

PCB 4674 – Evolution

Sections 04H8, 7677, 7687

Syllabus for Spring 2017

I. Course Description and Prerequisites

Processes and mechanisms of evolution, including population genetics, speciation, patterns of evolution and molecular evolution. 4 credits.

Prerequisites: BSC 2010/2011 and labs or the equivalent with a minimum grade of C. Familiarity with Mendelian genetics, basic molecular biology, and high-school algebra.

II. Course Meetings

Lectures: MW periods 3-4, 9:35-11:30, Bartram 211

Labs: Section 7677 F periods 3-4, 9:35 am - 11:30 am, 109 Carr
Section 7687 F periods 5-6, 11:45 am - 1:40 pm, 109 Carr
Section 04H8 F periods 7-8, 1:55 pm - 3:50 pm, 109 Carr

First day of classes: Wednesday 04 January 2017

Last day of classes: Wednesday 19 April 2017

Final Exam*: Group 24A; Monday 24 April 2017, 7:30 am – 9:30 am *See section XII

III. Instructors

Course Instructor:

Dr. Nicole Gerlach

Department of Biology

Office: 520 Carr Hall

Office hours: In-class immediately following lecture or by appointment

E-mail: ngerlach@ufl.edu

Teaching Assistants:

Mr. Arthur Rudolph

Sections: 7677, 7687

Office: TBA

Office hours: By appointment

E-mail: rudolph3@ufl.edu

Ms. Alexandra Hernandez

Sections: 04H8

Office: TBA

Office hours: By appointment

E-mail: ahernandez6@ufl.edu

IV. Course Communications

A. Course Website: <https://ufl.instructure.com/courses/336747>

B. Contacting Your Instructors: If you have a question about course mechanics or course material that cannot be answered from the syllabus, course announcements, or the course FAQ, please post it to the Discussion Boards on Canvas (see section VIII. "Getting Help", below). If you have a question involving a personal/grade-related issue, please e-mail your TA or Dr. Gerlach, as appropriate. All e-mail

correspondence must originate from your @ufl.edu account, have your full name in the body of the e-mail, and contain “PCB 4674” in the subject line. E-mails not meeting these requirements may not be recognized by our e-mail filters, and thus may not be answered. Barring unusual circumstances, we do our best to reply within 24 hours during the week, and 48 hours over the weekend. E-mails and Discussion Board posts are typically checked at least once per day, but sometimes not more than that.

- C. **Communications From Your Instructors:** Each student is solely responsible for reading and following the instructions, guidelines and schedules in this syllabus, on the course webpage, and announced in class. Not having read the information in this syllabus, on the webpage, or in course announcements will NOT constitute an excuse for missing deadlines, assignments, or other assessments. Please set your preferences in Canvas so that you receive timely notifications of course announcements and other information.

V. Course Resources

A. Textbook

Evolution: Making Sense of Life, 2e by Carl Zimmer & Douglas Emlen. W. H. Freeman (publisher), 2016.

Textbook publisher web site:

<http://www.macmillanlearning.com/Catalog/product/evolution-secondedition-zimmer/>

A copy of this textbook is on reserve at the Marston Science Library.

B. Learning Catalytics

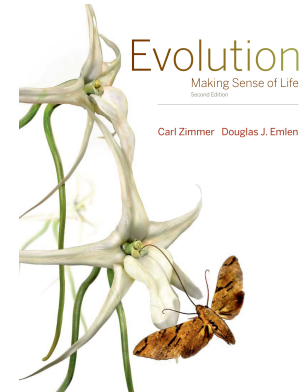
We will use the Learning Catalytics Classroom Response System for clicker/quiz questions during class, as well as for out-of-class response questions. Learning Catalytics allows students to use a laptop, tablet, smartphone, etc. to participate in a variety of types of questions. Information on correctly registering for Learning Catalytics will be available in Canvas. When setting up your account, you must use your Gatorlink (ufl.edu) e-mail address. Using an e-mail address other than your UFL e-mail address will result in you receiving NO credit for Learning Catalytics questions.

C. Course Website (Canvas)

Class material - including the syllabus, handouts, assignments, and gradebook – will be posted on the course Canvas website (<https://ufl.instructure.com>). For help with Canvas, call the UF Computing Help Desk at 352-392-4357, or visit the e-Learning support website: <http://help.instructure.com/>.

D. Course Fee

For UF students, the course fee is \$1.33.



VI. Course Objectives

This course will provide a comprehensive introduction to the current field of evolutionary biology, including the theoretical background as well as an introduction to current research in experimental evolution. By the end of this course students will be able to see how evolution provides a framework for the broader field of biology, and have a basic understanding of the major topics in evolutionary biology: the theory of evolution by natural selection, the history of evolutionary thought, population genetics, sexual and kin selection, evolutionary trees/phylogenies, and how new species form.

Lectures will cover a variety of topics within the field of evolutionary biology. We will examine the theoretical basis of these various topics in detail, break that theoretical basis down into its underlying components, and pay particular attention to the mathematical theory underlying the main conceptual ideas. We will also examine how evolutionary theory can be applied to real-world examples, particularly

in issues relevant to medicine, agriculture, conservation, and sociology. Lectures will include in-class clicker questions as well as break-out activities and discussions.

In addition to lectures there will be a series of discussions, workshop activities, and computer exercises in the context of the laboratory portion of the course. Discussions will involve readings from the primary literature followed by presentations, analysis, and/or discussion by groups of students. Computer and physical simulations will be used to illustrate a variety of concepts and methods of analysis used in modern evolutionary biology.

VII. Course Policies

A. Time Commitment

The UF College of Liberal Arts and Sciences assumes that each student will devote 3-4 hours per week per credit-hour to each course during the regular semester. Because PCB 4674 is 4 credits, each student should therefore expect to devote 12-16 hours per week to this course in a 15-week semester.

B. Attendance

Students are expected to attend all scheduled classes, and are responsible for all material presented in lecture, lab and in the assigned readings. Students who miss class are welcome to ask to borrow the notes of their classmates; the instructors will not be responsible for providing notes. Please note that no in-class quizzes, or participation points can be made up, regardless of the reason for missing class.

Expectations for lab attendance follow the above and have the following additional specifications: labs are only set up for one day each week, and simulations or discussions rely on whole-class participation, so there is little opportunity to make-up a missed lab. Notify your instructor immediately if you will miss a lab and if at all possible arrange to attend the lab for one of the other sections. Lab attendance and participation are part of your grade and there will be minimal (=no) opportunity to review the missed material if you do not attend lab. Note that labs meet once a week for two hours – plan accordingly.

C. Quizzes

Quizzes may be given at any time in lecture or lab, without notice. There will be no make-up quizzes during class or afterwards. You are required to attend your registered lab section for all lab quizzes unless you have a verifiable excuse or permission of the lab instructors involved. You must arrive within 10 minutes after the start of lab in order to take the quiz. Arriving after 10 minutes, or after the quiz has been given will result in a 0 for that quiz.

D. Exams

Students are expected to arrive on time; no extra time will be given for students who arrive late. Any material covered during the lecture period or assigned in the reading may be included in the lecture exams. This can include textbook illustrations, films, Powerpoint slides, and actual lectures. Take notes!

We will either hold post-exam review sessions or post exam keys that highlight the salient points for which credit is awarded. Please see us immediately if 1) your score is incorrectly summed, or 2) your posted score on Canvas does not agree with the score on your exam. We will consider other re-grade requests on a case by case basis, however, we will not argue about point assignments. To request a regrade, write a brief paragraph explaining why you believe your answer to a question was incorrectly scored, making specific reference to the posted key, and submit to us in office hours. Regrade requests must be submitted within one week of the exam scores being posted.

Make-up exams will **only** be available in cases of medical and/or family emergencies when documented by an accompanying letter from the Dean of Students, or for official academic activities (in which case the instructor should be contacted a minimum of two weeks in advance). The student is responsible for

scheduling timely make-up exams with the instructor. Make-up exams due to pre-arranged official academic activities may be scheduled prior to the in-class exam.

E. Late Work

Assignments should be submitted by the assigned deadline. Late work will be subject to a 20% penalty for every day it is late. For example, an assignment initially worth 10 points will be subject to a 2 point penalty if it is submitted up to 24 hours after the deadline, a 4 point penalty up to 48 hours, etc.

Graded lecture and lab assignments should be submitted to the course website by the posted deadline, unless otherwise noted. Any lab assignments for which a physical submission is required are due at the beginning of the lab session one week after the actual lab work was done, unless otherwise noted. Assignments turned in after the start of the lab session will be considered late work. If you are unable to turn in your work during your regular lab section and are not able to hand it in directly to your instructor, DO NOT leave an assignment at your instructor's office. Rather (1) make a photocopy of your assignment for safekeeping and (2) hand in the original to the staff of the departmental office (220 Bartram Hall) during regular office hours (8 am – 4 pm).

F. Classroom behavior

Readings should be done in advance of class; you are expected to come ready to discuss the topics. Please be courteous to others during both lecture and lab, particularly during in-class discussions. Students exhibiting disruptive behavior in class will be asked to leave, with the subsequent loss of participation points for that day. Use of electronic devices in class to take notes or otherwise participate in classroom activities is approved, but all electronic devices should be set to silent mode before coming to class. Approved electronic devices are laptop computers, cell phones, smart phones, tablets, iPod touch, and voice recording devices. Other uses of these devices or the use of unapproved devices will be considered disruptive. Unapproved electronic devices include video recorders, digital cameras and MP3 players.

G. Office Hours

Office hours for this course are in the lecture room immediately following lecture, or by appointment. We cannot meet with students on a drop in basis outside of posted office hours – please send an e-mail to set up an appointment before stopping by!

H. Grammar

Correct grammar, punctuation, spelling, capitalization and paragraphing should be used in any college level submission, including exams and typed reports. We will take note of spelling and grammar and we will grade accordingly.

VIII. UF Policies

A. Academic Honesty

All students registered at the University of Florida have agreed to comply with the following statement:

“I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University.”

In addition, on all work submitted for credit the following pledge is either required or implied:

“On my honor I have neither given nor received unauthorized aid in doing this assignment.”

Cases of plagiarism or other academic dishonesty will not be tolerated, and may result in assignment penalties, course grade penalties, and/or other sanctions. If you have knowledge of any instances of academic dishonesty in this class, please notify the instructor or contact the Student Honor Court (392-1631) or Cheating Hotline (392-6999). For additional information on Academic Honesty, please refer to

the University of Florida Academic Honesty Guidelines at:

<https://catalog.ufl.edu/ugrad/current/advising/info/student-honor-code.aspx#honesty>.

B. Accommodations for Students With Disabilities

Students who will require a classroom accommodation for a disability must contact the Dean of Students Office of Disability Resources, in Peabody 202 (phone: 352-392-1261). Please see the University of Florida Disability Resources website for more information at: <http://www.dso.ufl.edu/drc/>. Note that the student should provide documentation of a requirement for accommodation to Dr. Gerlach **by the second week of classes** when possible. No accommodations are available to students who lack this documentation, and accommodations are not retroactive. It is the policy of the University of Florida that the student, not the instructor, is responsible for arranging accommodations when needed. Once notification is complete, the Dean of Students Office of Disability Resources will work with the instructor to accommodate the student.

C. Drop/Add/Withdrawal

A student can drop/add during the drop add period with no penalty. After drop/add, a student who drops will receive a W until the date listed in the academic calendar. After that date, the student may be assigned an “E” (fail). Note: it is the responsibility of the STUDENT to withdraw from a course, not the instructor. Failure to participate/complete the class is NOT a drop.

D. Teacher Evaluations

Anonymous course evaluations will be open via UF’s online evaluations system (<https://evaluations.ufl.edu>) near the end of the semester; you will receive e-mail notifications of when the evaluations open.

IX. Getting Help

A. Computing Problems

For issues with technical difficulties with Canvas, please contact the UF Help Desk at:

- Learning-support@ufl.edu
- (352) 392-HELP - select option 2
- <https://lss.at.ufl.edu/help.shtml>

B. University Support Services

College can be a very stressful time in a person’s life. Resources are available on campus to help students meet academic goals and solve personal problems that may interfere with their academic performance. If you find that you are having difficulty emotionally or academically, there is substantial support available. See “[A Self Help Guide for Students](#)” or contact one of the following services:

1. [UF Counseling and Wellness Center](#), Radio Rd Facility, 392-1575
2. [Dean of Students Office](#), 202 Peabody Hall, 392-1261
3. [Career Resource Center](#), Reitz Union, 392-1601
4. [CLAS Academic Advising Center](#), Farrior Hall, 100 Fletcher Drive, 392-1521

C. Other Questions

If you have non-tech-support questions about other aspects of the course, check the following sources first to see if it is already answered, **before** e-mailing your instructors:

- Course Syllabus
- Course Announcements (this is the primary means that your instructor has to communicate with you in a timely manner)
- Course FAQ Discussion Boards

If you still cannot find the answer to your questions:

- If it is a question that others might find useful to know the answer to as well (regarding the course material, specifics of an assignment, etc.), post it to the discussion boards.
- If it is a question specific to you (e.g. account or grade specific), contact Dr. Gerlach or your TA via e-mail.

X. Assessments and Grading

A. Course Structure

Final grades will be based on performance in both lecture and lab.

	Graded Item	Percent of Final Grade
Lecture:	Lecture Exam 1	15
	Lecture Exam 2	15
	Lecture Exam 3	15
	Lecture Participation	15
	(includes Learning Catalytics, Evolution in the News presentation, Evolutionary Seminar attendance, and other in-class participation/quizzes)	
Lab	Lab Participation	20
	(includes lab homework and lab quizzes)	
Term Project	Term Project	20

B. Assignments

1. Evolution in the News

Each student will give a short presentation (~5-7 minutes) in lecture during the course of the semester; sign-ups will be available on Canvas. This presentation will count towards the lecture participation score. Each presentation will involve a recent (within the past two weeks) story from the general media that involves evolution. In addition to discussing the news story, students should find and read the original research / peer-reviewed journal article related to the study, and discuss how well the news media covered / interpreted the original research. For full credit, students must submit a brief summary of their report, including citations and links to both the news story and the original research, along with any slides they wish to use to the course website by the night before their presentation.

2. Evolution Seminar

Each student will be required to attend at least one evolution-related research seminar on campus and write up a short report during the course of the semester. Seminars and special events must receive prior approval as being relevant to our course. Relevant events will be posted on the Upcoming Seminars of Interest discussion board, but you should feel free to approach me *in advance* if you learn of another opportunity that may be appropriate. Write-ups must be submitted within one week of the date of seminar to be counted for credit.

3. Term Project

Students will work in pairs to write a research proposal addressing a novel, unanswered evolutionary question. The proposal will summarize previous work and describe two linked evolutionary experiments using a real organism that addresses concepts relevant to the course. The objectives of this assignment are to enable you to:

- explore an evolutionary question and system in depth
- become familiar with current research in evolutionary biology
- build your skills at reading and evaluating primary literature
- develop your scientific thinking such that you can create solid logical arguments and insightful experiments to test your hypotheses
- develop your writing skills such that you can convince others that the work you are proposing is both feasible and interesting.

This proposal will be done in several stages, including 1) an initial submission of the question to be asked, 2) a bibliography of related literature, 3) an initial submission that will go through the process of 4) peer review, and 5) a final submission. More information about each of the component assignments involved will be posted on the course website.

IMPORTANT: Term project questions need to be something that can be tested experimentally, and should be both novel and interesting. Questions such as “How did [particular cool trait] evolve?” are difficult to work with experimentally, particularly if there is currently limited variation in the trait. Questions that fall into the category of “Will [X] evolve if I do [Y]?” are experimentally tractable, but not particularly novel or interesting. Students are not expected to actually carry out the experiments they propose, but they should be realistically feasible within the scope and time frame of a typical grant (i.e. no monitoring sea turtle populations for the next 50 years, no introducing predators to the Galapagos Islands, etc.).

C. Extra Credit

While each student is required to attend at least one evolution-related seminar during the course of the semester (see section X.B.2, above), students may optionally attend additional seminars and submit a summary / response write-up of these seminars for extra credit. The same guidelines as above regarding

eligible seminars and submission of write-up within one week of the date of the seminar apply. Students may submit up to three extra credit seminar write-ups, one corresponding to (and due by) each of the three lecture exams. No individualized extra credit opportunities will be available.

D. Grading

Minimum grade cutoffs are listed below. These cutoffs will not be raised; in other words, if you receive 93% of the possible points, you are guaranteed to earn an A grade. A curve may be applied to individual exams or to the final scores, depending on the class average, and will be communicated clearly. However, we will *not* adjust or round-up grades on an individual basis for any reason.

Point Range (%)	Letter Grade
≥ 93	A
≥ 90	A–
≥ 87	B+
≥ 83	B
≥ 80	B–
≥ 77	C+
≥ 73	C
≥ 70	C–
≥ 67	D+
≥ 63	D
≥ 60	D–
< 60	E

Note that the current UF policy for assigning grade points is available at the following undergraduate catalog web page: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

E. **Incomplete (“I”)**: If a student has completed the majority of the course work and particular DOCUMENTED circumstances prevent completion of the course in the time allotted, the student may, with the agreement of the instructor, be assigned an “I” pending resolution of the grade. All incompletes MUST be resolved by the end of the following term or the student will receive a grade of “E” (failing).

F. Special Treatment

Please do not request individual special treatment regarding grading at the end of the semester; **we do not adjust grades for individuals for any reason**. Plan to do well on all exams, quizzes, and other assignments from the beginning of the semester; if you are having difficulty in the class, please let your instructors know sooner rather than later.

XI. Disclaimer

This syllabus represents the current plans and objectives; however, schedules, requirements, and assignments may change throughout the semester as the need arises. Such changes, communicated clearly, are not unusual and should be expected.

XII. Weekly Schedule

NOTE: The following schedule is tentative; lecture topics and coverage may change. Updated schedule and specific reading assignments will be posted on the course website throughout the semester.

Week #	Lecture #	Date	Lecture Topic	Chapter	Lab Topic
1		M 05 Jan	DROP/ADD – NO CLASS		NO LAB
	1	W 04 Jan	Intro to Evolutionary Biology	1	
2	2	M 09 Jan	History of Evolutionary Theory	2	History of the Earth
	3	W 11 Jan	Geology and Paleontology	3	
3		M 16 Jan	MLK JR. DAY – NO CLASS		Phylogenies I
	4	W 18 Jan	Reading Phylogenies	4	
4	5	M 23 Jan	Building Phylogenies	4, 9	Phylogenies II
	6	W 25 Jan	Making Inferences Using Phylogenies	4	
5	7	M 30 Jan	Understanding Variation	5	Alleles, Genotypes, Phenotypes
	8	W 01 Feb	Hardy-Weinberg Equilibrium	6	
6		M 06 Feb	EXAM 1		Population Genetics
	9	W 08 Feb	Natural Selection I	6, 8	
7	10	M 13 Feb	Natural Selection II	6, 8	Quantitative Genetics
	11	W 15 Feb	Heritability and the Breeder's Equation	7	
8	12	M 20 Feb	Selection Gradients	7	Natural Selection in the Wild
	13	W 22 Feb	Correlated Selection	7	
9	14	M 27 Feb	Molecular Evolution	9	Natural Selection Paper discussion
	15	W 01 Mar	Adaptation and Novelty	10	
		M 06 Mar	SPRING BREAK – NO CLASS		NO LAB
		W 08 Mar	SPRING BREAK – NO CLASS		
10	16	M 13 Mar	Adaptation and Evo-Devo	10	Museum Activity
		W 15 Mar	EXAM 2		
11	17	M 20 Mar	Evolution of Sex, Sexual Selection I	11	Sexual Selection
	18	W 22 Mar	Sexual Selection II	11	
12	19	M 27 Mar	Sexual Selection III	12	Hawk-Dove
	20	W 29 Mar	Evolution of Social Behavior	12, 16	
13	21	M 03 Apr	Allopatric Speciation	13	Speciation
	22	W 05 Apr	Sympatric Speciation	13	
14	23	M 10 Apr	Macroevolution	14	Term Project Presentations
	24	W 12 Apr	Coevolution	15	
15	25	M 17 Apr	Special Topics (TBA)	TBA	NO LAB
		W 19 Apr	EXAM 3*		

*Exam 3 is currently scheduled for the last day of class but may be moved to the scheduled final exam slot; see section II. If this change occurs it will be clearly communicated via Canvas course announcements.