

Instructor: Dane C. Ward, Ph.D.
Office Hours: Mon/Wed 11am-12pm, PISB 302 or by appointment
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Class Meetings:
Section 001 – M,W,F 12:00pm – 12:50pm in PISB 106

Recommended Text: Evolution, 4th Edition - Douglas J. Futuyma, Mark Kirkpatrick
Sinauer Associates (Oxford University Press)
ISBN 978-1605356051

Overview of the Course:

The present course surveys the major topics in evolutionary biology, introducing students to the fundamental mechanisms and patterns of evolution that help us to understand the incredible diversity of life. In this course, we will explore the history of evolutionary thought, learn about the fundamental forces of evolution and how they interact, discuss the history of life on earth, and learn how to apply evolutionary concepts to real world problems. Throughout the course students will be given hands on assignments where they will apply the theory discussed in lecture. These projects include simple mathematical problems involving population genetics, reconstructing a phylogeny from character data, and exploration of speciation mechanisms in real taxa. Students will be made aware of the important connections that evolutionary concepts have in the medical, forensic, agriculture, technology, and conservation fields whenever possible.

Upon completion of this class students should be able to:

- Identify the principal forces of evolution and understand how they interact to create the processes and patterns we see today
- Describe the major events in the history of life on earth and recognize how these ancient events shaped the current world we live in
- Understand how population genetics/microevolution leads to speciation and macroevolution and higher levels of diversity.
- Recognize the connections between evolutionary concepts and real world applications in multiple industries and technologies.

Course Components:

The course includes three 50-minute lectures and one 50-minute recitation class per week.

Lecture

Lecture attendance and participation is 5% of your grade. **We will be using the Top Hat (www.tophat.com) classroom response system in class.** You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or via text message (SMS). Attendance is mandatory, but **up to two classes may be missed without penalty** (e.g. illness, interview, family emergency). So if you have three or more absences (for any reason), then only the first two will be excused.

You can visit <http://tinyurl.com/THStudentRegistration> for the Student Quick Start Guide which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system. An email invitation will also be sent to your email account (if you don't receive this email, you can register by visiting our direct Top Hat course URL <https://app.tophat.com/e/321571>

Top Hat will require a subscription. There are three options to choose from:

- \$24 for 4 months of unlimited access
- \$36 for 12 months of unlimited access
- \$72 for lifetime* access

Exams

The exam format will be a combination of multiple choice (mostly) and short answer.

The **DO NOT COUNT** option: During Exam 1 or Exam 2, if you think you are doing poorly, you may write 'DO NOT COUNT' on the top of your exam, give your exam and questions to a TA and quietly leave the room. You will not be penalized for this and the potential points for that exam will be transferred to your cumulative final exam. Your Final Exam will then be worth 50% of your grade. You may use this option once, on Exam 1 **or** Exam 2, **BUT NOT ON BOTH EXAMS.**

Under no circumstances will you be allowed to drop your lowest grade for exams that you have already taken. (Don't even ask.) Once you take an exam, it counts. If you do not show up to the exam, you will not be able to take the Do Not Count option.

There will be **no makeup midterm exams** in this course. If you have a valid University approved reason for missing an exam, you must contact Dr. Ward to explain your absence either prior to, or **within 24 hours after the missed exam**. If you fail to contact the professor within that 24-hour period, you will receive a zero for that exam. If, and only if, the professor determines that you had a valid and University approved reason for missing an exam, your final course grade will be *prorated*, that is, based on your other scores.

Some important notes on this policy:

- **If you do not have a valid and University approved reason for missing the exam, you will receive a zero for that exam.**

- **No student is permitted to miss the final.** If you miss the final and you have a valid and University approved reason for doing so, you will receive a grade of Incomplete, and will have to make-up the exam after the academic quarter is over.
- If you miss two exams in the course for any reason, you will be advised to withdraw from the course, or, if the withdraw deadline has passed, you will be asked to take an Incomplete. If you wish to remain in the class, the second exam missed will receive a score of zero.

Recitation

- Attendance in recitation is required.
- If you miss recitation you must contact your recitation TA, Johannes, within 24 hours of the missed session.
- Although you are allowed an excused absence (with documentation), **consistent absences will not be permitted, even if documentation is provided (e.g. illness)**. If you are consistently unwell during the quarter and must miss multiple recitations, then you may need to consider a medical withdrawal or receive an incomplete. Otherwise you will have to accept the loss of attendance points.
- If your absence from recitation is excused, your recitation grade will be prorated.
- Any unexcused absence from recitation will result in a zero for attendance that day and a zero for the material missed.
- You must be **on time** recitation. If you are more than 5 minutes late to recitation, you will be marked late and a loss of half of the attendance points for that day. If you are more than 15 minutes late, you will be marked absent and it will result in a zero for attendance that day.
- In recitation, there may be quizzes some weeks. These will be unannounced and will consist of multiple-choice questions. They are designed to keep you engaged in the course and to be studying the material throughout. In addition, they will give you an idea of the kinds of questions that you can expect on the exams.

Grading:

Lecture attendance and participation (via Tophat)	5%
Recitation attendance	10%
Recitation assignments and quizzes	20%
Exam 1 (No makeup) – Oct 17	20%
Exam 2 (No makeup) – Nov 14	20%
Cumulative Final - TBA	25%

97-100	A+	87-89.9	B+	77-79.9	C+	67-69.9	D+
93-96.9	A	83-86.9	B	73-76.9	C	60-66.9	D
90-92.9	A-	80-82.9	B-	70-72.9	C-	0-59.9	F

Academic Rigor:

While this class is intended to be fun and interesting, it is not particularly easy. The nature of the subject requires a substantial amount of memorization. However, with a reasonable amount of regular effort, most students do fine. There is a high correlation between attendance and outcome in this course. You are not compelled to attend lectures, but it is clearly in your best interest.

Disabilities:

Students with disabilities requesting accommodations need to present a current accommodation verification letter (AVL) to the Professor before accommodations can be made. AVLs are issued by the Office of Disability Services (ODS). The ODS can be contacted at: www.drexel.edu/ods, by phone at 215-895-1401, or TTY at 215-895-2299. For further information, see: http://www.drexel.edu/ods/student_reg.html

Please review the University policies on dropping a course at: http://www.drexel.edu/provost/policies/course_drop.asp

Academic Misconduct

It is assumed that you are following the guidelines for this course, as well as general student practices of honorable behavior. In situations where there is evidence of inappropriate sources of information or activity, University academic misconduct procedures will be applied. (This includes using another student's work, plagiarism, or other "cheating".) For additional information, see the Drexel Academic Dishonesty policy: http://www.drexel.edu/provost/policies/academic_dishonesty.asp

Academic Dishonesty (or Cheating):

Cheating is an extremely serious breach of academic integrity and will be dealt with **severely**, according to the guidelines set out in the Drexel Students' Handbook and can be viewed at the following address:

http://drexel.edu/studentlife/community_standards/studentHandbook/general_information/code_of_conduct/ . Portions of this policy have been included below:

“Academic Integrity: Violations of the Academic Integrity policy include, but are not limited to: 1. Plagiarism, 2. Fabrication, 3. Cheating, and 4. Academic Misconduct. The intent to violate this policy also represents a violation of this policy.” Definitions and examples of each offense, as well as sanction guidelines, are described below.

“Sanction Guidelines for Violating the Academic Integrity policy:

First/all violations: If an act of academic dishonesty is determined to have occurred, one or more of the following sanctions will be imposed, depending on the severity of the offense:

- Reduction of a course grade
- An “F” for the assignment or exam

- Failure for the entire course
- Other action deemed appropriate by the faculty member
- Any of the above sanctions with the inability to withdraw.

Examples of other action deemed appropriate include, but are not limited to, requiring the student to re-take the exam, re-complete an assignment, or complete an assigned exercise. The decision of the faculty member and the department head shall be reported to the Office of Student Conduct and Community Standards, which is responsible for maintaining student conduct records. The incident will result in an official conduct record for the student(s). Students may also be required to attend or complete an educational activity as determined by the Office of Student Conduct and Community Standards.

Second violation: Suspension or expulsion, in addition to any sanction issued from the list above.”

- ◆ The BEES Department has a **ZERO TOLERANCE** policy towards **FABRICATION, CHEATING, and ACADEMIC MISCONDUCT**. For this reason, the Department of Biology has elected to impose the **MAXIMUM PENALTY** for cases of fabrication, cheating and academic misconduct. IF an act of fabrication, cheating or academic misconduct are determined to have occurred in a course within the department after consultation between the student, faculty member and representative from the department (Department Head, or Assistant or Associate Department Head) the penalty will be **FAILURE FOR THE ENTIRE COURSE** with the inability to withdraw from the course. This penalty will be applied for first and all violations.
- ◆ **Plagiarism** is considered to be equivalent to cheating since you are copying someone else’s work without giving them due credit, and will be dealt with severely. Cases of plagiarism will be dealt with on a case by case basis with the sanction administered to be in accordance with the severity of the plagiarism, but may also result in failure of the course or other sanctions listed above.

Definitions and examples of each violations of academic integrity as defined in the Drexel Student Handbook are listed below:

“1. Plagiarism - Plagiarism is the inclusion of someone else’s words, ideas, or data as one’s own work. When a student submits work for credit that includes the words, ideas, or data of others, the source of that information must be acknowledged through complete, accurate, and specific references, and, if verbatim statements are included, through quotation marks as well. By placing his/her name on work submitted for credit, the student certifies the originality of all work not otherwise identified by appropriate acknowledgments.

Plagiarism covers unpublished as well as published sources. Examples of plagiarism include, but are not limited to:

- Quoting another person’s actual words, complete sentences or paragraphs, or an entire piece of written work without acknowledgment of the source.

- Using another person's ideas, opinions, or theory, even if it is completely paraphrased in one's own words without acknowledgment of the source.
- Borrowing facts, statistics, or other illustrative materials that are not clearly common knowledge without acknowledgment of the source.
- Copying, or allowing another student to copy, a computer file that contains another student's assignment, and submitting it, in part or in its entirety, as one's own.
- Working together on an assignment, sharing the computer files and programs involved, and then submitting individual copies of the assignment as one's own individual work.

Students are urged to consult with individual faculty members, academic departments, or recognized handbooks in their field if in doubt regarding issues of plagiarism."

"2. Fabrication - Fabrication is the use of invented information or the falsification of research or other findings. Examples include, but are not limited to:

- Citation of information not taken from the source indicated. This may include the incorrect documentation of secondary source materials.
- Listing sources in a bibliography not used in the academic exercise.
- Submission in a paper, thesis, lab report, or other academic exercise of falsified, invented, or fictitious data or information, or deliberate and knowing concealment or distortion of the true nature, origin, or function of such data or information.
- Submitting as your own written work, printing, sculpture, etc. prepared totally or in part by another."

"3. Cheating - Cheating is an act or an attempted act of deception by which a student seeks to misrepresent that he or she has mastered information on an academic exercise that he/she has not mastered. Examples include, but are not limited to:

- Copying from another student's test, exam, quiz, and/or paper.
- Allowing another student to copy from a test, exam, quiz, and/or paper.
- Unauthorized use of course textbook or other materials, such as a notebook to complete a test or other assignment.
- Collaborating on a test, exam, quiz, or other project with any other person(s) without authorization.
- Using or processing specifically prepared materials during a test such as notes, formula lists, notes written on the students clothing, etc. that are not authorized.
- Taking a test for someone else or permitting someone else to take a test for you."

"4. Academic Misconduct - Academic misconduct includes other dishonest acts such as tampering with grades or taking part in obtaining or distributing any part of an administered or unadministered test/assignment. Examples include, but are not limited to:

- Stealing, buying, or otherwise obtaining all or part of an administered or unadministered test.
- Selling or giving away all or part of an administered or unadministered test including questions and/or answers.
- Bribing any other person to obtain an administered or unadministered test or any information about the test.

- Any unauthorized action taken for the purpose of changing a grade in a grade book, on a test, or on other works for which a grade is given.
- Changing, altering, or being an accessory to the changing and/or altering of a grade in a grade book, on a test, a “change of grade” form, or other official academic records of the University that relate to grades.
- Continuing to work on an examination or project after the specified allotted time has elapsed.
- Any buying or otherwise acquiring any theme, report, term paper, essay, computer software, other written work, painting, drawing, sculpture, or other scholastic art work, and handing it in as your own to fulfill academic requirements.
- Any selling, giving, or otherwise supplying to another student for use in fulfilling academic requirements, any theme, report, term paper, essay, computer software, other written work, painting, drawing, sculpture, or other scholastic art work.
- Scientific Misconduct. See http://www.drexel.edu/provost/policies/scientific_misconduct.asp”

Course Policies

Communications:

- Students are encouraged to communicate via email. Emails are a great way to track conversations, keeping both the instructor/TA and student on the same page.
- Students can generally expect responses to emails within 24hours, but not necessarily after 5pm of any business day. If you do receive an email response outside of business hours (8a – 5p) consider it a perk, but do not come to expect it.
- Do not expect email replies over the weekend or on holidays.
- Unexcused absences/missed classes are exactly that, missed. As a student, do not send emails asking me to summarize what you missed. In most cases it was several hours worth of content. Instead, ask a fellow student or ask me in person after you have:
 1. visited BBLEARN.
 2. referred to the syllabus schedule.
 3. consulted a classmate.
 4. consulted your TA.

Classroom Etiquette

In general, be respectful of your Instructor, TAs and your fellow students. Here are some pointers on appropriate conduct.

- Lateness to lecture is frowned upon as it is disruptive. If you have a reason that you cannot make it to class on time, please contact the instructor.
- Please set your phone to silent, or turn it off prior to lecture or lab. Cell phone use during lectures, labs and recitation is not allowed as it is disruptive to learning.
 - If you distract me while lecturing I will ask you to leave as you are indicating that something more pressing has your attention, in such cases you should attend to that.
- You may use a computer during class; I expect that you will use your computer for course related activities. If you are caught using your computer in an unacceptable manner (checking email, web surfing, and watching YouTube for example), I will ask you to leave the class.

- Participating in interactive class discussions is encouraged; however, at all other times, please do not talk, as this is disruptive to the instructor and your fellow students.
- It is expected that you will communicate respectfully with your peers and your instructors.
 - **If you disrupt class the following courses of action will be taken:**
 - i. **you will be asked to cease your disruptive behavior**
 - ii. **you will be asked to leave the classroom and be reported to the Office of Student Conduct**
 - iii. **you will be asked to withdraw or will be removed from the course.**
- If you disrupt an exam you will be removed from the exam and receive a zero (F) on the exam.

Grading Policies & Practices

- Assignments will be submitted via BBLEARN, unless otherwise stated.
- Email submissions are in no way acceptable, even late assignments must be submitted via BBLEARN. BBLEARN is a great resource which will prevent 'emails from not being received', you and the professor can both see when BBLEARN has successfully received your submission.
- **Late submissions will receive a 2% point deduction per day late. Deductions include weekend days and holidays.**
- The professor will make every attempt to return any submitted assignment within one weeks time. In some circumstances this cannot be met, I will apologize in advance and continue to do my best!
- Exams will be returned to students in class within one week. Exam grades will not be posted to BBLEARN until students return the graded exam to the instructor (for securities sake).

Finally, I am looking forward to interacting with you and creating a positive learning environment in lecture, lab, and beyond. I hope we have a productive and successful quarter together!

TENTATIVE COURSE SCHEDULE
(SCHEDULE IS SUBJECT TO CHANGE)

WEEK	TOPIC	READING	RECITATION
1 - Apr 2, 4, 6	Introduction to Evolution Early beliefs about time and life. History of evolutionary thought	Futuyma Ch. 1	Introduction to recitation, Q&A
2 – Apr 9, 11, 13	Phylogeny – the tree of life; taxonomy, systematics, and classification Patterns of evolution	Futuyma Ch. 2 Futuyma Ch. 3	Review of systematic and taxonomic concepts
3 – Apr 16, 18, 20	Patterns of evolution (continued) Evolution in the fossil record	Futuyma Ch. 3 Futuyma Ch. 4	Creating phylogenies using a cladistic approach
4 – Apr 23, 25, 27	Exam 1 (Apr 23) History of life on Earth – Archaean and Proterozoic Eons	Futuyma Ch. 5 p.102-108	Review of exam; early history of life on Earth
5 – Apr 30, May 2, 4	History of life on Earth – Paleozoic Era History of life on Earth – Mesozoic and Cenozoic Eras	Futuyma Ch. 5 p.108-115 Futuyma Ch. 5 p.115-131	Cambrian Explosion onward – review of history of multicellular life

6 – May 7, 9, 11	<p>The geography of evolution; Allopatric speciation; Vicariance</p> <p>The evolution of biodiversity</p>	<p>Futuyma Ch. 6</p> <p>Futuyma Ch. 7</p>	Biogeography, phylogeography, and demographics
7 – May 14, 16, 18	<p>Natural selection and adaptation</p> <p>Molecular evolution</p> <p>Evolution of development</p>	<p>Futuyma, Ch. 11</p> <p>Futuyma Ch. 20</p>	Hardy-Weinberg equation and population genetics
8 – May 21, 23, 25	<p>Exam 2 (May 21)</p> <p>Conflict and cooperation, Symbiosis and coevolution</p>	<p>Futuyma Ch. 20</p> <p>Futuyma Ch. 21</p>	Types of multigenic selection
9 – May 30, Jun 1	<p>Species concepts</p> <p>No Class May 28th – Enjoy ☺</p>	<p>Futuyma Ch. 16</p> <p>Futuyma Ch. 14, 15, & 19</p>	Pleiotropy, epistasis, and speciation
10– Jun 4, 6, 8	<p>Species concepts</p> <p>Fitness strategies</p> <p>Applied evolution</p>	Futuyma Ch. 17 & 18	Coevolution
11– Jun 11	Final Exam in Class		