Course Description
Theoretical and empirical views of the structure and function of populations from across the tree of life, emphasizing the integration of ecological and evolutionary approaches.

Instructor
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Office hours
Scheduled office hours: MWF 1330-1430 or by appointment
Open door policy: I want to talk with you about population biology. Please stop by my office anytime that is convenient for you. If I am not immediately available, I will be happy to setup an appointment at another time.

Prerequisites
(MTH 241 [D-] or MTH 251 [D-] or MTH 251H [D-] or MTH 227 [D-]) and (ST 351 [D-] or ST 351H [D-]) and (ST 352* [D-] or ST 411* [D-]) and (BI 311 [D-] or BI 311H [D-] or BI 370 [D-] or BI 370H [D-])
*May be taken concurrently

Course work
This course combines approximately 30 hours of instruction and activities for 3.0 credits.

Exam times
Exam 1: Friday, Feb 3, 2017, in class
Exam 2: Friday, March 3, 2017, in class
Final exam: Thursday, March 23, 2017, 6pm
Weekly schedule of lecture topics

Week 1: Introduction
Week 2: Exponential growth
Week 3: Age structure, density dependence
Week 4: Logistic map, cycles, chaos, Exam 1
Week 5: Population genetics
Week 6: Evolution of life histories
Week 7: Interacting species, functional and numerical responses, generalized Lotka-Volterra
Week 8: Review, Exam 2
Week 9: Ecology and evolution of infectious diseases
Week 10: Space—the final frontier in population biology

Learning Outcomes

Students will be able to:

1. Critique the importance of population biology to the life sciences, and to the achievement of the United Nations Sustainable Development Goals

2. Define, contrast and synthesize the concepts of abundance, distribution and diversity

3. Explain the concept of stability verbally, diagrammatically, and with reference to mathematical models

4. Interpret data on population abundance over time in terms of growth and regulation

5. Formulate and critique simple models of population dynamics

6. Relate population genetic patterns to population dynamics

7. Interpret individual behaviors such as dispersal in an evolutionary context

8. Recognize the potential impacts of population structure on growth and viability
Course materials
Required:

Hardcopies available at the OSU bookstore, and on reserve at the Valley Library

Recommended background reading:

_Chapters 9 – 11._
Available at the OSU bookstore, and on reserve at the Valley Library.

A note on the required text
Hasting’s text has mathematics in it. I hope you will find that the meanings of the equations are clear, as we engage with the underlying biology. In fact, the only prior knowledge of math we need is what you saw in your first term of calculus. Occasionally the text uses more advanced mathematics. You are not responsible for the details in those parts – we will clarify the take home messages where needed.

Evaluation of Undergraduate Student Performance
Grading will be based on a combination of three examinations (exam 1, exam 2, and a final) and in-class activities.

Exams
Exams 1 and 2 will be in class, in weeks 4 and 8. Questions that are answered incorrectly by a majority of the class will not be used to determine grades.

In class activities - quizzes
Starting in week two, each class will begin with a brief quiz. If you are up to date with the material and prepared for lecture, the quiz should be easy. Quiz questions that are answered incorrectly by a significant majority of the class will not be used to determine grades.

In class activities – group work
The classroom will be a cooperative environment where we all work together to achieve learning. During most lectures, students will work in small groups to complete in-class activities. The output from these activities will be evaluated and will contribute to the in-class portion of your final grade.

Grade determination - undergraduate
Exam 1: 20%
Exam 2: 20%
Final exam: 30%
In-class activities: 30%
Course policies

Regarding Exams
Attendance at all exams is required. Please plan your schedules accordingly. Photo ID is required at all exams. Make-up exams are not given. If you have an urgent and serious illness or another emergency that prohibits your attending the exam, you must contact the instructor ASAP to be made aware of the consequences or discuss alternatives. All submitted responses on exams are final – you will not be credited with answers that you did not bubble and your bubbled TF number will not be subject to change once submitted.

Student Conduct
Choosing to join the Oregon State University community obligates each member to a code of responsible behavior, which is outlined in the Student Conduct Code, available at http://studentlife.oregonstate.edu/sites/studentlife.oregonstate.edu/files/code_of_student_conduct.pdf. This Code is based on the assumption that all persons must treat one another with dignity and respect in order for scholarship to thrive. In particular, academic dishonesty, as outlined in the Student Conduct Code, will be penalized according to OSUs regulations, which include, but are not limited to, receiving an “F” in the course.
Mobile Electronic Devices in Lecture
The purpose of lectures is to engage with course material by face-to-face interaction among students and instructors. All lecture materials will be posted online so you do not generally need to copy down information, although you may choose to make notes as you reflect on the material being discussed. The hope is that you can devote all your attention to thinking about the material, and interacting with your colleagues in the room. In this context, the use of smartphones, tablets, laptop computers etc. during class is detrimental to everyone’s learning, and is prohibited. Students found to be using these devices during lecture will be asked to leave, and will forfeit their grade for in-class activities that day. If you would like to use a mobile electronic device in lecture as part of an accommodation for a disability, you must obtain approval from OSU Disability Access Services (DAS).

Statement Regarding Students with Disabilities
Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at http://ds.oregonstate.edu. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Diversity Statement
The College of Science strives to create an affirming climate for all students including underrepresented and marginalized individuals and groups. Diversity encompasses differences in age, color, ethnicity, national origin, gender, physical or mental ability, religion, socioeconomic background, veteran status, sexual orientation, and marginalized groups. We believe diversity is the synergy, connection, acceptance, and mutual learning fostered by the interaction of different human characteristics.

Religious Holidays
Oregon State University strives to respect all religious practices. If you have religious holidays that are in conflict with any of the requirements of this class, please see me immediately so that we can make alternative arrangements.

Disclaimer
This class is a work in progress. I may change the schedule, policies, and assignments in this course due to extenuating circumstances or by mutual agreement between the instructor and students.