

Fall 2015

BIOS 2014

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BIOS 2014: Population Genetics Evolution and Ecology

SYLLABUS -- Fall 2014

Prerequisites: C or better in BIOS 1073, BIOS 1071, and MATH 1125 or higher

Schedule: Lectures meet on Tue-Thu 11-12:15. The four Lab sections meet on Tue 2-4:45, Wed 2-4:45, Wed 5:00P-7:45 and Thu 2-4:45. Lab sections have different instructors (see below), and you will know their office hours when you attend the first lab.

Professor:

Dr. Carla Penz

Office: SCI 2093, Phone: 280-1142, Email: cpenz@uno.edu

Office Hours: Mon 1-3 pm, Tue 1-3 pm, Wed 1-3 pm, or by appointment

Lab Instructors:

Tue 2-4:45 pm: Liz Sigler, Email: esigler@uno.edu

Wed 2-4:45 pm and Wed 5-7:45 pm: Trent Santonastaso, Email: tsantona@my.uno.edu

Thu 2-4:45 pm: Carla Penz, Email: cpenz@uno.edu

Text book: *Evolution*, 1st edition, by C.T. Bergstrom & L.A Dugatkin, Norton.

Learning Objectives:

- Understand the importance of Evolution for the study of Biology in general.
- Understand phylogenetic reconstruction.
- Understand the basis of Mendelian inheritance and the origin of genetic variation.
- Understand how evolutionary processes such as selection and genetic drift affect genetic and phenotypic variation.
- Learn about species concepts and the reasons why this is a difficult problem in Biology.
- Understand some of the mechanisms that lead to speciation.
- Understand that extinction is a natural process, and the consequences of such process.
- Understand particular biological attributes and phenomena, such as sociality and coevolution, which provide an interface between Evolution and Ecology.
- Understand basic ecological principles of demography, and population regulation.
- Understand how competition and predation affect population and community-level organization.

Attendance policy:

Lecture attendance is strongly encouraged, but there is no need for an excuse slip if you need to miss a lecture. **Laboratory attendance is mandatory**. Absence from lab will only be excused if permission is obtained in advance from your laboratory instructor, or if a doctor's excuse is presented. In some cases, labs can be made up *within the week of the lab* if you obtain permission from both your regular lab instructor and the instructor of the lab you would like to attend. Unexcused absence from lab will result in a grade of zero for that lab worksheet.

Student conduct:

Students should maintain good study habits (take notes, read assigned book chapters), and problems should be addressed early (while there is still time for improvement). Please refrain from talking during lecture, as it disrupts other students and also the professor. **The use of cell phones is prohibited in class, labs, and exams.** If you must be reachable by cell phone during lab or class, please turn off the ringer. If you must use the phone during lab, please step out of the room. Respect your professors and classmates: do not 'text' during lecture or lab.

Grading:

Exam 1: 27% of the grade

Exam 2: 27% of the grade

Exam 3: 27% of the grade

Optional cumulative Final: replaces the lowest exam grade.

Laboratory work: 19% of the grade

Exams will include multiple-choice questions only, but some questions may require calculations. Along the semester you will receive a sample of exam questions as a self-quiz. Occasional study sheets will be posted. If you have concerns about exams, please come to office hours soon, not just on the day before the exam. **Make-up exams** will be given **only** in the case of a doctor-excused illness, death in the family, or justified emergency. **To be excused from any exam, the professor must be contacted prior to the exam via email or phone.** If you are absent from an examination without being excused you will receive a 'zero' for that exam grade (and will be advised to take the final). **Cheating on any exam will result in a 'zero' for that exam.**

The **Laboratory grade** will be based on lab worksheet grades. You will be required to turn in a worksheet at the end of each lab period. **The use of old lab worksheets of students from previous semesters is considered cheating and will result in a 'zero' for that worksheet.** No worksheet grades will be dropped.

Grading standards:

A: 90% and above; B: 80-89%; C: 70-79%; D: 60-69%; F: below 60%

Academic integrity:

Academic integrity is fundamental to the process of learning and evaluating academic performance. Academic dishonesty will not be tolerated. Academic dishonesty includes, but is not limited to, the following: cheating, plagiarism, tampering with academic records and examinations, falsifying identity, and being an accessory to acts of academic dishonesty. Refer to the Student Code of Conduct for further information. The Code is available online at <http://www.studentaffairs.uno.edu>.

Students with certified disabilities:

It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities should contact the Office of Disability Services as well as their instructors to discuss their individual needs for accommodations. For more information, please go to <http://www.ods.uno.edu>.

SCHEDULE OF CLASSES, LABS AND EXAMS

Thu Aug 20	Lecture: Information about class, Introduction to Evolution Reading: selected topics of Ch 1 & 2
Lab of the week:	no lab this week

Tue Aug 25	Lecture: Natural selection Reading: Ch 3
Thu Aug 27	Lecture: Phylogeny and Evolutionary history Reading: Ch 4 and Ch 5 p 137-146
Lab of the week:	Hypothesis testing

Tue Sep 1	Lecture: Mendelian genetics, The origin of genetic variation Reading: Ch 6
Thu Sep 3	Lecture: The genetics of Populations 1 Reading: Ch 7 p 203-215
Lab of the week:	Systematics

Tue Sep 8	Lecture: The genetics of Populations 2 Reading: Ch 7 p 216-239
Thu Sep 10	Lecture: The genetics of Populations 3 No reading, in class exercises instead
Lab of the week:	Mendelian Genetics

Tue Sep 15	Lecture: Evolution in finite populations 1 Reading: Ch 8 p 243-257 and 265-271
Thu Sep 17	Lecture: Evolution in finite populations 2 Reading: Ch 8 p 272-287
Lab of the week:	Hardy-Weinberg

Tue Sep 22	EXAM 1
Thu Sep 24	Lecture: Evolution at multiple loci 1 Reading: Ch 9 p 291-312
Lab of the week:	Population Genetics 1

Tue Sep 29	Lecture: Evolution at multiple loci 2 Reading: Ch 9 p 313-330
Thu Oct 1	Lecture: Species and speciation Reading: Ch 14 p 455-482
Lab of the week:	Population Genetics 2

Tue Oct 6	Lecture: Extinction and evolutionary trends, Coevolution Reading: Ch 15, Ch 19 (selected topics)
Thu Oct 8	Lecture: The evolution of sex Reading: Ch 16
Lab of the week:	Phenotypic Variation

Tue Oct 13	Lecture: TBA
Thu Oct 15	<i>Fall Break, no lecture</i>
Lab of the week:	no lab this week

Tue Oct 20	Lecture: Sexual selection Reading: Ch 17
Thu Oct 22	Lecture: Evolution of Sociality Reading: Ch 18
Lab of the week:	Territoriality and Sexual Selection

Tue Oct 27	EXAM 2
Thu Oct 29	Lecture: Population size and growth Reading: Download from Moodle
Lab of the week:	Cemetery Demography

Tue Nov 3	Lecture: Temporal and spatial population dynamics Reading: Download from Moodle
Thu Nov 5	Lecture: Species interactions Reading: Download from Moodle
Lab of the week:	Optimal Foraging

Tue Nov 10	Lecture: Consumer resources 1 Reading: Download from Moodle
Thu Nov 12	Lecture: Consumer resources 2 Reading: Download from Moodle
Lab of the week:	Lotka-Volterra

Tue Nov 17	Lecture: Competition Reading: Download from Moodle
Thu Nov 19	Lecture: Community structure 1 Reading: Download from Moodle
Lab of the week:	no lab this week

Tue Nov 24	Lecture: Community structure 2 Reading: Download from Moodle
Thu Nov 26	<i>Thanksgiving Holiday, no lecture</i>
Lab of the week:	no lab this week

Tue Dec 1	Research talk: case studies in evolution and ecology
Thu Dec 3	EXAM 3
Lab of the week:	no lab this week

Date TBA	OPTIONAL cumulative FINAL

PGEE LAB

Rules and Expectations

Carla Penz (S-004: Th 2 – 4:45 pm): cpenz@uno.edu
Trent Santonastaso (S-002 W 2 – 4:45, S003 W 5 – 7:45):
tsanton1@uno.edu
Elizabeth Sigler (S-001: Tu 2-4:45): esigler@uno.edu

Grading:

Your lab grade is worth 19% of your class grade and is determined by 12 lab worksheets due at the end of each lab period. There is neither homework nor are there examinations of any sort. Your grade will be determined solely on your responses to the lab worksheets.

Labs:

At the beginning of each lab there will be a brief lecture on the lab which addresses every question you will be asked in the lab manual. Pay attention to the lecture and you should have no problem answering the questions. It is also important to read over the lab manual before coming to class. The labs are designed to fill the time allotted for the lab period. No extra time is allowed. Proper preparation and attention will ensure you complete everything on time.

As a lab group you may collaborate but please make sure your answer is your own. You will be marked off if your response is identical to someone else's. You may not use labs from previous semesters. Not only is this cheating but since we have changed all of the labs your answers are likely to be incorrect. You will get a 0 on that lab if caught cheating, and we are very good at catching it.

Do not expect your TA to give you the answer to a question. Our job is to guide you along the problem-solving path towards the right answer.

Your graded assignments will be returned as soon as everyone has completed the assignment. Usually this means the following lab but in special cases where someone needs to make up a lab this may be later. All grades will be updated on Moodle.

Absence Policy:

There are four lab sections and most of the labs are difficult to replicate outside of a lab period. If you know you will miss a lab for an acceptable reason, email your TA BEFORE your lab period and you **may** sit in on another lab section. However, since each of the sections is above capacity it is at the discretion of the other TA. If there is an emergency, you **MUST** email or notify your TA before the end of your lab period the day you have lab in order to make it up (if possible). Make up labs are only allowed 1) with an acceptable excuse and 2) if proper, prior notification is given. Please do not walk into lab a week after missing and ask to make it up. Also, **DO NOT** attend a different lab section without prior approval.

Lab Rules: No eating of any sort – if you are famished, take it outside. Only closed-top bottles or containers that won't spill if knocked over (i.e. soda cans are **not** okay). No cell phones out during lecture. Be respectful of each other and your TA (we are in charge of your grade after all). If you have questions **RAISE YOUR HAND!!!** We will answer you in turn but will not be able to help you if we don't know you need it! On the same note, please be patient. Your TA will answer your question as best as possible and in order.

Computer Policy: You are only allowed to use the computer when instructed by your TA. Should you be caught using the computer without permission, you forfeit your lab grade for that class period; basically you get a ZERO for that lab.