This syllabus is subject to change. Please check back frequently for updates.
Last updated 9/28/15

BIOS E-18
Evolution

https://canvas.harvard.edu/courses/4246

Instructor
Maria Miara, PhD
mdeboef@oeb.harvard.edu
office hours: by appointment

Teaching Assistants
Distance Education Students: Do Dang, dodang@gmail.com
Classroom Students: John Lyons, john.lyons52@yahoo.com

Course Summary
Evolution is such a major tenet of modern biological theory that in 1973, evolutionary biologist Theodosius Dobzhansky penned that "nothing in biology makes sense except in the light of evolution." This course will provide a comprehensive introduction to evolutionary biology. Students will be introduced to both short-term and long-term evolutionary processes and will explore the patterns that result from those processes. Topics covered will include the history of evolutionary theory, evidence for evolution, the origin and history of life, genetic evolution, natural selection, sexual selection, species and speciation, human evolution and evolutionary issues in modern society. All students will be evaluated through assignments and two take home exams that will consist of problems and short essays. Graduate students will complete an additional term paper.

Learning Objectives
Students who successfully complete this course will be able to:

- Explain the importance of evolutionary processes to all biological fields and at all biological scales
- Understand the sources of genetic variation and the mechanisms by which this variation changes over time
- Deduce evolutionary relationships between taxa by reading or creating phylogenetic trees
- Draw a timeline of the history of life on Earth, indicating when major biological events occurred.
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Required Texts

All Students:


Graduate Students

Distance Education Students
Distance Education Students are encouraged to participate in lectures live by watching via the link available through the course website (see above). Students participating in this way are also encouraged to login to a chat room using the Blackboard Collaborate software. This chat room will be monitored by the distance education TA, who will ask questions and contribute to discussions on behalf of students not in the classroom. For those who are not able to participate live, videos of all lectures will be integrated with the associated slides and posted online within 24 hours.

Academic Honesty
You are responsible for understanding Harvard Extension School policies on academic integrity ([www.extension.harvard.edu/resources-policies/student-conduct/academic-integrity](http://www.extension.harvard.edu/resources-policies/student-conduct/academic-integrity)) and how to use sources responsibly. Not knowing the rules, misunderstanding the rules, running out of time, submitting "the wrong draft", or being overwhelmed with multiple demands are not acceptable excuses. There are no excuses for failure to uphold academic integrity. To support your learning about academic citation rules, please visit the Harvard Extension School Tips to Avoid Plagiarism ([www.extension.harvard.edu/resources-policies/resources/tips-avoid-plagiarism](http://www.extension.harvard.edu/resources-policies/resources/tips-avoid-plagiarism)), where you'll find links to the Harvard Guide to Using Sources and two, free, online 15-minute tutorials to test your knowledge of academic citation policy. The tutorials are anonymous open-learning tools.

Disabilities
The Extension School is committed to providing an accessible academic community. The Disability Services Office offers a variety of accommodations and services to students with documented disabilities. Please visit [www.extension.harvard.edu/resources-policies/resources/disability-services-accessibility](http://www.extension.harvard.edu/resources-policies/resources/disability-services-accessibility) for more information.

If you are a student with a disability that has been documented by the disabilities office and if you wish to request a reasonable accommodation for this class, please see me immediately. Please keep in mind that reasonable accommodations are not provided retroactively.
Course Policies

1. Students should attend or view all lectures.
2. Students are expected to be aware of all announcements made in class and all material on the course website.
3. Students attending lecture should arrive on time and be prepared.
4. Weekly Responses are due at 11:59pm EST the days before each lecture according to the schedule below. These are not accepted late.
5. Assignments are due at 11:59pm EST on the dates indicated below. Late assignments will lose 10% for each day past the due date.
6. Students should regularly check the course website for handouts, course information and any changes to the syllabus.
7. The Instructor and TAs will respond to e-mail within 24 hours barring extenuating circumstances.

Evaluation

Undergraduate Students:
30% - Assignments (6% each)
10% - Weekly Responses (submitted using online form, due each Sunday 11:59pm EST starting Sept 13 and ending Dec 13)
30% - Exam 1: Take-Home, Lectures 1 through 7
30% - Exam 2: Take-Home, Lectures 8 through 13

Graduate Students:
20% - Assignments (4% each)
10% - Weekly Responses (submitted using online form, due each Sunday 11:59pm EST starting Sept 13 and ending Dec 13)
20% - Exam 1: Take-Home, Lectures 1 through 7, selection of readings from Losos 2011
20% - Exam 2: Take-Home, Lectures 8 through 13, selection of readings from Losos 2011
30% - Term Paper, see term paper handout on course website
**Schedule:**

<table>
<thead>
<tr>
<th>Lecture Date</th>
<th>Lecture Topic</th>
<th>Reading</th>
<th>Assignments Due (All Students)</th>
<th>Assignments Due (Graduate Students Only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 31, 2015</td>
<td>Evolution as a Theory</td>
<td>Chapter 1</td>
<td></td>
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</tr>
<tr>
<td>September 14, 2015</td>
<td>Darwin and Natural Selection I</td>
<td>Chapter 2</td>
<td>Weekly Response*</td>
<td></td>
</tr>
<tr>
<td>September 21, 2015</td>
<td>The History of Life</td>
<td>Chapter 3</td>
<td>Weekly Response*</td>
<td>Topics Due: See term paper handout</td>
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<tr>
<td>September 28, 2015</td>
<td>Genes and Heritability</td>
<td>Chapter 5</td>
<td>Weekly Response*</td>
<td></td>
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<tr>
<td>October 5, 2015</td>
<td>Phylogenetics: Mapping Evolution</td>
<td>Chapters 4 and 9</td>
<td>Weekly Response*</td>
<td></td>
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<tr>
<td>October 19, 2015</td>
<td>Adaptation</td>
<td>Chapter 10</td>
<td>Weekly Response*</td>
<td>Assignment 1 Due</td>
</tr>
<tr>
<td>October 26, 2015</td>
<td>Natural Selection II and Coevolution</td>
<td>Chapters 8 and 15</td>
<td>Weekly Response*</td>
<td>Outline Due: See term paper handout</td>
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<tr>
<td>November 2, 2015</td>
<td>Exam 1 Help Session</td>
<td></td>
<td></td>
<td>Schedule meeting with Prof. Miara</td>
</tr>
<tr>
<td>November 9, 2015</td>
<td>Quantifying Evolution 1</td>
<td>Chapters 6 and 7</td>
<td>Weekly Response*</td>
<td>Assignment 2 Due</td>
</tr>
<tr>
<td>November 16, 2015</td>
<td>Quantifying Evolution 2</td>
<td>Chapters 6 and 7</td>
<td>Weekly Response*</td>
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<tr>
<td>November 23, 2015</td>
<td>Sexual Selection and Life History</td>
<td>Chapters 11 and 12</td>
<td>Weekly Response*</td>
<td>Assignment 3 Due</td>
</tr>
<tr>
<td>November 30, 2015</td>
<td>Species Concepts and Macroevolution</td>
<td>Chapters 13 and 14</td>
<td>Weekly Response*</td>
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<tr>
<td>December 7, 2015</td>
<td>Behavioral Evolution</td>
<td>Chapter 16</td>
<td>Weekly Response*</td>
<td></td>
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<tr>
<td>December 14, 2015</td>
<td>Human Evolution</td>
<td>Chapter 17</td>
<td>Weekly Response*</td>
<td>Assignment 4 Due</td>
</tr>
<tr>
<td>December 21, 2015</td>
<td>Exam 2 Help Session</td>
<td></td>
<td>Assignment 5 Due**</td>
<td>Term Paper Due</td>
</tr>
</tbody>
</table>

* Weekly Responses due Sunday 11:59pm each week starting September 13 and ending December 13

** Assignment 5 relates specifically to the reading of “The Beak of the Finch” and may be submitted any point throughout the semester.