

## EVOLUTION - BIOL 3010 - SPRING 2017

*Origins & evidence for biological evolution, & its significance for science & society*

MWF 2:30-3:20 pm, Biology/Natural Resources room 314

**Professor:** Dr. Carol von Dohlen; Office - BNR 237; (435) 797-2549;  
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**Why would you want to study evolution?** *"Nothing in biology makes sense except in the light of evolution"*—T. Dobzhansky, 1973. Evolution is a fascinating, wide-ranging, and unifying science that helps us understand the "why" in biology. Evolution helps us understand why we share genes with bacteria, sponges, and chickens; why pesticides and antibiotics become ineffective; why we have new flu vaccines every year; why there are millions of insect species and only 7 great ape species; why humans have wisdom teeth, an appendix, and lower back pain; why rodents make good models for studying human disease—and why we have sex!

Essential Learning Objectives (IDEA Center)	Course Objectives & Outcomes
Gaining factual knowledge (terminology, classifications, methods, trends)	You will learn and recall basic biological facts, vocabulary, and history important for studying evolution
Learning fundamental principles, generalizations, or theories	You will understand the process of evolutionary change on short-term and long-term time-scales; you will learn evolutionary concepts and comprehend the unifying role of evolution in all biology
Learning to apply course materials (to improve rational thinking, problem solving and decisions)	You will be able to use scientific reasoning skills, such as when we work through class exercises, to understand evolution as a science

**Course Format** - During class you will listen to lectures, view video clips, engage in discussion, and participate in class exercises. Outside of class you will read the textbook, watch films/online lectures, and take online quizzes to assist learning and prepare you to understand the concepts we explore during class.

### Course Resources

**Canvas:** You will use our Canvas site to receive important course announcements, download class materials, take quizzes and exams, and view grades. ***Sign up for push notifications of announcements as soon as possible.***

### *Textbook (required)*

Zimmer, Carl. 2014. *The Tangled Bank, An Introduction to Evolution*, 2<sup>nd</sup> Ed., Roberts & Co. ISBN 1936221446. At USU Bookstore; Amazon.com; VitalSource.com "eTextbook".

## Tentative Schedule

Date	Topic	Zimmer Chapter
M Jan 9	Introduction; Discussion - What is evolution? ( <i>pre-course survey</i> )	
W Jan 11	Walking Whales: An Introduction to Evolution	1 (quiz)
F Jan 13	Walking Whales: An Introduction to Evolution	1
M Jan 16	Martin Luther King, Jr. Day – no class	
W Jan 18	Before and After Darwin: A Brief History of Evolutionary Biology	2 (quiz)
F Jan 20	Before and After Darwin: A Brief History of Evolutionary Biology	2
M Jan 23	What the Rocks Say: How Geology and Paleontology Reveal the History of Life	3 (quiz)
W Jan 25	<i>Online HHMI lecture &amp; Quiz: "Changing Planet – Past, Present, and Future" - Dr. Andrew Knoll</i>	3
F Jan 27	<i>Film &amp; Quiz: "Charles Darwin and the Tree of Life"</i>	
M Jan 30	The Tree of Life: How Biologists Use Phylogeny to Reconstruct the Deep Past	4 (quiz)
W Feb 1	The Tree of Life: How Biologists Use Phylogeny to Reconstruct the Deep Past	4
F Feb 3	<i>Film &amp; Quiz: "Your Inner Fish"</i>	
M Feb 6	*** Exam 1 ***	
W Feb 8	Evolution's Raw Materials; <i>Extra Credit Opp: "DNA – Secret of Photo 51"</i>	5 (quiz)
F Feb 10	Evolution's Raw Materials	5
M Feb 13	The Ways of Change: Drift, and Selection	6 (quiz)
W Feb 15	The Ways of Change: Drift, and Selection	6
F Feb 17	<i>Film &amp; Quiz: HHMI Selected short videos</i>	
M Feb 20	Presidents Day – no class (class meets Tues)	
Tu Feb 21	Molecular Evolution: The History in Our Genes	7 (quiz)
W Feb 22	Molecular Evolution: The History in Our Genes	7
F Feb 24	<i>Online HHMI Lecture &amp; Quiz: "Genetics of Human Origins and Adaptation" – Dr. Sarah Tishkoff</i>	
M Feb 27	Adaptation: The Birth of the New	8 (quiz)
W Mar 1	***Exam 2***	
F Mar 3	<i>Film &amp; Quiz: Selected short videos on development</i>	8
Mar 6-10	USU Spring Break! Daylight Saving Sunday 12 <sup>th</sup> ! Turn clocks forward	

M Mar 13	Sex and Family	9 (quiz)
W Mar 15	Sex and Family	9
F Mar 17	<i>Film &amp; Quiz: PBS Evolution - "Why Sex?"</i>	
M Mar 20	Darwin's First Question: The Origin of Species	10 (quiz)
W Mar 22	Darwin's First Question: The Origin of Species	10
F Mar 24	<i>Film &amp; Quiz: HHMI "Beak of the Finch"; "Lizards Evolution"</i>	
M Mar 27	Macroevolution: Life Over the Long Run	11 (quiz)
W Mar 29	Macroevolution: Life Over the Long Run	11
F Mar 31	Intimate Partnerships: How Species Adapt to Each Other	12 (quiz)
M Apr 3	<i>Films &amp; Quiz: iBiology "Host-microbial symbiosis" - Dr. M. McFall-Ngai</i>	12
W Apr 5	***Exam 3***	
F Apr 7	<i>Film &amp; Quiz: "CrashCourse #25 Behavior"; "Your Inner Reptile"</i>	
M Apr 10	Minds and Microbes: The Evolution of Behavior	13 (quiz)
W Apr 12	Minds and Microbes: The Evolution of Behavior	13
F Apr 14	<i>Online HHMI Lecture &amp; Quiz: "Stone Tools and Human Behavior" - Dr. John Shea</i>	
M Apr 17	A New Kind of Ape	14 (quiz)
W Apr 19	A New Kind of Ape	14
F Apr 21	<i>Online HHMI Lecture &amp; Quiz: - "Hominid Paleobiology" - Dr. Tim White</i>	
M Apr 25	<i>Film &amp; Quiz: Nova - "Becoming Human Pt.3 Last Human Standing"</i>	15 (quiz)
W Apr 27	Evolutionary Medicine	15
F Apr 29	<i>Film &amp; Quiz: "Your Inner Monkey"</i>	
M May 1	Exam 4 (50 min format, on material since Exam 3) & post-course survey: 1:30 - 3:20 pm	

### Assignments:

- **Pre-course survey:** this quiz helps me understand your incoming background knowledge, so I can adjust my teaching to emphasize topics and concepts that are least-well understood. It is **graded on participation only, not on how you answer**.
- **Textbook chapters:** you will have reading assignments to learn basic facts and concepts, so we can explore concepts, questions, and scientific analyses more deeply during class time. Note that **Zimmer** is NOT your standard textbook. It is enjoyable to read. It does not hand feed you all the relevant terms and their definitions in bold italics, etc. You have to do much of this work yourself. But which way do you think contributes best to learning and retention of the material?

- ***In-class exercises:*** during class periods, I may ask one or more practice or discussion questions, or present problem sets. You will usually work in pairs or groups of 4 to answer these. Of course, you must be present in class to receive credit for these exercises.
- ***Quizzes:*** outside of class you will take an online quiz every week (in Canvas) on the chapter reading. The quiz is **open book** and **due by 2:30 pm** before the first class period on that chapter. This is to ensure that you have the background information to get the most out of class time. You will also take quizzes on the assigned films and online lectures.
- ***Exams:*** The in-class practice questions and reading quizzes will help you prepare for exams, but exams will emphasize what we cover in class. You will use both simple fact recall and higher-level scientific reasoning skills on exams. We will not meet in class on exam days; you will take exams on Canvas for 50 minutes during the regular class time, 2:30-3:20 pm. ***Exams are closed-book and on your own.*** *Absences demanded by university-related activities, travel for interviews, for medical and family emergencies can be accommodated, given documentation & advance notice.*
- ***Post-course survey:*** this survey helps me assess how effective my teaching has been, and what I need to change for the future.

**Grading:** Your grade will be based on performance on the assignments, weighted as follows:

Pre/post-course survey	5%
In-class exercises	10%
Quizzes	25%
Exams (4 @ 15%)	60%

Grade assignments are according to the USU standard: A (93-100%), A- (90-92.9%), B+ (87-89.9%), B (83-86.9%), B- (80-82.9%), C+ (77-79.9%), C (73-76.9%), C- (70-72.9%), D+ (67-69.9%), D (60-66.9%), and F (below 60%).

## University Policies

### ***The Honor System & Plagiarism:***

[www.usu.edu/student-services/student-code/article6.cfm](http://www.usu.edu/student-services/student-code/article6.cfm). To enhance the learning environment at Utah State University and to develop student academic integrity, each student agrees to the following Honor Pledge: ***"I pledge, on my honor, to conduct myself with the foremost level of academic integrity."*** Students have a responsibility to promote academic integrity at the University by not participating in or facilitating others' participation in any act of academic dishonesty and by reporting all violations or suspected violations of the Academic Integrity Standard to their instructors. Violations of the Academic Integrity Standard (academic violations) include but are not limited to: cheating, falsification, plagiarism.

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