

MATH 118 AND MATH 119 - MATHEMATICAL BIOLOGY I AND II: SPRING 2006

Professors: Lisette de Pillis, Yixin Guo, John Milton, Elissa Schwartz
M/W 1:15pm - 2:30pm
Olin B143

1. Office Hours.

Professor:	L.G. de Pillis	J. Milton
Days:	TBA	TBA
Time:	By appointment, drop-in	Email and drop-in
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2. Topics. In addition to the textbook, you will be exposed to topics of current research interest to each of the Professors involved in the course, each of whom is an expert who works in a different area of mathematical biology. This will enrich your exposure to many of the areas that are of current interest in the field.

Math 118. (2 units)

Title: Topics in Mathematical Biology I.
Description: Mathematical models of biological processes emphasizing modeling. May include models in epidemiology, population dynamics, cancer modeling, and disease treatment modeling.

Math 119. (2 units)

Title: Topics in Mathematical Biology II.
Description: Mathematical models of biological processes emphasizing modeling. May include one- and two-locus population genetics, meta-populations, and matrix population models as well as models in physiology and neurobiology.

3. Textbooks and Readings. The textbook for the course is:

- “Essential Mathematical Biology,” by Nicholas F. Britton, Springer-Verlag, 2003. ISBN: 1-85233-536-X.

An additional recommended resource is

- “Mathematical Models in Biology: An Introduction,” by Elizabeth S. Allman and John A. Rhodes, Cambridge University Press, 2004. ISBN: 0-521-52586-1.

When appropriate, we will make additional readings and journal articles available either as handouts or as online documents.

4. Coursework. There will be assigned readings, presentations to develop on some of the readings, and some in-class mathematical and computational exercises. There will also be a final report to complete (per half-course).

5. Grading. For each course: Your final grade will be based on your participation in class, attendance, write-ups and presentations, and your final report. Attendance and participation are required to pass this course. You may have one unexcused absence (per course). Each absence thereafter may reduce your overall course grade.

6. Semester Schedule. Topics covered in the Math 118 and Math 119 courses vary, but will likely include: Discrete and continuous population growth; single and interacting metapopulations; Leslie matrices; age structured modeling; predator-prey modeling and functional response; disease modeling and SIR models, including epidemics, eradication, and control; tumor modeling; population genetics; environmentally stable strategies (ESS); Hodgkin-Huxley modeling; phenotypic plasticity; pattern formation and diffusive instability.