

Mathematical Biology (Math 5120)

Lecture : MWF 10:45–11:35, JWB 208

Instructor: Aaron Fogelson, LCB312, phone 581–8150, email: fogelson@math.utah.edu
Office hours: TBA

TA: Karin Leiderman, LCB317, karin@math.utah.edu
Office hours: TBA

Course Web Site: http://www.math.utah.edu/~fogelson/5120_s09

Text: No official text. Material will be taken from a variety of sources including:

1. L. Edelstein-Keshet, *Mathematical Models in Biology*, SIAM, 2005.
2. G. de Vries, T. Hillen, M. Lewis, J. Muller and B. Schonfisch, *A Course in Mathematical Biology: Quantitative Modeling with Mathematical and Computational (Monographs on Mathematical Modeling and Computation)*,
3. J.D. Murray, *Mathematical Biology 2nd Ed*, Springer-Verlag, 1993.
4. H. C. Berg, *Random Walks in Biology*, Princeton University Press.
5. N. Britton, *Essential Mathematical Biology*, Springer, 2003.
6. F. Hoppensteadt and C. Peskin, *Modeling and Simulation in Medicine and the Life Sciences, 2nd Ed*, Springer, 2002.
7. J. Keener, *Mathematical Physiology*, Springer, 1998.

Material Covered: The emphasis will be on partial differential equation models in biology and on stochastic models in biology. The biological topics will be diverse but with an emphasis on physiology.

Problem Sets: To be given out approximately every two weeks and will be due two weeks later unless announced otherwise. Homework is due when stated, late work will generally not be accepted. You may work in groups, but each student should submit an individually written solution set. Answers will be posted on line at the course web site. Check the course web site for homework assignments if you miss class.

Computing: MATLAB will be used for some homework assignments. We will have an introduction to MATLAB with relevant examples if needed.

Project: The project will be based on suggested reading in mathematical biology. You will have the option to choose a subject suggested by me or to choose your own subject. The project is a 5–10 page written paper reviewing the subject, and a half hour class presentation. Your project grade will be based on the written paper (25 out of 30 points) and class participation (5 out of 30 points). You will not be graded on your presentation. A list of suggested subjects will be handed out in February.

Evaluation:

Homework Problems: 40%; Exam: 30%; Project: 30%

Prerequisite: Math 5110

ADA Statement: The Americans with Disabilities Act requires that reasonable accommodations be provided for students with physical, sensory, cognitive, systemic, learning and psychiatric disabilities. Please contact me at the beginning of the quarter to discuss any such accommodations for the course.