



Spring 2014: Mondays 10:15am – 12:05pm (Fox Hall, Room 204)

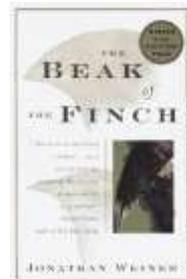
<http://theantlife.com/teaching/bio295-islands-evolution>

Evolution & Evolutionary Ecology in an applied context. – We will explore the mechanisms and basic principles of evolution in the context of islands and island-like situations (e.g., cities, trees, mountains, water bodies, human bodies).

Islands and evolution are tightly linked. In this class we will explore why that is and what makes islands so special when it comes to evolution. Both Charles Darwin and Alfred Russel Wallace were inspired by islands when they formulated their ideas on natural selection. We will revisit the roots of evolutionary theory by going back to the very beginnings: Darwin and the Galapagos Islands. However, we will refer to more recent work done by Peter and Rosemary Grant (Princeton University) on Darwin’s finches. The Grants have been studying these finches for 40 (!) years and have accumulated an unprecedented data set that allowed them to reconstruct the evolutionary history of these birds and to conduct pioneering work by documenting evolution in action.

In the book *The beak of the finch* Jonathan Weiner follows the career of Peter and Rosemary Grant closely as they succeed in proving Charles Darwin’s theory of evolution by natural selection. We will use this Pulitzer Prize-winning book as a guide through the class to help us understand how evolutionary change comes about and what mechanisms and processes are at work.

We will also explore the theory of island biogeography which seeks to explain the distribution of living organisms on islands. We will examine how isolated populations are often subject to unique evolutionary paths and the roles immigration and extinction play in which and how many species are ultimately found on an island.



CONTACT

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COURSE DESCRIPTION

COURSE RESOURCES

Course website: <http://theantlife.com/teaching/bio295-islands-evolution>

Grade book: <http://courses.ncsu.edu/bio295/lec/002/>

Book (required): Weiner, Jonathan (1995): *The Beak of the Finch: A Story of Evolution in Our Time*, ISBN-10: 067973337X, ISBN-13: 978-0679733379

Reference textbooks (not required): Freeman, Scott & Herron, Jon C. (2007): *Evolutionary Analysis* (4th ed.), ISBN-10: 0132275848, ISBN-13: 978-0132275842; Futuyma, Douglas J. (2005): *Evolution* (2nd ed.), ISBN-10: 0878931872, ISBN-13: 978-0878931873

Course objectives

After this course students will be able to...

- To explain the diversity and complexity of nature, how it has evolved, and how it works as a system.
- To describe the driving forces of evolution and how they relate to islands and island-like situations.
- To discuss a variety of examples of evolution.
- To identify and explain the components of a scientific article.

Course material

I require everyone to have access to the book *The Beak of the Finch* (see “course resources” box above) throughout the semester. I will assign readings for each class period and give homework assignments that directly relate to this book. The textbooks *Evolutionary Analysis* and *Evolution* are not required but I recommend them. I will provide references to these books for each topic we treat so that you can read about it on your own time. All other course material, such as course guidelines and additional readings, will be posted on the course website. I will add material and update the website throughout the semester so it reflects what we are doing in class. **Please, make sure to check the website frequently!**

YOUR FINAL GRADE

30 %
PARTICIPATION

30 %
HOMEWORK
& QUIZZES

20 %
INDEPENDENT
PROJECT

20 %
FINAL EXAM

Participation (30 %)

Your participation grade consists of 4 pieces: **attendance, participation during class, in-class exercises and minute papers.**

Attendance

There will be **3 attendance points per class**, one for being there on time, one for being there in the middle, one for being there at the end. If you know in advance that you will miss a class, please notify me as soon as possible. I will distinguish between an **excused** and an **unexcused** absence. An excused absence is a personal illness and an emergency situation (e.g., death in the family, your apartment being on fire, see REG 02.20.03, <http://policies.ncsu.edu/regulation/reg-02-20-03>). I require appropriate documentation for such an absence. Everything else counts as an unexcused absence (e.g., weddings, birthday parties, family reunions, job/school interviews). **You will lose attendance points for unexcused absences and there is no way to make up for class participation and in-class exercises.** In the case of an excused absence, we will discuss an appropriate make-up assignment. If you miss $\frac{1}{4}$ of the entire course (i.e. more than 3 classes) you will not pass this course.

Participation during class

This class is designed to be interactive. Therefore, I consider participation an important part of your learning experience. You will earn **full credit if you are paying attention and focusing on class activities** (and not doing something else like sleeping, playing with your phone, chatting with your neighbor or disrupting class otherwise).

In-Class exercises

In-class exercises are designed to give you the opportunity to actively work on problems related to topics we cover in class. The assignments will differ in scale and scope each week. You will earn **full credit if you take an active part in the process and fulfill the requirements of the exercise.**

Minute papers

At the end of each class period, I will give everyone a few minutes to reflect and write down what you learned in class. I will then ask 2-3 students to share their notes with the class. Minute papers are designed to give YOU the opportunity to summarize in your words (and to your class mates) what you learned and will give ME the opportunity to see how well you understood the material we covered in class. Minute papers will earn **full credit if they are formulated thoughtfully and relate to topics covered in class.**

My philosophy on grades:

It is my goal to create a positive and supportive learning environment. I use grades to help you measure your progress in class. Grades allow you to self-evaluate the expectations you have set for yourself. If you feel that your grades are not reflecting these expectations, come see me and we will try to find the source of the problem.

Homework & Quizzes (30 %)

There will be **six homework assignments** throughout the semester. These assignments will relate to readings from *The beak of the finch* and are designed to help you reflect on what you have read in the book. There will also be **two quizzes** (see course calendar). These quizzes will consist of multiple choice questions and questions that require short written answers. The quizzes are designed to help you reflect on the material we cover in class.

Independent project (20 %)

The independent project will give you the opportunity to focus on one subject in greater depth than covered in class and put your personal spin on it. Your project will be presented as a **short movie** (5-10 minutes) and will cover a topic you can choose from a list I will provide in the beginning of the semester. You will be asked to include **one case study from the primary literature**. The movie should fall into the category “educational” but I will leave the implementation of these directions entirely up to you!

Before spring break I will ask you to submit a script including a rationale for your project. Over spring break I will provide you with feedback on this script which you are expected to implement for the final submission. The final script and the movie will be due at the end of the course (before your final exam). We will do movie showings on the last day of class which will also serve as a review of class topics to prepare you for the final exam. You will be graded on content (accuracy and scope), presentation and creativity. More detailed information on the project will be posted on the course website.

Final exam (20 %)

The final exam is designed to give you the opportunity to integrate everything you learned throughout the semester so you can generate a coherent picture when thinking about evolutionary questions (and their relation to islands and island-like situation). The exam will cover both **theory and case studies** and will consist of open questions and multiple choice questions.

Extra credit

If you are interested in earning extra credit points in this class, please see me at any point during the semester but no later than one week before the final exam (April 21st). I will provide the opportunity to submit an extra credit assignment for a total of 5 % of your final grade.

Grading scale

A+	100-97	B+	89-87	C+	79-77	D+	69-67	F	<60
A	96-93	B	86-83	C	76-73	D	66-63		
A-	92-90	B-	82-80	C-	72-70	D-	62-60		

Written assignments

I require a **header** in each written assignment. The header should look like this:

<i>Assignment title</i>	<i>Your name</i>
BIO 295	<i>Date</i>

All written assignments must be formatted as follows: **single-spaced, Times New Roman, 12pt, 1" margins, numbered pages**. If you have any questions about formatting, please ask me. For electronically submitted assignments, use your **name and course number for the file name**, for instance: **BIO295_Your Name_Assignment title**. The due dates for written assignments will be specified on the course website. I will NOT accept late submissions.

Emails

Make sure to include your full name in the body of all emails you send to me. In the **subject heading, please write: BIO 295** (and nothing else). If you are attaching a document, **include your name in the document and use your name and course number for the file name** (BIO295_Your Name_Assignment title). If you are replying to an email, please include any previous exchanges in the email reply. All emails should begin with a salutation and close with your name. If you have not received a reply, make sure you have the correct heading, as the filter will only collect those with "BIO 295".

Course evaluation

This class is about YOU. Therefore, I would like to get your feedback. I will provide several opportunities throughout the semester to voice your comments and I encourage you to be **frank and constructive**. As the semester progresses, please take notes of things that you particularly enjoyed as well as aspects that could be improved. I will give such suggestions careful consideration and although I might not always be able to implement them, **I am ready to consider making changes that help enhance your learning experience**. At the end of the semester I will ask you for more comprehensive feedback.

How to succeed in this class

- *Be on time*
- *Come prepared*
- *Actively participate*
- *Be diligent in your work*
- *Submit assignments on time*
- *Ask questions!*

You can expect me to be...

- Dedicated to teaching and to providing a quality academic experience
- Considerate of individual abilities and circumstances
- Committed to fostering a fun, safe, and challenging educational environment

I expect you to be...

- Interested in learning
- Actively participating in class
- Open to challenges presented to you
- Considerate of your classmates and your instructor by acting respectfully at all times

Accommodations

I encourage **STUDENTS WITH DISABILITIES**, including non-visible disabilities such as chronic diseases, learning disabilities, head injuries and attention deficit/hyperactive disorders, to **discuss appropriate accommodations** that might be **helpful** to them with me (after class or during office hours).

You must provide documentation of your disability from the NCSU Disability Student Services, 2000 Harris Hall, 515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation (REG 02.20.1) at <http://policies.ncsu.edu/regulation/reg-02-20-01> and Disability Services Office at <http://www.ncsu.edu/dso/>. **If you have a disability, don't wait until you struggle (or until a few days before the final exam) with reporting it!** I am bound by law to treat all students equally unless there is documentation of a disability.

Plagiarism policy

All course work submitted for a grade must be your own. University standards of academic integrity forbid either giving or receiving

*The Golden Rule for Avoiding Plagiarism:
Give credit where credit is due!*

unauthorized help on graded work. Violations of University standards will be prosecuted. You will need to sign the academic integrity statement on each written assignment. Please read the **Code of Student Conduct** (POL 11.35.01) found at <http://policies.ncsu.edu/policy/pol-11-35-01> and go to the **Office of Student Conduct** at: <http://studentconduct.ncsu.edu/>.

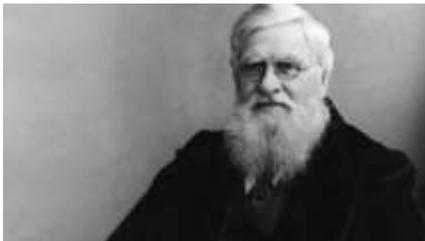
Non-discrimination policy

NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation (POL 04.25.05) are available online and may be accessed at <http://policies.ncsu.edu/policy/pol-04-25-05> and <http://oied.ncsu.edu/oied/policies.php>. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the **Office for Equal Opportunity** (OEO) at 919-515-9617.

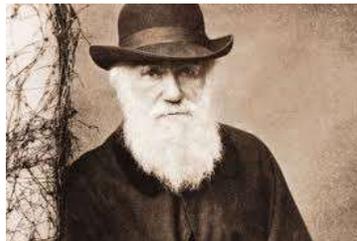
COURSE CALENDAR

Date	Topic*	
6-Jan	Why should we care about Evolution and Islands?	
13-Jan	Natural Selection and the History of Evolutionary Theory	
20-Jan	<i>NO CLASS: MARTIN LUTHER KING DAY</i>	
27-Jan	Variation	
3-Feb	Mechanisms of Evolution I	
10-Feb	Mechanisms of Evolution II	
17-Feb	Mechanisms of Evolution III	
24-Feb	Evolutionary Trees	QUIZ
3-Mar	Patterns of Evolution	
10-Mar	<i>NO CLASS: SPRINGBREAK</i>	
17-Mar	Species Concepts & Speciation	
24-Mar	Adaptation	
31-Mar	The Evolution of Biodiversity	
7-Apr	Life History Evolution	QUIZ
14-Apr	Island Biogeography	
21-Apr	TBA	
28-Apr	FINAL EXAM	EXAM

* Class topics are subject to change.



Alfred Russel Wallace



Charles Darwin



Peter and Rosemary Grant