

Fall 2019

SYLLABUS

<i>Course title</i>	BIOMATHEMATICS SEMINAR 1
<i>Course number</i>	MAP 6487
<i>Schedule, Room</i>	MWF 7 , MAT 115
<i>Instructor</i>	Maia Martcheva maia@ufl.edu http://people.clas.ufl.edu/maia/
<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. Each team will also grade the homework of another team.
- (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.