

ZOO 4926 – Special Topics in Zoology: Pandemic Dynamics

SPRING 2021

Instructor: Thomas J. Hladish (tjhladish@ufl.edu)

Office: Carr 417 Hours: Scheduled as needed

Course website: Log in @ <http://elearning.ufl.edu>

Course location and time: FLG 0260, TH 13:55 – 16:55

Text: None required

Infectious diseases pose complex problems that require synthesis across many disciplines. Pandemics add additional challenges because of the urgency of an effective response, and rapidly changing data and knowledge about what is happening.

In this course, we will first develop an understanding of how to characterize and quantify the spread of infectious diseases, and then dig into the particular challenges of understanding and responding to an epidemic as it unfolds: biases in empirical data, triangulating data sources to support/eliminate hypotheses, effective communication (with the public, policy makers, media, etc.), and types of public health responses, including their scale, timing, impact, and costs/benefits. We will focus primarily but not exclusively on SARS-Cov-2 and COVID-19: this is the pandemic we know the most about, but studying historical pandemics and other pathogens can offer critical insights into the next pandemic we face.

This is primarily a discussion-based course, and thus student engagement is critical. There will be few lectures and no tests, but a lot of emphasis on critical thinking and effective oral and written communication.

Prerequisites: BSC 2011 and 2011L with minimum grades of C and undergraduate advisor permission.

COURSE REQUIREMENTS AND ASSESSMENT

Class participation	20%
Simulation assignment	10%
Written/media assignments (3)	30%
Presentation	10%
Final project	<u>30%</u>
	100%

Grading scale: Course grade is based on percentage of total possible points earned. To make things convenient, the expected possible total is 100 points. 'A' grades correspond to [90%, 100%], 'B' grades correspond to [80%, 90%), 'C' to [70%, 80%), 'D' to [60%, 70%), 'E' to [0%, 60%). Ranges are further subdivided into thirds for assigning +/-; for example a 'B+' corresponds to [86 $\frac{2}{3}$ %, 90%), and an 'A-' to [90%, 93 $\frac{1}{3}$ %). Exceptions: there is no 'A+', 'E+', or 'E-'.

Attendance, participation and engagement: Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. [Click here to read the university attendance policies.](#)

Class meetings: Attendance at class meetings is mandatory. The class will generally meet for three hours on Thursdays, as scheduled below. Changes to the schedule, e.g. to accommodate a guest lecturer or to deal with unpredicted logistical challenges, will be announced with as much advance notice as possible and made in coordination with other scheduled activities. Due to the active learning nature of the class, your presence and participation are essential. Any missed classes for reasons other than sickness will be penalized by a 1 point (==5%) deduction from your participation grade. If you are sick and thus absent, please notify me within 24 hours by email. Class is offered for a letter grade; no S/U option is possible. The topics listed below are examples of what we will

discuss in class, but I will work to incorporate students' interests that are within the scope of the course. We will also incorporate topics related to ongoing or emerging epidemics.

Date	Topic	Assignment due
01/14/21	Syllabus & perspectives on infectious diseases	
01/21/21	Mathematical models of disease transmission	Lock-down essay
01/28/21	Interpretation and estimation of reproduction numbers	
02/04/21	Modes of disease transmission	Simulation
02/11/21	Reporting lags & systematic data biases	
02/18/21	Interventions: types, impact, and limitations	
02/25/21	Vaccine development and trials	Intervention advocacy
03/04/21	Public health organizations & their role	
03/11/21	Predicting disease dynamics and burden	
03/18/21	Agent-based modeling of COVID-19	Press release
03/25/21	Ethics: information, vaccine trials & compassionate drug use	
04/01/21	Historical pandemics & pandemic potential	Presentations
04/08/21	Open discussion	
04/15/21	Final project: group work	Final project outline
04/22/21	Reading day	
04/29/21	Final project: presentations	

Class participation: Class participation is extremely important. Whether you are highly knowledgeable about the topic at hand or completely ignorant, I expect you to be engaged and contributing by providing either insights or questions. There is no penalty for being wrong—that happens all the time in science. Knowing the answer is great, but thinking carefully and making intelligent guesses is more important: “truth” changes in science, but rigorous thinking is constant.

Most class days after the first will have required readings that will be the basis for that day's discussion. Readings will be provided on Canvas at least 5 days before the discussion. On days with assigned readings, you must do the reading prior to coming to class. Please come to class prepared with three questions you have, about or prompted by the reading.

SIR simulation assignment: The intent of this experiential assignment is to help you understand what it's like to do research in mathematical epidemiology. As in research, a critical part of the assignment is figuring out what you need to do. Do not be put off by confusion and uncertainty! I will provide critical background knowledge, but you will have to make decisions about how to fulfill the assignment.

You will use simulation software called EpiFire to explore the relationship between how infectious a disease is and how many people end up getting infected. You will design a simulation experiment, produce data, and create a figure illustrating the relationship you discover. This figure should be accompanied by a ~100 word caption explaining (not describing) the relationship, and any details I would need in order to reproduce your experiment.

Short essays & media assignments: Effective communication during a pandemic is critical, and takes many forms that we will consider, including persuasive writing, public outreach, press releases, and presentations. The format and style will vary to suit the topic and goal of the communication. The emphasis here will be on quality over quantity, with work evaluated based on whether it is clear, persuasive and concise, with appropriate stylistic choices and use of sources, as applicable. Assignment details will be provided to you on Canvas and reviewed in class no later than the week before the due date.

For the first assignment, write a ≥ 300 word persuasive essay: consider our in class discussions and your own sources, and argue that lock-downs are either a fundamentally necessary or fundamentally unnecessary part of pandemic response. Additional details will be provided on Canvas.

Late assignments will be penalized 5 points each day or fraction thereof.

Final project: For your final project, you will work in small groups to prepare a high-quality article (think *New Scientist*) and oral presentation about a recent event or discovery within the scope of the course. The audience you are writing for is well-educated and scientifically literate, but not necessarily experts in your subject—essentially, your classmates. Your article should incorporate illustrations or images, and citations from primary literature. Your final project grade will depend both on your individual work, and on the results of your collaborative work.

COVID-19 PRACTICES AND POLICIES

We will have face-to-face instructional sessions to accomplish the student learning objectives of this course. In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom interactions.

- You are required to wear approved face coverings at all times during class and within buildings. Following and enforcing these policies and requirements are all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.
- This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations.
- Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
- Follow your instructor's guidance on how to enter and exit the classroom. Practice physical distancing to the extent possible when entering and exiting the classroom.
- If you are experiencing COVID-19 symptoms ([Click here for guidance from the CDC on symptoms of coronavirus](#)), please use the UF Health screening system and follow the instructions on whether you are able to attend class. [Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms](#).
- Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. [Find more information in the university attendance policies](#).

UNIVERSITY AND PROGRAM POLICIES

Academic Integrity: All students are required to abide by the Academic Honesty Guidelines of the University. The UF Honor Code reads: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." 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." For more information please refer to <http://www.dso.ufl.edu/studentguide>.

Accommodations: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. [Click here to get started with the Disability Resource Center](#). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Grade points and UF grading policies: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Course evaluation process: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. [Click here for guidance on how to give feedback in a professional and respectful manner](#). Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via ufl.bluer.com/ufl/. [Summaries of course evaluation results are available to students here](#).