1. Course Description

In celebration of the 201st anniversary of the birth of Charles Darwin and the 151st anniversary of the first publication of *On the Origin of Species*, this course will examine issues in philosophy of biology in the light of Darwin’s theory. The first third of the course will focus on Darwin’s initial formulation of the theory: its underlying concepts, the logic of Darwin’s “long argument,” the evidence supporting the theory (then and now), Darwin’s replies to objections, how Darwin’s theory contrasts with competing accounts of speciation such as Lamarckianism and special creationism. We will then examine the reception of Darwin’s theory by his contemporaries and critics, and the incorporation of Mendelian genetics into evolutionary biology that culminated in the Modern Synthesis. We will also discuss the recent debate about creationism and intelligent design.

The second third of the course will examine a number of key concepts and issues against the backdrop of the Modern Synthesis. These will probably include adaptationism and its critics, species, fitness, units and levels of selection, laws and explanation, reductionism, functions, and taxonomical issues (systematics, cladistics, etc.)

The final third of the course will examine attempts at applying the approach and conceptual repertoire of biology and evolutionary theory to human beings. Topics we may look at in this section of the course include sociobiology, evolutionary psychology, culture and gene-culture co-evolutionary theory, evolutionary epistemology, ethics and altruism, and human nature.

2. Class Meetings

Class lectures meet Wednesday from 2:30pm – 5:20pm in Room 1248 of Beering Hall.

3. Office Hours and Contact Information

Professor Curd:
Office: 7129 Beering Hall
Email: curd@purdue.edu
Fall Term Office Hours: Monday, 1-3 pm and by appointment

Professor Kelly:
Office: 7126 Beering Hall
Office Phone: 732-932-9861 ext. 114
Email: drkelly@purdue.edu
Fall Term Office Hours: Wednesday, 10:00am – 12:00 pm and by appointment

4. Course Requirements and Grading

Each student registered for the course is required to do the following:

Each week you may write a critical discussion note on some interesting aspect of the assigned readings. You might, for example, criticize an argument or explain why you think the author is confused on some point. These will be no more than 2 to 3 pages, and you can turn in no more than one submission per week. Over the course of the semester, you are required to submit six of these notes, which should be handed in at the beginning of class on Wednesday. You can submit more than six if you wish, but you must write at least six. These will be given a √, √+, or √-. Your six best will count 1/3 towards your grade.

Give one seminar report. See the syllabus for the (tentative!) schedule of topics and readings. Each report should be accompanied by a typed summary. Topics will be doled out on a first come, first serve basis. Your report and summary will be evaluated, but they will not count towards your grade.

Write two research papers (about 15 pages each) on issues central to the course.

We will simply assign letter grades to papers (reflecting the standard 0-100 point grading scale):

100-93: A
92-90: A-
89-87: B+
86-83: B
82-80: B-
79-77: C+
76-73: C
72-70: C-
69-60: D
59-0: F

Final grades will be determined as follows:

6 Best Critical Discussions 33%
Two Papers 33% each (66% total)
Participation 1%

EMAILED AND ELECTRONICALLY SUBMITTED PAPERS WILL NOT BE ACCEPTED. Papers not turned in by the end of class the day they are due are LATE. For each day late, 7 points will be deducted.

5. Course Policies

Emergencies: In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a
revised semester calendar or other circumstances. Information about emergencies changes in the course can be gotten by contacting either instructor via email or phone, or by consulting the course website. Purdue’s Emergency Procedures Handbook and other important emergency planning information is available online at

http://www.purdue.edu/emergency_preparedness/

**Plagiarism:** With the advent of the internet, plagiarism has become an increasingly serious problem at universities around the country, particularly in classes like this one, where papers determine a substantial part of the grade.

In order to avoid plagiarizing from a source, both direct quotations and paraphrases or summaries of material found in traditional print media or on the internet must be acknowledged. If you have any questions about how this definition will be interpreted, please do not hesitate to discuss the matter with me.

Plagiarism and cheating on exams undermines the integrity of the academic community. When undetected, it gives the perpetrator an unfair advantage over students who are graded on the basis of their own work. In this class we will do our best to detect plagiarism and cheating. Students who are aware of violations by others should bring this to my attention. This is the right thing to do. It is also in your own self-interest.

There will be zero tolerance for plagiarism in this course. Plagiarized papers will receive a 0, the student will automatically fail the course, and their name will be handed given to the university authorities. For more on the Purdue University policy on plagiarism, see the following websites:

http://www.purdue.edu/univregs/pages/stu_conduct/stu_regulations.html

http://www.purdue.edu/odos/osrr/academicintegritybrochure.php

With each paper assignment, a handful of students may be selected at random to submit their papers to TurnItIn, an online service that maintains an enormous database of papers that it uses to check for instances of plagiarism.

**External Sources:** Using sources not listed on the syllabus in researching and writing your papers is fine, as long as they are both to the point, and are properly cited. And at all times, when in doubt, cite your sources! It is the best way to avoid being accused of plagiarism.

This is probably the best place to make this point, too: Wikipedia can be valuable for getting a very broad grasp of positions and debates, but when it gets into details, especially on philosophic topics, it is very often horrible – sketchy, convoluted, misinformed, and often simply wrong. If you wish to consult online resources, I suggest you use some of the other, much better sites. Most prominent is the Stanford Encyclopedia of Philosophy, but others are useful as well:

Stanford Encyclopedia of Philosophy  http://plato.stanford.edu/
The Internet Encyclopedia of Philosophy  http://www.iep.utm.edu/
Episteme Links  http://www.epistemelinks.com/Main/MainEncy.aspx
6. Website

Information, comments, and some readings and lecture notes will be posted on the course website, which can be reached via Professor Kelly’s homepage:

http://web.ics.purdue.edu/~drkelly/

The course website itself can be found here:

http://web.ics.purdue.edu/~drkelly/PhilBioSpring2010.html

7. Texts

The following four books will be required for this course:


Other useful resources include the following:

- Tim Lewens website: http://www.hps.cam.ac.uk/research/philofbio.html

Supplemental readings will be posted on the course website as the semester progresses.

8. Topics and Readings

Here is a tentative schedule of topics and readings. Amendments and alterations will be announced in class as we go, both in class and on the webpage. Since reminders and other information will frequently be posted on the course website, *make sure you check the website on a fairly regular basis.*

**Week 1: January 13th**

Before the *Origin* (and after)
Darwin and Wallace

**Required:**
- Books
  - Darwin, *On the Origin of Species* (OS), Introduction
- Online readings
Wallace’s “Sarawak” (1855) and “Ternate” (1858) papers. Available on the Wallace web site [http://web2.wku.edu/~smithch/index1.htm] and on the course website.

- A. R. Wallace, *On the Tendency of Varieties to Depart Indefinitely From the Original Type* (S43: 1858)


**Recommended/Useful/Interesting:**
- **Online readings**

The big picture: the two strands of Darwin’s theory in OS and why it matters
- Malthus, Lamarck, Lyell, Chambers
- Wallace’s route to NS
- Darwin’s route to NS

The Darwin-Wallace debate: Wallace’s panselectionism; Darwin’s pluralism (artificial selection, sexual selection, correlation of growth, inherited effects of use and disuse, direct action of environment: acclimatization)

**Week 2: January 20th**

Darwin’s “long argument” in OS

**Required:**
- **Books**
  - Darwin, OS, Ch. 14; Chs. 1-5, 8, 10-13
  - Excerpts from Wallace, *Darwinism* (London and New York: Macmillan, 1889), Ch. 7.

**Recommended/Useful/Interesting:**
- **Online readings**

Victorian philosophy of science: Herschel, Whewell, Mill; the *vera causa* principle
- Darwin’s argument for NS
The explanatory scope and power of Darwin’s theory
Darwin’s case against special creationism
The Darwin-Wallace debate: sexual dimorphism, interspecific sterility and speciation, group selection
The descent of man

Week 3: January 27th

“Difficulties on theory.”

Required:
  • Books
    o Darwin, OS, Ch. 6, 7, 9

Recommended/Useful/Interesting:
  • Online readings
    o Darwin, excerpt from 6th edn of OS, reply to Mivart

The reception of OS.
Absence or rarity of transitional varieties
Origins of peculiar habits and structures
Organs of extreme perfection and complication
Organs of little apparent importance
Fleeming Jenkins and blending inheritance; Darwin’s theory of pangenesis, Weismannism
Lord Kelvin and the age of the earth

Week 4: February 3rd

The new synthesis

*E. Sober, PB, Ch. 1

The rediscovery of Mendel in 1900
Dispute between Mendelians and biometricians
The Hardy-Weinberg Law (1908)
Fisher, Haldane, Wright (1920s and 30s): population genetics; evolution as changes in gene frequencies
Natural selection, mutation, migration, drift, meiotic drive
Is NS a force or cause?
The drift vs selection controversy: gene polymorphism and the neutral theory of evolution

**Week 5: February 10**

Creationism and intelligent design

*Plantinga and McMullin, H&R, 671-754
*E. Sober, PB, Ch. 2
Several papers by Sober available on his web site in the section “On Intelligent Design and Naturalism v. Supernaturalism” at [http://philosophy.wisc.edu/sober/recent.html](http://philosophy.wisc.edu/sober/recent.html)
For his latest thinking, see, especially, “Why Methodological Naturalism?” and “Evolution without Naturalism”

The demarcation principle saga
US constitutional law
Recent cases: McClean (1982), Dover (2005); some unhappy philosophers (Laudan, Monton)
Sober’s criticisms of ID; the likelihood principle
Naturalism

**Week 6: February 17**

**Topic**: Adaptationism and its Critics

**Required:**
- Book:
  - *Philosophy of Biology*, Chapter 5 ‘Adaptationism’
    - Sober, 121 – 145
  - In Hull & Ruse’s *The Philosophy of Biology*, ‘The Leibnizian Paradigm’
    - Dennett, 38-51
- Online:
  - Reeve & Sherman, ‘Adaptations: Meanings’

**Recommended/Useful/Interesting:**
- Books:
  - *The Philosophy of Biology*, PART II: Adaptationism
    - Papers in Hull & Ruse, 3 – 86
  - *Darwin’s Dangerous Idea*, Chapters 9 & 10 ‘Searching for Quality’ and ‘Bully for Brontosaurus’
    - Dennett, 229 – 312
- Online:
  - J. M. Smith, ‘Optimization Theory in Evolution’

**Topic**: Functions

**Required:**
- Online:
  - Larry Wright “Functions”
  - Robert Cummins “Functional Analysis”
Recommended/Useful/Interesting:

• Books:
  o *The Philosophy of Biology*, PART IV: Function
    ▪ Papers in Hull & Ruse, 221 – 292
  o *Darwin’s Dangerous Idea*, Chapters 8 ‘Biology is Engineering’
    ▪ Dennett, 187 – 228

• Online:

Week 7: February 24th

Topic: Fitness

The tautology problem
Definitions and interpretations of fitness

*E. Sober, Ch. 3


Topic: Reduction and reductionism

Models of theoretical reduction
Does classical genetics reduce to molecular biology? The “many-many” problem
Are there laws in biology?


Week 8: March 3rd

Species and Systematics (taxonomy)

*E. Sober, Ch. 6
*B. Mishler and R. Brandon, “Individuality, Pluralism and The Phylogenetic Species Concept”. H&R 300-318
*M. Ereshefsky “Eliminative Pluralism”. H&R 348-368


The Linnaean hierarchy
Evolution, natural kinds and essentialism
Cladism vs. pheneticism vs. evolutionary taxonomy
Pluralism vs. monism

Week 9: March 10th

Topic: Units and levels of selection

Required:
  • Book:
    o Philosophy of Biology, Chapter 4 ‘The Units of Selection Problem’
      ▪ Sober, 89 – 120
  • Online:

Recommended/Useful/Interesting:
  • Books:
    o The Philosophy of Biology, PART III: Units of Selection
      ▪ Papers in Hull & Ruse, 147 – 220
    o Darwin’s Dangerous Idea, Chapters 11 ‘Controversies Contained’
      ▪ Dennett, 313 – 334
  • Online:
    o Lloyd, E., ‘Units and Levels of Selection’
    o Wilson & Wilson, ‘Rethinking the Theoretical Foundation of Sociobiology’

Catch up

FIRST PAPER DUE

No Class: Spring Break March 15-20

Week 10: March 24th

EVOLUTION AND HUMANS

  Topic: Sociobiology and Evolutionary Psychology
  • Philosophy of Biology, Chapter 7 ‘Sociobiology and the Extension of Evolutionary Theory’
    o Sober, 188 – 220
  • Online readings
    o Griffiths, ‘Ethology, Sociobiology, and Evolutionary Psychology’
    o Samuels, ‘Evolutionary Psychology and the Massive Modularity Hypothesis’
    o Cosmides and Tooby, ‘Evolutionary Psychology: A Primer’
Week 11: March 31st

Topic: Gene-culture Coevolution
- *Not By Genes Alone: How Culture Transformed Human Evolution*, Chapters 1-3
  - Richerson & Boyd, 1 – 98

Week 12: April 7th

- *Not By Genes Alone: How Culture Transformed Human Evolution*, Chapters 4-6
  - Richerson & Boyd, 99 – 236

Week 13: April 14th

- *Not By Genes Alone: How Culture Transformed Human Evolution*, Chapters 7
  - Richerson & Boyd, 237 – 258
- Online readings
  - Machery, NDRB Review
  - Sterelny, ‘The Evolution and Evolvability of Culture’
  - Philosophy and Biology Symposium on *Not By Genes Alone*
    - Mameli, ‘Understanding culture: a commentary on Richerson and Boyd’s *Not By Genes Alone*’
    - Sperber & Claidiere, ‘Defining and explaining culture (comments on Richerson and Boyd, *Not by genes alone*)’
    - Shennan, ‘*Not by Genes Alone: How Culture Transformed Human Evolution*, by Peter J. Richerson and Robert Boyd’
  - Richerson & Boyd, ‘Response to our critics’

Week 14: April 21st

Topic: The Evolution of Language
- Online readings
  - Pinker & Bloom, ‘Natural Language and Natural Selection’
  - Hauser, Chomsky & Fitch, ‘The Faculty of Language: What is it, Who has it, and How did it Evolve?’
  - Richerson & Boyd, ‘Why Possibly Language Evolved’
  - Kirby, ‘The Evolution of Language’

Week 15: April 28th

Topic: Human Nature AND/OR The Evolution of Morality (and Catch-up)
- *The Philosophy of Biology*, PART IV: Human Nature
  - Papers in Hull & Ruse, 369 – 442
- *Darwin’s Dangerous Idea*, Chapters 16 & 17
  - Dennett, 452 – 510
- Online readings
o Machery & Mallon, ‘Evolution of Morality’
o Philosophy and Phenomenological Research Symposium on Richard Joyce’s The Evolution of Morality
  ▪ Joyce, ‘Precis of The Evolution of Morality’
  ▪ Stich, ‘Some Questions About The Evolution of Morality’
  ▪ Carruthers & James, ‘Evolution and the Possibility of Moral Realism’
  ▪ Prinz, ‘Acquired Moral Truths’
  ▪ Joyce, ‘Replies’

SECOND PAPER DUE