TUFTS UNIVERSITY DEPARTMENT OF MATHEMATICS
Course Information Math 87 – Mathematical Modeling and Computation Spring 2020

https://sites.tufts.edu/mathmodels

Instructor: Moon Duchin ⟨ moon.duchin@tufts.edu ⟩ Bromfield-Pearson 113 / Barnum M35
Course Meetings: D+ block (Tue/Thu 10:30-11:45) in BP 2. There will be a few guest lectures and make-up classes in evenings, particularly one or two in the Thursday 6-8 slot.
Office Hours: Fridays 8:30-10 in Barnum M35 and by appointment.

TA: Mackenzie McPike ⟨ mackenzie.mcpike@tufts.edu ⟩ Bromfield-Pearson 300
Office Hours: Thursdays 12-2 outside BP 300

Text: none. I'll link to online materials and I'll make lecture notes from previous semesters available. For the linear programming material, I will loosely follow the excellent book *Linear Programming* by Chvátal.

Description: The #1 job of this class is to introduce you to the mathematics of modeling—creating formal structures to predict, explain, or track observed phenomena. I'm going to use the chalkboard during class time to give you the theory, and then you'll be working solutions on paper and interacting with python notebooks to internalize the material. Learning to typeset mathematics is one of the ancillary goals of the course. The course is set up so that you can use it as an opportunity to learn python (and there is a Coding Lab to support that). The course is also set up to make you interested in thinking critically about how models work (and there is a Reading Lab to support that).

Problem Sets: Roughly one problem set per week, typically due Mondays at noon, in hard copy or electronically on Canvas. Mackenzie and I will have office hours on Thursdays and Fridays. You may (and **should**) collaborate in your work on the problems, but **your solutions must be written in your own words**. Important note: this class is quite large and assessment will be complicated; we really truly won't be able to accept late assignments for a score.

Tests Etc: There are no conventional tests, but there are two midterm projects. These resemble weekly homework except that the writeup is supposed to have the structure of a more polished report. There is also a final project on a modeling problem of your choice that you will do in groups of 3-4. You will form teams by early April, choose a project topic by mid-April, submit the written project by Sunday May 3, and present your work in our final exam slot on Monday May 4.

Grades: I like to grade all assessment components (HW and project elements) on a scale of 0-4, where 4 means "nailed it!", 3 is mostly right, 2 is a good start, 1 is a start :), and 0 means blank or not responsive. A complicated problem might be broken down into several 4-point parts. At the end of the term, you'll get a total score made up of 40% HW, 15% for each midterm project, and 30% for the final project. I will use my professional judgment to convert this to letter grades that reflect your mastery of the material and the completeness of your work. In my courses, an 80% average at the end of the term typically earns an A. I love to give As.

Learning Objectives: The course aims to provide students with a solid conceptual foundation in applied mathematics; the course will be taught in accordance with all six items from the list of learning objectives for mathematics.

`http://ase.tufts.edu/faculty/committees/objectives/math.htm`

Academic Integrity: This is always important, but especially so in a course with so much project-based work. I expect clear communication about your sources and resources, and I expect you to turn in work that contains your own ideas and formulations.

`http://students.tufts.edu/student-affairs/student-code-conduct/`

Disability Services: If you are requesting an accommodation due to a documented disability, you should contact the Accessibility Services Office at the *beginning* of the Semester.

`http://students.tufts.edu/student-accessibility-services`

However, talk to me! I'm committed to making this class accessible to everyone whether or not you go through that office.