

**** Preliminary Syllabus * Summer 2022 * Subject to change ****

STSC135/HIST035: Modern Biology and Its Social Implications

John S. Ceccatti

Lecturer, History of Science
University of Pennsylvania

Office Hours
by appointment
ceccatti@sas.upenn.edu

General Information

This course covers the history of biology in the 19th, 20th, and 21st centuries, giving equal consideration to three dominant themes: evolutionary biology, classical genetics, and molecular biology. The course is intended for students with some background in the history of science as well as in biology, although no specific knowledge of either subject is required.

We will have three main goals: first, to delineate the content of the leading biological theories and experimental practices of the past two centuries; second, to situate these theories and practices in their historical context, noting the complex interplay between them and the dominant social, political, and economic trends; and, third, to critically evaluate various methodological approaches to the history of science.



Cactus finches, by Elizabeth Gould, from Charles Darwin The Zoology of the Voyage of the H.M.S. Beagle, 1839-43

Course schedule

Class meets MWF 12:00-2:30pm. We will not meet synchronously for this entire time period; part of the time will be devoted to synchronous discussions and part will be available for asynchronous work. Specific synchronous meeting times and asynchronous work will be posted on Canvas.

Course materials

The required and recommended texts are listed below. All except Appleman are available online via the UPenn library. Additional course materials will be made available on the course Canvas website: <https://canvas.upenn.edu>

Required texts

Jim Endersby, *A Guinea Pig's History of Biology*, Harvard, 2009.

Philip Appleman (ed.), *Darwin: Texts and Commentary*, Norton, 3rd ed., 2000.

James D. Watson, Gunther S. Stent (ed.), *The Double Helix: Texts and Commentary*, Norton, 1980.

Additional background text

Jan Sapp, *Genesis: The Evolution of Biology*, Oxford, 2003.

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Course work

Successful completion of the course requires regular and active participation in class meetings, close and critical reading of the assigned texts, and on-time submission of assignments.

Participation

Students are expected to attend synchronous meetings as stipulated by University policy. If you have a legitimate reason to miss class, you must contact the instructor as soon as possible beforehand to arrange to complete any missed work. Missing more than one class could have a negative impact on a student's grade.

Discussions

Each student will be responsible for leading a class discussion along with several other students. All students will be responsible for contributing to each class discussion. (Discussions may be synchronous or asynchronous.)

Projects

There will be one (1) or two (2) projects that will result in short written reports.

Paper

There will be one (1) "directed research" paper. Students will select a topic from a pre-set list; Each topic has specific texts to analyze and a guiding question to be answered.

Test

There will be one (1) test based on all lectures, readings, and discussions up to that point. Specific details will be provided.

Grading criteria

Your grade for the course will be based on successful completion of the assignments according to the following rubric:

1/3 - Class participation, discussions, and projects

1/3 - "Directed" Research Paper

1/3 - Quizzes and "Key Concepts" Notes (in lieu of test)

Letter grades will reflect the following departmental criteria:

A = Outstanding, nearly flawless work; assignments completed thoroughly; technically excellent; evidence of creativity and/or inspiration; deep contextual grasp of issues; and ability to synthesize individual elements into broader historical analysis.

B = Good work; all aspects of assignment(s) completed thoroughly and competently; technically competent; does not consistently show inspiration or deeper grasp of connections, interpretations, and/or synthesis among elements.

C = Work less than satisfactory; assignment(s) not completed thoroughly or according to instructions; basic grasp of issues not always evident; more than occasional technical flaws.

D = Basic work not complete; little effort is evident.

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Course Policies

Academic integrity

All work, written and oral, must be your own or suitably referenced. All work for this course is subject to the university's Code of Academic Integrity. All cases of plagiarism will be subject to both a lowered grade and appropriate university disciplinary policies. Information can be found at the university's academic integrity website: <https://www.college.upenn.edu/academic-integrity>.

If any aspect of this policy is not clear, it is the student's responsibility to clarify this with the instructor prior to any work being submitted.

Written work

All written work must be submitted via the course Canvas site using the Turnitin option. Papers must be double-spaced with standard font, size (10-12 pt.) and margins (1"). Please include your full name on the first page (or put your last name and the page number in the header or footer of every page).

Lateness and grading

All assignments are expected to be turned in on time and in the appropriate format. Extensions will only be granted in the most extraordinary circumstances. This must be arranged with the instructor at the earliest possible time before the due date. In the absence of such arrangements, grades for late assignments will be lowered by a half a grade for each day late.

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Syllabus

Class	Date	Topic
1		Introduction to the History of Biology <ul style="list-style-type: none">❑ Introductions❑ Course overview
2		The Order of Nature <ul style="list-style-type: none">❑ Endersby, Ch.1 <i>Equus quagga</i> and Lord Morton's Mare (pp. 1-28)❑ Quiz and Key Concepts
3		Transmutation and Evolution <ul style="list-style-type: none">❑ Appleman (pp. 39-52)<ul style="list-style-type: none">❑ Malthus (1798) <i>An Essay on the Principle of Population</i>❑ Paley (1802) <i>Natural Theology</i>❑ Lamarck (1809) <i>Zoological Philosophy</i>❑ Lyell (1830-33) <i>Principles of Geology</i>❑ Key Concepts❑ Discussion
4		Darwin and the Voyage of the Beagle <ul style="list-style-type: none">❑ Endersby, Ch.2 <i>Passiflora gracilis</i>: Inside Darwin's Greenhouse (pp. 29-60)❑ Quiz and Key Concepts❑ Darwin (1845) <i>The Voyage of the Beagle</i> (excerpt in Appleman)❑ Darwin Correspondence Project: Voyage of the Beagle
5		Darwin and Natural Selection <ul style="list-style-type: none">❑ Darwin (1859) <i>The Origin of Species</i> (excerpt in Appleman)❑ Darwin <i>Origin</i> analysis❑ Darwin Correspondence Project: Religion

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6		Evolution, Gender, and Race <ul style="list-style-type: none">❑ Darwin (1871) <i>The Descent of Man</i> (excerpt, in Appleman)❑ Richards (1983) "Darwin and the Descent of Woman" (Appleman, pp. 434-444)❑ Adams (1989) "Woman Red in Tooth and Claw" (Appleman, pp. 444-449)❑ Desmond and Moore (2009) Darwin's Sacred Cause: Race, Slavery, and the Quest for Human Origins (excerpt on Canvas)❑ Darwin Correspondence Project: Gender and Race
7		Social Darwinism <ul style="list-style-type: none">❑ Endersby, Ch. 3 <i>Homo sapiens</i>: Francis Galton's Fairground Attraction (pp. 61-94)❑ Quiz and Key Concepts❑ Discussion
8		Mendel and Heredity <ul style="list-style-type: none">❑ Endersby, Ch. 4 <i>Hieracium auricula</i>: What Mendel Did Next (pp. 95-127)❑ Quiz and Key Concepts
9		Heredity and Development <ul style="list-style-type: none">❑ Mendel <i>Experiments in Plant Hybridization</i>❑ Mendel Experimental Analysis❑ Discussion
10		Experimental Genetics <ul style="list-style-type: none">❑ Endersby, Ch. 6 <i>Drosophila melanogaster</i> Bananas, Bottles, and Bolsheviks (pp. 170-208)❑ Quiz and Key Concepts
11		Eugenics <ul style="list-style-type: none">❑ Paul (1995) "What is Eugenics? Why Does It Matter?" <i>Controlling Human Heredity: 1865 to the Present</i> (Ch. 1)❑ Levine and Bashford (2010) "Introduction: Eugenics and the Modern World" in <i>Oxford Handbook for the History of Eugenics</i>❑ Levine (2011) "Bad Blood: Newly Discovered Documents on US Funded Syphilis Experiments"❑ Discussion
12		Genes and DNA

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		<ul style="list-style-type: none"><input type="checkbox"/> Endersby, Ch. 8 Bacteriophage: The Virus that Revealed DNA (pp. 251-291)<input type="checkbox"/> Quiz and Key Concepts
13		The Double Helix <ul style="list-style-type: none"><input type="checkbox"/> Watson and Crick (1953) 2 papers (Watson, pp. 237-247)<input type="checkbox"/> Watson (1968) The Double Helix (Watson, pp. 1-133)<input type="checkbox"/> Crick (1974) "The double helix: A personal view" (Watson, pp. 137-145)<input type="checkbox"/> Klug (1968) "Rosalind Franklin and the discovery of the structure of DNA" (Watson, pp. 153-158)
14		"Big" Biology: Human Genome Project and Biotechnology <ul style="list-style-type: none"><input type="checkbox"/> Endersby, Ch. 12 OncoMouse[®] Engineering Organisms (pp. 411-432)<input type="checkbox"/> Discussion and Review
15		<ul style="list-style-type: none"><input type="checkbox"/> Work on Directed Research Papers
16		<ul style="list-style-type: none"><input type="checkbox"/> Work on Directed Research Papers<input type="checkbox"/> End of course discussion