Population Biology – Syllabus
BioSc 1320/2320.- Fall 2018 (2191)

***Instructor*:** Dr. Martin Turcotte
204A Clapp Hall
412-624-4635, turcotte@pitt.edu

Lecture Time: **Monday + Wednesday, 4:30 - 5:45 PM, A224 Langley Hall**

Virtual Office Hours: **Wednesdays 5h45-6h45 + Thursdays 1-2**
I will hold virtual office hours using a discussion in Top Hat. I will be online at the assigned time and will answer questions relating to the course material and course-related issues. Office hours are also available by appointment.

Course Description: This course focuses on ecological and evolutionary processes at the population level. We will learn how to represent ecological and evolutionary dynamics using increasingly realistic mathematical models. We will first explore Population Ecology including models of single populations, meta-populations, and interactions between species. We then shift to Population and Evolutionary Genetics studying how the mechanisms of evolution interact with each other. Finally, we will study the explicit interaction between ecological and evolutionary processes that can occur over short timescales.

Prerequisites: You must have passed Ecology (BIOSC 0370 or 037) or equivalents (BIOL 1430 or 1515) with a C or better before taking this course.

Required Textbooks: Most of the assigned readings come from:

A Primer of Ecology by NJ Gotelli

A Primer of Ecological Genetics by JK Conner and DL Hartl

These books are also on reserve in Langley Library. Other required readings will be made available on Top Hat.

Required Electronics:

1) Bring a charged, Top Hat compatible device to every class. If you do not own a compatible device, see me.
2) Bring a **scientific calculator** to all exams, one that can perform log and ln functions and exponents (for example TI-30XII $10 at Staples or Target). **Graphic calculators are not allowed.**

***CourseWeb*:** I will be using CourseWeb to post grades and to send email notices to your official university e-mail address. Please check CourseWeb regularly. See below

for the *E-mail Communication Policy.* If you need help, contact the computer help desk at 412-624-HELP.

Top Hat: **Join Code: 378306**

All material, including slides, in-class activities, practice problems, literature discussion papers and assignments, will be distributed using Top Hat. In addition, I will use Top Hat in class to give lectures, ask questions, and give quizzes and for virtual office hours. You are expected to bring a charged Top Hat compatible device to class. All Top Hat functions used in this class are now free to Pitt students. If you are caught answering Top Hat questions for another student or assisting a student outside the classroom with Top Hat, both of you will receive a 0 for all Top Hat related activities for the semester.

Lecture Participation: Up to 60 points (15% of your grade) can be earned from in-class activities using Top Hat. Points will be based on some combination of participation and correctly answering questions at my discretion. Most of these points can only be earned in-class. I will apply a +**10% point buffer** equally to all students. This buffer is there to mitigate missing points due to absences, tardiness, lack of a device, technology issues, etc... In-class activities will not usually be advertised ahead of the class period.

Literature Discussions: **These will take place across the hall in Langley A219B.** It is important to understand how the topics and methods we see in class apply and are used in the primary scientific literature. Students will participate in three literature discussions. Papers to read will be posted well before each discussion. Students must complete a discussion assignment and upload it to **Top Hat by 3:30 PM** on the day of the discussion. Part of the assignment will include preparing questions which you will use as a basis for group discussion. Points for discussion will be based on your assignment and participation.

Exams: There will be three examinations, on the dates given on the course schedule. Each exam is worth 100 points. Exams will include terms, definitions, interpretation of tables, graphs, equations and their parameters, and analytical problems. The questions will be based primarily on the material covered in the lectures but can include material in the required readings and general questions concerning the literature papers. The exams will test proficiency with new material since the previous exam (this includes the third exam). Because I hope you will emerge with a synthesis of material from throughout the course, questions will sometimes make use of material covered in previous exam(s).

Missed Exam: **There are no make-up exams or extra credit opportunities in this course.** You may miss one exam only under exceptional circumstances of illness, severe personal trauma, or (rarely) University business, and only if you bring a signed note from a doctor (illness), parent (personal trauma), or a University official (University

business) within one week of the exam. If you miss one exam with a valid excuse, the value of the other 2 exams increase to 150 points. If you miss more than one exam you should discuss the options available to you with your advisor or the DAS Dean's Office. Please note that you are expected to show up to each exam on time. Late arrivals will be given the exam during the time that remains. Transportation problems and weather issues are not considered an adequate excuse. If you must travel to reach campus, please allow sufficient time to ensure that you arrive before the exam begins.

Lecture and Exam Schedule: The schedule for this course is attached. The topics covered in class might not match the schedule exactly however the exams dates are firm. Please note the dates of the exams to avoid any future scheduling conflicts. The two first exams will be given during regular class time. **The final exam will be in A224 Langley on Wednesday December 12th, 12:00-1:50 PM.**

Exam Review and Regrades: Exams will be handed back in class. You will be permitted to look over the exam and ask questions, but exams **DO NOT** leave the room. You may not reproduce any part of the exam in any way while looking at your exam. No photos, copying of questions, etc. Removing an exam or answer key, or reproducing them, will result in a grade of 0 on the exam and an Academic Integrity violation. Addition time to look over exams is possible by appointment. I will discuss the most commonly missed questions in class.

You may request a regrade of an exam by submitting your request in writing and explaining why you think the grading was in error. This request must be submitted to me within one week after the date that the graded exams are returned to the class. Unless the regrade request is simply due to an addition error, please be aware that your entire exam may be evaluated and any question that was graded incorrectly (in your favor) may also be regraded resulting in points deducted from your total.

Final Grade: Your final grade will be determined on the basis of your total points earned for the semester. 400 points are possible and the following grade scale will be used:

Exams	300
Lecture Participation / In-Class Assignments	60
Literature Discussions	40
Total	400

Final Percentage	Grade	GPA
95—100%	A+	4
92—94%	A	4
90—91%	A-	3.75
88—89%	B+	3.25
82—87%	B	3
80—81%	B-	2.75
78—79%	C+	2.25
72—77%	C	2
70—71%	C-	1.75
68—69%	D+	1.25
62—67%	D	1
60—61%	D-	0.75
59% and below	F	0

G Grades: If you wish to petition for a G grade, you must submit a request for this grade change in writing, and you must document your reason(s). You will be required to make arrangements for the specific tasks that you must complete to remove the G grade. Remember that G grades, according to SAS guidelines, are to be given only when students who have been attending a course and have been making regular progress are prevented by circumstances beyond their control from completing the course after it is too late to withdraw.

E-mail Communication Policy: *Each student is issued a University e-mail address (username@pitt.edu) upon admittance. This e-mail address may be used by the University for official communication with students. Students are expected to read e-mail sent to this account on a regular basis. Failure to read and react to University communications in a timely manner does not absolve the student from knowing and complying with the content of the communications. The University provides an e-mail forwarding service that allows students to read their e-mail via other service providers (e.g., Hotmail, AOL, Yahoo). Students that choose to forward their e-mail from their pitt.edu address to another address do so at their own risk. If e-mail is lost as a result of forwarding, it does not absolve the student from responding to official communications sent to their University e-mail address. To forward e-mail sent to your University account, go to http://accounts.pitt.edu, log into your account, click on Edit Forwarding Addresses, and follow the instructions on the page. Be sure to log out of your account when you have finished. (For the full E-mail Communication Policy, go to www.bc.pitt.edu/policies/policy/09/09-10-01.html.)*

Academic Integrity: Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity, from the February 1974 Senate Committee on Tenure and Academic Freedom reported to the Senate Council, will be required to participate in the outlined procedural process as initiated by the instructor. A minimum sanction of a zero score for the quiz or exam will be imposed.

View the complete policy at www.cfo.pitt.edu/policies/policy/02/02-03-02.html.

You may not use unauthorized materials during an exam, including notes, dictionaries, programmable calculators, pagers, telephones, smart phones, and any device that can connect to the internet. You must submit for grading only material that is written exclusively in your own words and written or drawn in your own handwriting. Violation of the Academic Integrity Code requires the instructor to submit an Academic Integrity Violation Report to the Dean's Office.

Disability Resources and Services: If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both the instructor and the Office of Disability Resources and Services, 140 William Pitt Union, 412-648-7890/412-624-3346 (Fax), as early as possible in the term. Disability Resources and Services will verify your disability and determine reasonable accommodations for this course.

Date	Lecture	Topics + Readings
27-Aug	1	**Ecological Dynamics of Populations** Intro + Estimating Pop Size: TBA Exponential Growth: Gotelli Ch. 1 Density Dependent Growth: Gotelli Ch. 2 Stochasticity: Gotelli Ch. 1 Age/Size Structure: Gotelli Ch. 3 Meta-Population Dynamics: Gotelli Ch. 4
29-Aug	2	
3-Sept	**Labor Day – No Class**	
5-Sept	3	
7-Sept	**Add/drop period ends**	
10-Sept	4	
12-Sept	5	
17-Sept	6	
19-Sept	7	
24-Sept	**Discussion 1**	Reading and Assignment TBA
26- Sept	**Exam 1**	
1-Oct	8	**Species Interactions & Population Genetics** Competition Lotka-Volterra: Gotelli Ch. 5 Competition – R* Theory: Crawley Chapter 8 (on Top Hat) Predation: Gotelli Ch. 6 Mutualism: Bronstein 1994 Disease: TBA Review of Population Genetics I + II: C&H p. 9-13, 23-44, Ch. 3
3-Oct	9	
8-Oct	10- Dr. Jiaqi Tan	
10-Oct	11	
15-Oct	**Fall Break**	
16-Oct TUESDAY!	12	
17-Oct	13	
22-Oct	14	
24-Oct	15	
29-Oct	**Discussion 2**	Reading and Assignment TBA
31-Oct	**Exam 2**	
5-Nov	16	**Evolution & Eco-Evolutionary Interactions** Life-History Evolution: TBA Quantitative Genetics + Plasticity: C&H p. 97-104, 108-125, 137-147 Measuring Selection and Predicting Evolution: C&H p. 150-65, 189-94, 199-205, 216-21 Eco-Evolutionary Dynamics I Eco-Evolutionary Dynamics II Molecular Evolution: TBA **Applied Eco-Evo I:** Conservation Genetics: TBA **Applied Eco-Evo II:** Preventing Resistance Evolution
7-Nov	17	
12-Nov	18	
14-Nov	19 – Prof. Nathan Clark	
19-Nov	20	
21-Nov	**Thanksgiving**	
26-Nov	21	
28-Nov	22	
3-Dec	23	
5-Dec	**Discussion 3**	Reading and Assignment TBA
12- Dec (Wed)	**Exam 3 12:00-1:50 PM**	