

# BIOS 3600 Evolutionary Biology /BIOL 6600 Evolution

Fall 2026, 3 credits

Monday & Wednesday, 3:00-3:15 pm

Location: Ford ES&T L1255

## Instructors

Dr. **Sean Anderson**

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Office hours: by appointment



## Teaching Assistants: TBD

## Overview

Evolutionary Biology is an active-learning class where you will gain a comprehensive overview of evolutionary biology, including processes (e.g., natural selection, genetic drift) and resulting patterns (e.g., genome organization, phylogeny, and the fossil record). The course includes lecture, in-class activities, and readings. By the end of this course, you will develop skills and knowledge that should allow you to:

- 1) Explain how evolution is the organizing principle for Biology, using specific cases and examples
- 2) Deconstruct and respond to evolutionary misconceptions
- 3) Understand the meaning of evolutionary relatedness
- 4) Form hypotheses about how phenotypes and traits evolve
- 5) Interpret data that address evolutionary questions
- 6) Apply mathematical equations from basic evolutionary theory to test hypotheses
- 7) View the world through a new lens. "Nothing in biology makes sense except in the light of evolution!"- Theodosius Dobzhansky

## Prerequisites

Ecology (BIOS 2300 or BIOS 2310) or Genetics (BIOS 2600 or BIOS 2610) or the equivalent (e.g. BIOL 2335). If neither of these classes have previously been taken, permission to take BIOS 3600/BIOL 6600 must be obtained from the course instructors.

## Reading Materials

Required: readings provided on Canvas, which will include primary literature and a wide variety of online materials (e.g., blogs, reports, news media, video documentaries, podcasts).

Optional: Although the textbooks listed below are optional, we each found having a textbook very helpful as a reference when first learning this content. We encourage you to borrow/rent/purchase one of them and use it as a resource for this class.

- *Evolution*: by Douglas Futuyma and Mark Kirkpatrick
- *Evolution: Making Sense of Life* by Douglas Emlen and Carl Zimmer
- *Evolution* by Carl Bergstrom and Lee Dugatkin
- *Evolutionary Analysis* by Jon Herron and Scott Freeman

### **Course Expectations, Activities, and Assignments**

*Participation*: Class meetings will include mini-lectures, discussions, and multimedia presentations. Your preparation and willing participation are a key component of a productive and fun environment. PowerPoint slides of lecture materials will be made available on Canvas after each class. Note that classes will not be recorded.

*Restrictions on redistribution of class materials*: Materials posted on Canvas are for the sole purpose of educating the students currently enrolled in the course. Posting of course materials to websites like Chegg and Course Hero is a violation of copyright law as well as of Georgia Tech's academic honor code. **Any such actions will result in a failing grade.**

*Electronic devices*: Please show your respect for the course instructors and classmates by not using electronic devices for non-class purposes.

*Exams*: There will be three in-person exams which **are closed book**. You are allowed, but not required, to bring a single sheet of 8.5x11 paper listing whatever material you like to include. This sheet of paper needs to be your own work and will be collected with your exam. The material in the course is cumulative; while exams 2 and 3 will focus on the material taught in units 2 and 3, respectively, you may need to draw on concepts learned earlier in the course to craft a complete and thoughtful answer to broader synthesis questions.

*Missed exams (make-up policy)*: If you are sick and unable to take an exam, or have an otherwise excused absence, please let the course instructors know as soon as possible. Make-up exams will ideally be given within one week of the scheduled exam date. **Students should request an official notice from the Dean of Students office, when applicable, and provide medical documentation to the absence verification form here:**

[https://cm.maxient.com/reportingform.php?GeorgiaTech=&layout\\_id=5](https://cm.maxient.com/reportingform.php?GeorgiaTech=&layout_id=5). Please do not send medical documentation to your instructors. All other requests for makeup exams are at the discretion of the instructors. Make-up exams are likely to be different from the original exam and may take the format of an oral exam. Under extenuating circumstances, we will remove the missed exam from your grade calculation by using the weighted average of your other exam scores as your grade for the missed exam.

Regrading requests: Exams will be graded and returned using Gradescope in Canvas. Any regrade requests must be made within one week of the exam release and through the Gradescope platform.

*Evolutionary Synthesis:* Students enrolled in BIOL 6600 will complete a graduate-level, written integrative Evolutionary Synthesis Assignment. Details are on Canvas. This project-based assignment will have three internal deadlines that are not flexible. Please work ahead of deadline to stay on task for this assignment. See the assignment for details. **No use of LLMs are permitted for the Evolutionary Synthesis assignment.**

*Class activities:* We will use digital and paper tools to engage you in discussion of the topics during class. In-class activities are graded on participation rather than accuracy. To earn credit for these assignments, you must be present in class. You are expected to attend class unless you have a compelling reason not to do so. Institute approved activities or extended illness may be accommodated with asynchronous submission of classwork. The lowest three activity scores will be dropped.

*Weekly homework:* These short assignments will be in Canvas and designed to help you review the material across class days/weeks. Homework is due every Friday at 5:00 ET on Canvas. Late penalty: 10% per day.

*AI Policy:* All work submitted should be of your own thinking, unless proper citation is given to the human(s) who created it. LLMs have limited role in advanced academic concepts and your work. Be skeptical of all output generated by LLMs. **LLMs fabricate content**, and all material you rely on should be fully vetted. Currently, GT only approves the use of LLM Microsoft Co-pilot (see approvals here <https://oit.gatech.edu/ai/guidance> ). **NO LLMS are permitted for the Evolutionary Synthesis assignment.**

<i>Grading:</i>	<b>Course Assessment</b>	<b>BIOS 3600</b>	<b>BIOL 6600</b>
	Participation/Class Activities	20%	15%
	Weekly homework	20%	20%
	Exam 1	20%	15%
	Exam 2	20%	15%
	Exam 3	20%	20%
	Evolutionary Synthesis	0%	15%

A = 100-89.5%, B = 89.4-79.5%, C = 79.4-69.5%, D = 69.4-59.5%, F = 59.4-0%

## Honor Code and Code of Conduct

All students are expected to abide by the Academic Honor Code, <https://policylibrary.gatech.edu/student-life/academic-honor-code> and Code of Conduct, <https://policylibrary.gatech.edu/student-life/student-code-conduct>. Some specific examples of Honor Code violations that we've encountered include: falsifying attendance, copying during quizzes/exams, incorrect citations or lack of citations in writing, violations of the AI policy, or submitting another's work as your own. Students found in violation of the Honor Code will be reported to the Office of Student Integrity.

## Accommodations

Please contact us during the first week of class or as soon as possible if you need classroom accommodations. Accommodations should be arranged in advance and in accordance with the Office of Disability Services (<http://disabilityservices.gatech.edu/>). Tests scheduled at the testing center need to be done according to their stated guidelines; accommodations for extended time will not be offered outside of the testing center.

## Statement of Intent for Inclusivity

As members of the Georgia Tech community, we are committed to creating a learning environment in which all our students feel safe and included. Because we are individuals with varying needs, we are reliant on your feedback to achieve this goal. To that end, we invite you to enter a dialogue with us about the things we can stop, start, and continue doing to make our classroom an environment in which every student and instructor feels valued and can engage actively in our learning community.

## Schedule for Evolutionary Biology (Spring 2026)

Note that this syllabus (and schedule) is subject to change. Any updates will be uploaded to Canvas. *Optional readings are chapter references from Herron and Freeman (5e), or you can look up these topics in any of the optional reading textbooks*

Spring 2026	Topic	Instructor	Readings / Assignments	Optional readings
24-Aug	C01 Introduction	TBD	<a href="#">Misconceptions</a> <a href="#">C01MisconceptionActvty</a>	3.5
26-Aug	C02 History of evolutionary thinking	TBD	optional readings: History <a href="#">1</a> or <a href="#">2</a> No Activity Key for today <a href="#">Homework 1 KEY</a>	3.7
31-Aug	C03 History of life (paleontology)	TBD	optional readings: Overview <a href="#">1</a> or <a href="#">2</a> <a href="#">C03 Activity KEY</a>	18.1-3
2-Sep	C04 Mutation and genetic variation	TBD	<a href="#">LectureSummary</a> , <a href="#">C04_activityKEY</a> <a href="#">HW2KEY</a>	<a href="#">1</a> , <a href="#">2</a> , <a href="#">3</a>
7-Sep	Holiday (Labor Day)	TBD		
9-Sep	C05 Natural Selection	TBD	<a href="#">LectureSummary</a> , <a href="#">C05_activityKEY</a>	
14-Sep	<b>C06 Phylogeny 1: Reading a tree</b> <b>END OF EXAM 1 MATERIAL</b>	TBD	<a href="#">Tree misinterpretations</a> (and its 4 subpages) <a href="#">C06 Activity KEY</a> <a href="#">Homework 3 KEY</a>	4.1-2
16-Sep	BEGINNING OF EXAM 2 MATERIAL	TBD	<a href="#">How to build a tree</a> (and its 10 subpages) <a href="#">C07 Activity KEY</a>	

	C07 Phylogeny 2: Building a tree			
21-Sep	Exam 1	--	-	
23-Sep	C08 Studying adaptation	TBD	<a href="#">LectureSummary</a> , <a href="#">C08ActivityKEY</a>	1 <a href="#">Critique of adaptationist programme</a> 2 <a href="#">giraffe-s-neck</a>
28-Sep	C09 Adaptations	TBD	No Activity Key for today <a href="#">HW04_KEY</a>	<a href="#">Wooldridge et al 2022</a> , 7.3, 9.1, 9.3, 9.6
30-Sep	C10 Population genetics 1: Hardy-Weinberg, Selection	TBD	<a href="#">LectureSummary</a> , <a href="#">Activity10KEY</a> ,	<a href="#">A brief history</a>
5-Oct	C11 Population genetics 2: Drift, Selection+Drift	TBD	<a href="#">LectureSummary</a> , <a href="#">Activity11KEY</a> , <a href="#">HW05_KEY</a>	<a href="#">Pop-gen</a> , <a href="#">sampling error</a>
7-Oct	C12 Speciation 1: What are species?	TBD	<a href="#">LectureSummary</a> , <a href="#">Activity12KEY</a> ,	<a href="#">DefiningSpecies</a> , <a href="#">Genetics of RI</a>
12-Oct	C13 Speciation 2: Causes of speciation	TBD	<a href="#">LectureSummary</a> , <a href="#">Activity13KEY</a> <a href="#">HW06KEY</a>	Reinforcement: <a href="#">Explained</a> + <a href="#">Research</a>
14-Oct	C14 Evolution of Sex	TBD	<a href="#">Otto 2008</a> <a href="#">Nielson 2006</a> <a href="#">Activity_C14KEY</a>	
19-Oct	C15 Sexual selection <b>END OF EXAM 2 MATERIAL</b>	TBD	<a href="#">LectureSummary</a> , <a href="#">Activity_C15KEY</a> , <a href="#">HW07KEY</a>	<a href="#">Intro</a> , <a href="#">ButWhatistheOriginofFemaleChoice?</a>
21-Oct	BEGINNING OF EXAM 3 MATERIAL C16 Coevolutionary patterns	TBD	Brodie 2011 (on Canvas)	
26-Oct	Exam 2	--		
28-Oct	C17 The Evolution of Sociality	TBD		
2-Nov	C18 Evolutionary genetics	TBD		
4-Nov	C19 Genome Evolution	TBD		
9-Nov	C20 Evolutionary constraints & trade-offs	TBD		
11-Nov	C21 Life history evolution & aging	TBD		13
16-Nov	C22 Evolutionary development	TBD		15
21-Nov	C23 Major transitions in evolution	TBD		19
23-Nov	C24 Evolutionary medicine	TBD		14
28-Nov	C25 Human evolution	TBD		20
30-Nov	TBD			
5-Dec	TBD			
7-Dec	TBD			
12-Dec	TBD			
14-Dec	TBD			
TBD	EXAM 3 (2 hours) TIME TBD		-	