



## Great Adventures in Evolution



### **MSCI-160, Great Adventures in Evolution**

Department of Mathematics and Science, School of Liberal Arts and Sciences

### **Course Description:**

Behind every evolutionary discovery there is a story. By exploring these stories and the discoveries they yielded, this course provides a solid foundation in evolutionary biology to students with minimal scientific background. Through weekly discussions we will illuminate what motivates the scientists who make great discoveries, how these discoveries are made, and where these discoveries fit into the development of evolutionary biology as a scientific field.

Upon completion, this course is worth one (1) credit.

**Meeting Time:** Tuesdays, 4:00 to 4:50 pm, Engineering 111

**Instructor:** Dr. Christopher Jensen  
Assistant Professor, Department of Math and Science  
<http://www.christopherxjensen.com/>  
**Office:** ARC Lower Level, Room G-49  
**Email:** [cjensen@pratt.edu](mailto:cjensen@pratt.edu)  
**Phone:** 718-636-3572, x3572 from the BK campus

**Office Hours:** Mondays 11:00 am to 12:30 pm, Wednesdays 12:30 to 2 pm, *or by appointment*

### **Course Goals:**

- To describe how various forms of evidence are used to inspire and support evolutionary hypotheses.
- To understand how the life experiences and aspirations of evolutionary biologists enabled them to make important discoveries.
- To explain the importance of these discoveries to the field of evolutionary biology.
- To recognize how the field of evolutionary biology and its modes of inquiry have changed over the past 150 years.

### **Learning Objectives:**

Students who successfully complete *Great Adventures in Evolution* will be able to...

- Provide an evolutionary explanation for observed biological phenomena.
- Discuss how and why particular scientists were able to make influential evolutionary discoveries.
- Explain how evidence is used to support or reject scientific hypotheses about how life evolved.
- Identify the common characteristics possessed by successful evolutionary biologists.
- Contextualize famous evolutionary discoveries in the overall history of evolutionary biology.
- Depict the importance of an evolutionary discovery through a creative medium.

## Assessment Criteria:

Below is a summary of how you will be graded in this course. All grades will be posted on the *LMS*, so please take advantage of the fact that you can always know how you are doing in the course.

Contribution to Grade	Category	Description
<b>25%</b>	<i>Reading Response</i>	During each week of class, I will post two reading response questions (RRQ's) on the <i>LMS</i> . These questions will help guide your reading and get you thinking about key issues that will be discussed in class. To receive credit, you must provide answers by 5:00 pm on the day before class. Because I need to read your answers before each class meeting, late <i>Reading Response Questions</i> will not be accepted (please do not email!).
<b>25%</b>	<i>Participation</i>	We'll be discussing course readings in light of our own particular concerns. I'll have questions for you; I will expect you to have questions for me. Come to class having read and thought about assigned readings, ready to actively engage in dialogue. To receive participation credit you need to be present in class; to receive full participation credit you need to be actively engaged in class discussions.
<b>50%</b>	<i>Final Project</i>	For your final project in this course, you will creatively depict the key ideas illuminated by one of the stories we read during the semester. You may use any creative media to create your depiction. A <i>Project Summary</i> submitted along with your project will allow you to explain how elements of your design relate to your chosen story. During the last few weeks of class, each student will present his or her project to the class.



***Under no circumstances will personalized extra-credit work be offered to any student***



### **Lateness and Absence:**

**Of Students:** I expect you to arrive to class on time. Lateness and absence can adversely affect your participation grade.

**Of Assignments:** Late assignments will be penalized by 10% per day. Late reading responses are not accepted.

**Excuses:** There are very few legitimate reasons to miss all or part of a class session or for submitting assignments after the stated deadlines. In order for an absence or lateness to be excused, you must provide formal documentation stating which classes/deadlines were affected and explaining the reason behind the absence; all documentation will be subject to strict verification. Valid excuses include family emergencies and personal health issues. The following reasons do not excuse lateness or absence: oversleeping, excessive work load in other classes, inability to use the *Learning Management System*, or "forgetting".

<b>Important Dates</b>	
Event	Date
<i>Final Project Proposal due</i>	Sunday, <b>November 11th @ 11:59 pm EST</b>
<i>Final Project due</i>	Sunday, <b>November 18th @ 11:59 pm EST</b>

## Weekly Units:

Week	Date	Major Topic(s)	Key Question(s)	Readings
1	Aug. 28th	<b>Introduction to Evolution</b>	What are the basic tenets of evolutionary theory? What distinguishes an evolutionary hypothesis from other kinds of explanations?	
2	Sept. 4th	<b>Charles Darwin: The Genesis of Evolutionary Theory</b>	What kinds of observations did Darwin make during his voyage on the <i>Beagle</i> ? How did Darwin's travels inform his later theories on biological evolution?	<b>Into the Jungle</b> Chapter 1 "Reverend Darwin's Detour"
3	Sept. 11th	<b>Alfred Russel Wallace: The Birth of Biogeography</b>	How did Wallace's collection voyages lead him to suggest that natural selection drives the evolutionary process? What is "Wallace's Line" and how did he come to discover it?	<b>Into the Jungle</b> Chapter 2 "Drawing the Line between Monkeys and Kangaroos"
4	Sept. 18th	<b>Henry Walter Bates: The Discovery of Mimicry</b>	How did Bates come to discover mimicry in nature? How is mimicry an adaptive trait?	<b>Into the Jungle</b> Chapter 3 "Life Imitates Life"
5	Sept. 25th	<b>Eugene DuBois: Search for the Missing Link</b>	Why was finding the remains of primitive humans important in the late nineteenth century? How does DuBois' "Java Man" fit into the evolutionary history of the human species?	<b>Into the Jungle</b> Chapter 4 "Java Man"
6	Oct. 2nd	<b>Roy Chapman Andrews: Fossil Hunter</b>	What made Andrews a successful fossil hunter? Why were the findings of the Andrews expedition critical to the field of paleontology?	<b>Into the Jungle</b> Chapter 5 "Where the Dragon Laid Her Eggs"
7	Oct. 9th	<b>Luis and Walter Alvarez: Explaining the End-Cretaceous Mass Extinction</b>	What observations led the Alvarezes to the unlikely conclusion that a meteorite impact accompanied the end-Cretaceous mass extinction? Why was the end-Cretaceous mass extinction important?	<b>Into the Jungle</b> Chapter 6 "The Day the Mesozoic Died"
8	Oct. 16th	<b>Majorie Courtenay-Latimer: Recognizing a Living Fossil</b>	What allowed Latimer to recognize that the coelacanth fossil was unusual? What makes the coelacanth an interesting species to evolutionary biologists?	<b>Into the Jungle</b> Chapter 7 "Miss Latimer's Extraordinary Fish"
9	Oct. 23rd	<b>Tony Allison: Diagnosing the Evolution of Disease</b>	How did Allison make the connection between sickle cell anemia and malaria? How does heterozygote advantage allow the sickle cell disease to persist in some populations?	<b>Into the Jungle</b> Chapter 8 "A Sickle-Cell Safari"
10	Oct. 30th	<b>Johan Ruud &amp; Arthur DeVries: Bloodless Fish Has Antifreeze in its Veins</b>	Why was the icefish considered an evolutionary anomaly? How can modern genetic techniques reveal evolutionary history?	<b>Into the Jungle</b> Chapter 9 "In Cold Blood: The Tale of the Icefish"
	Nov. 6th	<b><i>Election Day, No Class</i></b>		
11	Nov. 13th	<b>Final Project Workshop</b>	How can concept maps be used to organize ideas and incorporate those ideas into a creative project?	<b>Jensen</b> "Concept mapping as a creative tool"

Week	Date	Major Topic(s)	Key Question(s)	Readings
12	Nov. 20th	Final Project Presentations 1		Student Project Summaries (posted on the LMS)
13	Nov. 27th	Final Project Presentations 2		Student Project Summaries (posted on the LMS)
14	Dec. 4th	Final Project Presentations 3		Student Project Summaries (posted on the LMS)
15	Dec. 11th	Final Project Presentations 4		Student Project Summaries (posted on the LMS)

### **Learning Management System (LMS):**

During the course of the semester, we will make extensive use of Pratt's *Learning Management System (LMS)*. I recommend that you use the *Firefox* browser to access the *LMS* via this page: <http://lms.pratt.edu/> (I discourage you from using the *my.pratt.edu* entrance point, as it is not always working). Use your ONEKEY username and password to log in. I expect you to check the *LMS* several times a week for announcements, reading assignments, and updates to your class grade (note that you can also set the *LMS* to send you email messages every time our class page is updated). I will be using the *LMS* to send email announcements throughout the semester, so please make sure that you check the email address listed under your *LMS* profile regularly. "I forgot to check my Pratt email" is an invalid excuse.

I try to make the assignments, announcements, and other documents I post on the *LMS* as universally-readable as possible. The only proprietary program you will need to have loaded onto your computer is *Acrobat Reader*, which can be downloaded here: <http://www.adobe.com/products/acrobat/readstep2.html>. I strongly recommend that you use *Acrobat Reader*, rather than another program, to read all of the PDF's provided in this class.

**\*Important\*:** If you should have any problems with the *LMS*, you should:

1. Report the problem to the **Service Desk** and receive a "ticket number" by one of four means:
  - a. visiting their office in the basement of the Engineering Building; or
  - b. calling (718) 636-3765; or
  - c. emailing [services@pratt.edu](mailto:services@pratt.edu); or
  - d. using the "Submit a Service Request" function on the *Campus Tech* tab of [my.pratt.edu](http://my.pratt.edu).
2. Receive an email from the **Service Desk** assigning your problem a "ticket number".
3. Forward this email from the **Service Desk** to me.

In order for me to verify claims of *LMS* outages, you must contact the **Service Desk** when the LMS problem occurs, not hours or days later.

### **Reduced-Paper-Use Classroom:**

Whenever possible, we will reduce the amount of paper that this course consumes. All of your out-of-class assignments, including the two-dimensional component of your project, must be submitted electronically via the *LMS*. Your work will be graded and returned electronically. Please do your best to reduce the amount of printing that you do for the course.

## Readings:

You will be assigned all readings (see **Weekly Units** above) from:

Carroll, Sean B. (2009). *Into the Jungle: Great Adventures in the Search for Evolution*, First Edition. Pearson Benjamin Cummings, San Francisco, California. ISBN #978-0-321-55671-4, \$26.20.

This book is required and can be purchased from the PrattStore and is also available on reserve in the Pratt Brooklyn library. Optional readings will be posted on the *LMS*. You are encouraged to save paper by viewing these readings electronically (as opposed to printing them out).

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## Classroom Civility and Academic Honesty:

I expect you to maintain the civility and integrity of our course in and out of the classroom. In class, this means arriving on time, turning off cell phones and refraining from sending text messages, maintaining focus on class discussion, respecting the right of others to speak, and leaving the classroom in good condition (among other things). Out of class, this means properly citing all work that is not your own (in other words, not plagiarizing).

Plagiarism means presenting, as one's own, the words, the work, information, or the opinions of someone else. It is dishonest, since the plagiarist offers, as his/her own, for credit, the language, or information, or thought for which he/she deserves no credit. Types of plagiarism include: (1) The use of any material from any source other than yourself in a paper or project without proper attribution. This includes material from the Internet, books, papers or projects by other students, and the media; (2) The extensive use of the ideas of others in your work without proper attribution; and (3) Turning in work done by another person, downloaded from the web, purchased from any agency or supplier, as one's own. Plagiarism occurs when one uses the exact language of someone else without putting the quoted material in quotation marks and giving its source. The method for documenting sources and references is established by a number of standards: please choose one of these standards (such as the *MLA Handbook for Writers of Research Papers* or the *Chicago Manual of Style*) and use it consistently. Any paper submitted that does not use proper referencing will not be marked.

Any disruptive, disrespectful, or dishonest behavior will be promptly reported to the appropriate campus authority. Students must adhere to all Institute-wide policies which include policies on attendance, academic integrity, plagiarism, computer, and network use. Please see [http://www.pratt.edu/student\\_life/student\\_affairs/student\\_policies/](http://www.pratt.edu/student_life/student_affairs/student_policies/) (click on *Online Student Handbook*) for policies and procedures for handling academic conduct issues.

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## Help with Writing:

Your *Final Project* in this class will require you to produce written work. All students can benefit from feedback on their writing. I am happy to read and respond to rough drafts of either assignment, provided they are emailed to me no later than 5 days before the day the work is due.

Pratt's *Writing and Tutorial Center* can also help you produce the best project possible. The center is located on the 1<sup>st</sup> Floor of North Hall (it has all the great fish tanks... you can't miss it!). Call them at (718) 636-3459 or send an email to [wtc@pratt.edu](mailto:wtc@pratt.edu) to make an appointment.

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## Rights of Students with Disabilities:

If you have a physical or learning disability, ADD/ADHD, chronic disease, or physical condition that we should know about, please contact Mai McDonald at 718-636-3711, to discuss your needs and how we can best serve you. In order to receive classroom accommodations and other services, you must have documentation of your disability on file in our office. Your records will be kept completely confidential. For more information, please see the Pratt webpage for Disability Services ([www.pratt.edu/student\\_life/student\\_services/disability\\_services/](http://www.pratt.edu/student_life/student_services/disability_services/)).