Math 462, Section 201: Projects in mathematical biology

http://www.math.ubc.ca/~coombs/tch/462/462.html

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Class hours: 3.30pm-5pm, Tuesday and Thursday.
Location: LSK 460.

Topics

The biological topics for this class will be determined in part by student interests. We will study scaling and dimensional analysis, discrete and continuous models, and stochastic and deterministic models. Students will:

- learn techniques for effective modeling of biological systems
- study and criticize published modeling studies
- become comfortable with reading primary biological modeling literature
- complete a final project on a topic of their choosing, including oral and written presentation

Activities

- Final grades will be assigned as follows: Homework and written work 50%, Project 40%, Active participation in class 10%.
- Every week (except week one), a paper from the literature will be assigned for study. I will discuss the paper in brief and explain what is required on each Thursday's class. On Tuesday you have to bring your preliminary written work and be prepared to present it to the class. This will form the basis of the in-depth discussion of the paper which will take up most or all of the class time. The final written component will be due at, or before, Thursday's class. Late write-ups will not usually be accepted.
- Final versions of write-ups must be typed. You may email me your write-ups (as PDF only) or provide me with a hard copy in class. Please do not turn in your work under my door, to the math office, etc. Keep your PDF file size small (<10MB) to avoid problems.
- There will additionally be one or two homework sets. Late homework will not usually be accepted. Homework can be hand-written and should be turned in, in class on the due date.
- A final project will be proposed by students (probably in groups), written up, and presented. Full details for the final project will be discussed in class.
- There will not be a final exam.

Reading list (will be completed during the semester)

- Paper review 1. The hydrodynamics of water strider locomotion. D.L. Hu, B. Chan and J.W.M. Bush. Nature 424:663-666 (2003).
- Paper review 2. Kinetics of self-assembling microtubules: An "inverse problem" in biochemistry. H.

Flyvbjerg, E. Jobs and S. Leibler. PNAS 93:5975-5979 (1996).

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