

Computer Modeling in Evolution and Ecology

Spring Quarter 2012

Instructors: Lin Chao and Scott Rifkin

Teaching Assistant: Sidney Kuo

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Location: York 1310

Lecture times: 10:00 – 10:50AM

Lab times: 11:00AM -2:00PM

Prerequisites: BIEB 150 or BIEB 100. Alternative classes to be approved with permission by instructor.

Text: Web based; to be announced.

Grading: Final grade will be based on total based on weekly exercises, quizzes, and a final exam (practical).

Weekly lab reports: Homework: Turn in program code and output (even if the program is not working) by emailing to email to: bieb143Spr12@gmail.com
Include write up indicating whether program worked or not and parts of program you do not understand. If it did not work, explain what you tried and where you think that bug could be.

- This is a course for students who want to improve their ability to use quantitative, mathematical, and statistical models in biology by learning to use and write computer code. Students will be developing their own programs instead of using programs prepared by software developers.
- A degree of familiarity and desire to work with mathematical reasoning will be required.
- This is not a course for advanced students in computer science. Only basic beginning code writing will be taught. All programming will be in the language R.
- The exercises implemented in this laboratory course build heavily on exercises assigned previously in the class. The completion of weekly assignments will be required and students are advised to prepare themselves to meet these deadlines.
- Quizzes and exams are planned to be open notebook but not open computer. You are encouraged to keep a lab notebook with notes and copies of handouts, which can be accessed during the tests.

BIEB 143

Date	Topic
4-Apr	Introduction to Programming in R.
6-Apr	
11-Apr	Generating Random Distributions by Monte Carlo methods.
13-Apr	
18-Apr	Debugging and discussion of programming strategies.
20-Apr	
25-Apr	Population Genetics: Probability of fixation estimated by Monte Carlo methods.
27-Apr	
2-May	Population Genetics: Probability of fixation estimated by numerical methods.
4-May	
9-May	Population Ecology: Predator Prey model
11-May	
16-May	Class Project: Evolutionary Game Theory and Constructing the Arena
18-May	
23-May	Class Project: Competition between lab students
25-May	
30-May	Class Project: Evolving your player
1-Jun	
6-Jun	Class Project: Who evolved the best player?
8-Jun	