a hate crime, an act of intolerance, discrimination, or harassment that occurs at Penn State are urged to report these incidents as outlined on the University's Report Bias webpage <http://equity.psu.edu/reportbias/>