

Class Times and Location: MWF 2:30 - 3:20 p.m. in Brace Laboratory.

Professor: Richard Rebarber, Avery 330, rebarber@unl.edu. If you have any questions, e-mail me to make a Zoom appointment (you can also contact me through Canvas email). Also, I'll be available after most class periods.

Teaching Assistants: Lawrence Seminario-Romero (lsesminario-romero2@huskers.unl.edu), Stephen Becklin (sbecklin2@huskers.unl.edu)

Prerequisites: Two of MATH 221, MATH 221H, MATH 314, MATH 314H, RAIK 270H, STAT 380. This semester Math 221 (or any introductory differential equations class) will be especially useful.

Course Documents: All Course Documents will be kept on Canvas.

Textbook: We will occasionally use *An Introduction to Mathematical Epidemiology* by Maia Martcheva. This book is available on Canvas, and also for download at the UNL Libraries website.

Course description: This semester in Math In The City we will focus on modeling infectious diseases, especially COVID-19. Approximately the first six weeks of the course will consist of lecture, homework and in-class activities designed to get you comfortable with epidemic modeling. During the rest of the course you will be doing a group project.

Journals: There are electronic files that you will continuously update throughout the semester. A template will be provided and you will submit your journals electronically every Monday starting January 24. During the first part of the course you will use your Journal entries to let us know what material you have questions about - if you don't have any questions, say so. Once we start the projects, your Journal entries will give details about what work you personally did on the project; we will use this part of the journals to determine your project participation.

Homework: During the first half of the course, there will be occasional homework assignments. You are encouraged to discuss the problems with your colleagues and instructors, but you have to write up anything you hand in by yourself. Sometimes homework will be done in class so you can talk to us and your fellow students. You are expected to upload a clear file (PDF, JPEG, or PNG) with organized and clean work. Usage of an app to scan your work is recommended, for example, Microsoft Office Lens or Evernote Scannable are free. A sloppy, convoluted work that is not readable for grading may (shall) be returned without grades and you need to arrange for a resubmission.

Project: Around 6 weeks into the semester, the class will work together to formulate some projects, and you will choose which project you wish to work on. You and your group will be to find references and learn material that is specific to your project, and to find relevant data. We will be available to answer questions and give suggestions. About two weeks before the project is due, you will hand in a rough draft so that we can give you pointers about how to improve the report.

Final Report: Part of understanding advanced concepts and doing research is describing these concepts and that research in writing. Therefore, the quality of your written exposition will be graded. Guidelines for good technical writing will be discussed in class. The Final Report

will be due Wednesday of Finals Week. The grade on the Final Report will be the same for all members of a group. The project participation grade may vary between members of a group.

Data: Most of the projects will use data. There is a huge amount of data that is publicly available, and part of the project will be to find and use relevant data.

Technology : You are allowed to use any software/programming language. You will write your reports in LaTeX, using the online environment Overleaf so that everybody in your group can work on the same file easily. We will provide LaTeX training.

During the second half of the semester, it might be helpful to bring a laptop to class. During the first half of the semester I might suggest bringing your laptop to some classes.

Do not use cellphones or other technology in class unless you are looking up information relevant to projects.

Final presentation: During Dead Week we will have a mini-conference where all groups can present their work. This will be advertised in the Math and Biology Departments, and will be open to anybody who is interested. Each group will be given 30 minutes to present their work. Taking part in the group presentation is compulsory and you are expected to adjust your schedule accordingly. Please attend the talks from the other groups if you can. Later in the semester details about what should be in the presentation will be given.

Illness Policy: If I cannot come in for class because of illness, I will give the class via Zoom (I'll send a link via email) or ask Lawrence and/or Stephen to take over.

If you cannot attend class because of illness *before* we start working on projects, please use the detailed written course material (notes, description of class activities) that will be on Canvas. Also, make sure you let me know if you miss a class, so I can give you a rundown of what you missed. If you have trouble with any of the material, find a time to Zoom with me, Lawrence or Stephen.

If you cannot attend class because of illness *after* we start working on projects, if you're feeling well enough you should Zoom in to your group meetings.

Grading: Grades for the course will be computed as follows:

- Homework = 25%
- Final project report = 25%
- Project participation = 20%
- Final presentation = 22%
- Attendance and Class Participation = 8%

University Policies: Policies on Academic Honesty, Services for Students with Disabilities, Mental Health and Well-Being Resources, Inclusiveness, and Title IX can all be found at <https://executivevc.unl.edu/academic-excellence/teaching-resources/course-policies>. You can ignore the parts about the Final Exam, since we don't have a Final Exam.

Course Evaluation: The Department of Mathematics Course Evaluation Form will be available through your Canvas account during the last two weeks of class. You'll get an email when the form becomes available. Evaluations are anonymous and instructors do not see any of

the responses until after final grades have been submitted. Evaluations are important - the department uses evaluations to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

ACE Outcome: This course satisfies ACE Outcome 10.

- Generate a creative or scholarly product that requires broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection.

The outcome objectives will be demonstrated by a written report, an oral presentation, group meetings, and assignments or quizzes. The lectures and group meetings will provide the skills necessary for these assignments. Anonymous copies of your group written project and a sampling of journal entries will be kept as examples of the scholarly product that requires broad knowledge, appropriate technical proficiency, information collection, synthesis, interpretation, presentation, and reflection.