

Fall 2024

SYLLABUS

<i>Course title</i>	Mathematical Epidemiology
<i>Course number</i>	MAT 6932
<i>Schedule, Room</i>	MWF 8 , Lit 217
<i>Instructor</i>	Maia Martcheva maia@ufl.edu http://people.clas.ufl.edu/maia/
<i>Office Hours</i>	In person: M6th period, Zoom: by appointment
<i>Main theme</i>	An Introduction to Mathematical Epidemiology

Goals: Students will be introduced to the topic of infectious disease modeling on population level. Students will develop skills to form and analyze simple mathematical models of infectious diseases. Further, they will develop skills to compute the basic reproduction number.

Topics:

- (1) Introducing the SIR and SIS models.
- (2) The SIR Model with demography. Techniques for analysis of 2x2 ODE systems.
- (3) Modeling vector-borne diseases. Delay equations.
- (4) Building more complex ODE epidemic models. Techniques for computation of \mathcal{R}_0 .
- (5) Fitting ODE epidemic models to data.
- (6) Structural and practical identifiability

Prerequisites: No graduate prerequisites. Familiarity with differential equations and elementary linear algebra will be useful. Coding will be done in Mathematica or Matlab. Knowing these CAS or having desire to learn them will be useful.

Requirements:

- (1) Students will be expected to make presentations. In particular, each student will present a paper of choice. Alternatively, students may make a presentation on their current research projects if related to mathematical epidemiology.
- (2) There will be some homework problems assigned which will be completed in teams.
- (3) Students will be expected to attend class.
- (4) We will use Mathematica and Matlab for computation. Having access to the software may help you learn more in the class.

Grading: Grades will be based on (1) Attendance; (2) Presentations; (3) Homework.

Special Accommodations:

Students requesting classroom accommodations or special arrangements during examinations must first register with the Disability Resource Center

<https://disability.ufl.edu/>

The DRC will provide documentation. The student must then present this documentation to instructor to meet the requesting accommodation. This should be done as early in the semester as possible.

Academic Honesty:

Students are expected to know and follow the Code of Student Conduct. In particular, students must refrain from cheating, not make their work available for cheating, give due credit and citation for any quoted work, and make only fair use of copyrighted materials and software. You are expected to take exams and quizzes on your own and complete the homework within your team. The university has a policy on academic honesty, which should be followed.

U Matter We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu (or see <http://umatter.ufl.edu/>) so that the U Matter, We Care Team can reach out to the student in distress. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Course Evaluation:

Students are invited to provide feedback on the quality of instruction in this course by completing online evaluations at <https://ufl.bluera.com/ufl>. 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. Summary results of these assessments are available to students at <https://gatorevals.aa.ufl.edu/public-results/>