

# Math 172, Mathematical Modelling for the Life Sciences

**Instructor:** Prof. Adela Vraciu

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**Office Hours:** MWF 11–12.

**Text:** *A Primer of Ecology* by N. Gotelli, Sinauer Press, 2007, 4th ed., 2008. We plan to cover Chapters 1–6.

**Graphing Calculator:** TI-83 or TI-84, required. Please note that the TI-86 calculator does not have some of the functions that will be used in this class.

**Prerequisite:** Grade of C or better in Math 122 or Math 141.

**Overview:** The goal of the course is to enable you to form mathematical models of changing real world situations, such as population growth, analyze these models and interpret the results in the context of the original problems. We will use a blend of verbal, pictorial, numerical, graphical, and analytic (formula-based) methods.

**Learning Outcomes:** Students will understand the concepts of and be able to solve problems drawn from biological modeling with differential and difference equations; techniques of model modification; analytic, numerical, and graphical solution methods; equilibria, stability, and long-term system behavior; geometric series; vectors and matrices with applications to population dynamics.

**Grades:** There will be three exams during the semester, and a final exam. There will be a quiz almost every week, based on homework assigned previously. Homework will be assigned, but it will not be collected. The problems assigned for homework will serve as the basis of the quiz we have that week. Only the ten highest quiz scores will count. No make-ups will be given for quizzes or exams. The score you get in the final exam (scaled accordingly) can be used to replace the lowest exam score during the semester, if better.

Three exams during the semester	$3 \times 100 = 300$
Final Exam	200
Quizzes	100

The letter grades are assigned as follows: 525 points or above: A; between 465 and 525 points: B; between 400 and 465 points: C; between 300 and 400 points: D; less than 300 points: F. This scale might be adjusted to match the performance of the class (curve).

The dates for the three exams during the semester are as follows:

**Exam 1:** February 9; **Exam 2:** March 4; **Exam 3:** April 8

If you have serious conflicts with any of these dates, please let me know as soon as possible.

**Final Exam:** April 29, 2–5pm.