

ANTH 407/507: EVOLUTIONARY THEORY
Spring Quarter 2006
301 Condon MW 8:30-9:50am

Instructor: Dr. Josh Snodgrass

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Course Description: This course provides a theoretical framework in evolutionary biology with which to explore human evolutionary history and aspects of modern human biology and behavior. After surveying the historical development of evolutionary theory and the state of current knowledge regarding mechanisms of evolutionary change, we turn our attention to patterns and processes in human evolution. Issues to be addressed in this course include the evolution of primate life histories, the origin of modern human biological variation, and evolutionary medicine.

Course Format: Discussion with weekly group presentations. Participation is an important component of your grade in the class. **Participation is also critical to the success of the class; each of us is responsible for reading the assigned material and actively participating in class discussions.** I encourage you to write down specific questions you have about the readings and also to bring discussion questions you can contribute to class.

Required Readings: Course packet with readings (available online—Blackboard)

Evaluation Criteria: Your grade will reflect your participation in class discussions (35%), your role in a group presentation (30%), and a final research paper (35%).

Class Participation	35%
Group Presentation & Facilitating Discussion	30%
Final Research Paper (Due 6/13)	35%

Beginning in the third week of class, each student will give a presentation as a member of a small group (2-3 students per group). The group will be responsible for giving a short presentation (approximately 15 minutes) on an article related to the topic of the week (you choose this article and it is posted to Blackboard). Your group will then lead class discussion for the day and should integrate the material you've selected with the week's readings. Due to the size of the class, there will be a few weeks with multiple group presentations. Prepared discussion questions are encouraged. Groups should plan to consult with me in the selection of their article. I encourage you select an article on human/primate evolution. **Presentation dates and potential topics will be assigned during the second class meeting (4/5).**

The final research paper will be 12-15 pages (typed, double-spaced). The specific topic of the paper will be of your choosing, provided it is appropriate for the class. The paper should incorporate readings from the course. You are encouraged to meet with me to discuss your paper topic. **The final paper is due at 5:00 pm on 6/13.**

Schedule:

Class	Date	Topics	Required Readings
1	4/3	Course Overview & Requirements	
2	4/5	Evolution: History of an Idea; Setting the Stage; The Pre-Evolutionary Worldview	Bowler 2003 (Chapters 1-4) Goodrum 2004a & 2004b

3	4/10	Darwin Videos	
4	4/12	Darwinian Natural Selection; Variation; The Non-Darwinian Revolution?	Darwin (<i>Origin</i> Ch. 4, 5 & 14; Bowler 1988 (Ch. 1&2)
5	4/17	The Modern Evolutionary Synthesis (Neo-Darwinism); The New Physical Anthropology	Jepsen 1949; Davis 1949 Mayr 1980; Washburn 1951
6	4/19	Adaptation; The Adaptationist Program; Critique of the Adaptationist Program	Mayr 1988 (Ch. 9) Gould & Lewontin 1979
7	4/24	Species Concepts; Variation; Reproductive Barriers; Hybridization; Phylogeny	Chandler & Gromko 1989; Mayr 1988 (Ch. 19 & 20); Meglitsch 1954
8	4/26	<i>Student Presentation & Discussion</i>	
9	5/1	Speciation; Tempo & Mode of Evolution; Allopatric & Sympatric Speciation; Rates of Speciation	Eldredge & Gould 1972; Jackson & Cheetham 1994; Mayr 2001 (Ch. 9 & 10)
10	5/3	<i>Student Presentation & Discussion</i>	
11	5/8	Sexual Selection; Sex; Male-Male Competition; Female Choice	Darwin (<i>Descent</i> Ch. 8); Freeman & Herron (Ch. 10)
12	5/10	<i>Student Presentation & Discussion</i>	
13	5/15	The Evolution of Behavior; Kin Selection and Social Behavior; Altruism; Parent-Offspring Conflict	Wilson 2000 (Ch. 27); Trivers 1974; Alexrod & Hamilton 1981; Dennett 2002
14	5/17	<i>Student Presentation & Discussion</i>	
15	5/22	Development and Evolution; Ontogeny & Phylogeny; Constraint; Developmental Genetics & Evolution	Gottlieb 1992 (Ch. 11) Hall 2003; West-Eberhard 2005; Constraint reading
16	5/24	<i>Student Presentation & Discussion</i>	
	5/29	No Class—Memorial Day	
17	5/31	The Evolution of Life Histories; Ontogeny; Senescence; <i>Student Presentation & Discussion</i>	Stearns 1976; Charnov 1991 Hill & Hurtado 1996 (Ch. 1)
18	6/5	Evolution & Human Health; Darwinian/Evolutionary Medicine	Williams & Nesse 1991; Nesse & Williams 1994 (Ch. 14); Eaton <i>et al.</i> 1999
19	6/7	<i>Student Presentation & Discussion</i>	
		Research Paper Due 6/13 @ 5:00 pm	

Anthropology 407/507
Evolutionary Theory

Course Reader Contents

Week 1

- Goodrum MR. 2004. Prolegomenon to a history of paleoanthropology: The study of human origins as a scientific enterprise. Part 1. Antiquity to the eighteenth century. *Evolutionary Anthropology* 13: 172-180.
- Goodrum MR. 2004. Prolegomenon to a history of paleoanthropology: The study of human origins as a scientific enterprise. Part 2. Eighteenth to the twentieth century. *Evolutionary Anthropology* 13: 224-233.
- Bowler PJ. 2003. The idea of evolution: Its scope and implications (Ch. 1). Evolution: History of an Idea. Berkeley: UC Press. p. 1-26.
- Bowler PJ. 2003. The pre-evolutionary worldview (Ch. 2). Evolution: History of an Idea. Berkeley: UC Press. p. 27-47.
- Bowler PJ. 2003. Evolution in the Enlightenment (Ch. 3). Evolution: History of an Idea. Berkeley: UC Press. p. 48-95.
- Bowler PJ. 2003. Nature and society, 1800-1859 (Ch. 4). Evolution: History of an Idea. Berkeley: UC Press. p. 96-140.

Week 2

- Darwin C. 1859. Natural selection (Ch. 4). On the Origin of Species.
- Darwin C. 1859. Laws of variation (Ch. 5). On the Origin of Species.
- Darwin C. 1859. Recapitulation and conclusion (Ch. 14). On the Origin of Species.
- Bowler PJ. 1988. The myth of the Darwinian revolution (Ch. 1). The Non-Darwinian Revolution: Reinterpreting a Historical Myth. Baltimore: Johns Hopkins. p. 1-19.
- Bowler PJ. 1988. Darwin's originality (Ch. 2). The Non-Darwinian Revolution: Reinterpreting a Historical Myth. Baltimore: Johns Hopkins. p. 20-46

Week 3

- Jepsen GL. 1949. Foreword. In: Jepsen GL (ed.) Genetics, Paleontology, and Evolution, Princeton Press. p. v-x.
- Mayr E. 1980. Prologue. In: Mayr and Provine (eds.) The Evolutionary Synthesis: Perspectives on the Unification of Biology, Harvard University Press. p. 1-48.
- Davis DD. 1949. Comparative anatomy and the evolution of the vertebrates. In: Jepsen GL (ed.) Genetics, Paleontology, and Evolution, Princeton Press. p. 64-89
- Washburn SL. 1951. The analysis of primate evolution with particular reference to the origin of man. *Cold Spring Harbor Symposia on Quantitative Biology* 15: 67-78.
- Mayr E. 1988. How to carry out the adaptationist program (Ch. 9). Toward a New Philosophy of Biology. Cambridge: Harvard University Press. p. 148-159.

Gould SJ, Lewontin RC. 1979. The spandrels of San Marco and the Panglossian paradigm: a critique of the adaptationist program. *Proceedings of the Royal Society of London B* 205: 581-598.

Week 4

Meglitsch PA. 1954. On the nature of the species. *Systematic Zoology* 3: 49-65.

Chandler CR, Gromko MH. 1989. On the relationship between species concepts and speciation processes. *Systematic Zoology* 38: 116-125.

Mayr E. 1988. The species category (Ch. 19). Toward a New Philosophy of Biology. Cambridge: Harvard University Press. p. 315-334.

Mayr E. 1988. The ontology of the species taxon (Ch. 20). Toward a New Philosophy of Biology. Cambridge: Harvard University Press. p. 335-358.

Week 5

Eldredge N, Gould SJ. 1972. Punctuated equilibrium: An alternative to phyletic gradualism. In: Schopf TJM (ed.) Models in Paleobiology. Freeman, Cooper & Co., San Francisco. p. 82-115

Jackson JBC, Cheetham AH. 1994. Phylogeny reconstruction and the tempo of speciation in Cheilostome Bryozoa. *Paleobiology* 20: 407-423.

Mayr E. 2001. Speciation (Ch. 9). What Evolution Is. New York: Basic Books. p. 174-187.

Mayr E. 2001. Macroevolution (Ch. 10). What Evolution Is. New York: Basic Books. p. 188-232.

Week 6

Darwin C. 1872. Principles of sexual selection (Ch. 8). The Descent of Man.

Darwin C. 1872. General summary and conclusion (Ch. 21). The Descent of Man.

Freeman S, Herron JC. 2004. Sexual selection. Evolutionary Analysis (3rd Edition). Prentice Hall. p. 373-418.

Week 7

Trivers RL. 1974. Parent-offspring conflict. *American Zoologist* 14: 249.

Wilson EO. 2000 [1975]. Man: From sociobiology to sociology. Sociobiology. Cambridge: Harvard University Press. p. 547-576.

Axelrod R, Hamilton WD. 1981. The evolution of cooperation. *Science* 211: 1390-1396.

Dennett D. 2002. The new replicators. In: Pagel M (ed.) The Encyclopedia of Evolution. Cambridge. p. E83-E92.

Week 8

Gottlieb G. 1992. Evolution: The Modern Synthesis and its failure to incorporate individual development into evolutionary theory (Ch. 11). Individual Development and Evolution. New York: Oxford University Press. p. 120-136.

Hall BK. 2003. Evo-Devo: Evolutionary developmental mechanisms. *International Journal of Developmental Biology* 47: 491-495.

West-Eberhard MJ. 2005. Phenotypic accommodation: Adaptive innovation due to developmental plasticity. *Journal of Experimental Zoology (Mol Dev Evol)* 304B: 610-618.

Schwenk K. 2002. Constraint. In: Pagel M (ed.) The Encyclopedia of Evolution. Cambridge. p. 196-199.

Pagel M. 2002. Constraints on adaptation. In: Pagel M (ed.) The Encyclopedia of Evolution. Cambridge. p. 199-201.

Week 9

Stearns SC. 1976. Life history tactics: A review of the ideas. *Quarterly Review of Biology* 51: 3-47.

Charnov. 1991. Evolution of life history variation among female mammals. *PNAS* 88: 1134-1137.

Hill K, Hurtado AM. 1996. Life history and demography (Ch. 1). Ache Life History. New York: Aldine de Gruyter. p. 1-40.

Week 10

Williams GC, Nesse RM. 1991. The dawn of Darwinian medicine. *Q Rev Biol* 66: 1-22.

Nesse RM, Williams GC. 1994. Are mental disorders diseases? Why We Get Sick: The New Science of Darwinian Medicine. New York: Times Books. p. 207-233.

Eaton SB, Eaton SB III, Konner MJ. 1999. Paleolithic nutrition revisited. In: Trevathan WR et al. (eds.) Evolutionary Medicine. New York: Oxford University Press. p. 313-332.