Sergei Pilyugin

Department of Mathematics

College *of* Liberal Arts *and* Sciences

MAT 6932 Special Topics: Population Persistence and Dynamical Systems (Spring 2024)

MAT 6932 Special Topics (14321)

Instructor: Sergei S.

Pilyugin https://people.clas.ufl.edu/pilyugin/courses/mat6932_s2024/

Announcements: The lectures will be delivered live in MAT 0003. Take home midterms and/or homeworks will be posted and collected in canvas.

Time and Room: MWF 3 (9:35 – 10:25 a.m.), MAT 0003.

Textbook: Dynamical Systems and Population Persistence by H. L. Smith and H. R. Thieme, GSM Vol. 118, American Mathematical Society, 2011 (ISBN 978-0-8218-4945-3).

Critical dates: Jan. 8 (classes begin), Apr. 24 (classes end).

Holidays: Jan. 15 (MLK Day), Mar. 9–16 (Spring Break).

Office Hours: MWF 4 – in LIT 458 or in zoom by appointment. Please, use e-mail: pilyugin@ufl.edu for communication. For more details, see my schedule.

Description and Objectives of the Course: This course will cover the mathematical foundations for this concept of population persistence. Specifically, we will discuss the following topics: semiflows in metric spaces and their invariant sets, compact semiflows and compact attractors, weak vs strong persistence, the role of attractors and repellers in establishing persistence, topological approaches to persistence, and average Lyapunov functions. A wide variety of examples will complement the theoretical developments.
There are no formal prerequisites, but the students will be expected to having been exposed to differential equations, linear algebra, advanced calculus and basic point topology.

Grading System: The grade is determined by the average of the homework scores. The resulting score determines the letter grade according to the following table

Letter Grade	A	A-	B+	B	B-	C+	C	C−	D+	D

Score	100 – 93	92 – 88	87 – 83	82 – 77	76 – 71	70 – 65	64 – 59	58 – 53	52 – 47	46 – 40

Course policies:

UF Covid-19 policies: For policy updates please refer to the University of Florida list of Covid-19 related FAQ at https://coronavirus.ufl.edu/faqs/ .

Closed-book policy: No use of calculators, or books will be allowed during in-class quizzes.

Grading disputes: Any issues or questions about the grading of exams must be brought to the instructor's attention within one week after the exams are returned to the class.

Excused absences: In certain circumstances, a student will be able to make up a missed quiz. These circumstances could include medical situations, family emergencies, travel for University activities (eg. band, debating club, etc), and religious observances. In these cases the student must inform the instructor before or within one week after the missed work and **provide written documentation.** All make ups must be taken during the final exam time slot.

Policy on class attendance: Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx
Most students benefit a great deal from attending class regularly. Arriving late and/or leaving early, reading the newspaper, looking at your cell phone, etc. disrupts the class and is rude and unprofessional.

UF Honor Code: "UF students are bound by The Honor Pledge which states: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TA's in this class."

Diversity statement: The University of Florida and the Department of Mathematics are committed to diversity
and inclusion of all students. We recognize the diversity of backgrounds and learning needs of our students and strive to create a more inclusive and welcoming environment for everyone. We strongly believe that an inclusive learning environment promotes higher academic achievements.

For students with disabilities: "Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester."

Related Links

[CLAS IT](#)

[College of Liberal Arts and Sciences](#)

[UF Mathematics](#)

[University of Florida](#)

Online evaluations: Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at https://gatorevals.aa.ufl.edu/. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open.

Contact information for the Counseling and Wellness Center: https://counseling.ufl.edu/, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.