

**ANTH 362: HUMAN BIOLOGICAL VARIATION**  
**Fall Quarter 2006**  
**111 Lillis TTh 10:00-11:20**

**Instructor: Dr. Josh Snodgrass**

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**Course Overview:** This course will examine genetic and phenotypic variation in modern humans and our hominid ancestors. A key concept in this course is adaptation; we will use an adaptive framework to understand how human populations have adapted to physical, biological, and social stressors. The course begins with an exploration of biological adaptations in earlier hominid species, and discusses the origin and selective forces associated with the evolution of bipedalism, large body size, encephalization, and language. We then use a biocultural framework to investigate how adaptation to various ecological stressors (e.g., temperature, solar radiation, altitude, and diet/nutrition) promotes human biological diversity. Additionally, we will discuss how recent cultural changes (e.g., agriculture, industrialization, and urbanization) shape human variation and health.

**Required Readings:** Course packet with readings—all readings available on Blackboard

**Evaluation Criteria:** Your grade will reflect your performance on a midterm exam, a take-home final exam, discussion/lab section attendance and participation, and three laboratory exercises.

Midterm Exam (10/31)	30%
Take-Home Final Exam (Due 12/7)	35%
Lab/Discussion Section (Attendance & Participation)	20%
3 Lab Exercises @ 5% Each	15%

Exams and assignments must be taken/turned in at the scheduled time—**under no circumstances will make-up exams or assignment extensions be given without a documented excuse** (e.g., signed note from your doctor). If you will not be able to take an exam or turn in an assignment, you **must** notify me in advance (preferably by e-mail).

Exams will be based on lectures, readings, and videos. The midterm exam will include objective (multiple choice & matching), fill-in-the-blank, short answer (2-3 sentences), and short essay sections (4-5 sentences). The take-home final exam will consist of six essay questions (about two pages each) that require integration of material from the entire course (**not** just the material introduced after the midterm).

Appropriate accommodations will be provided for students with documented disabilities. If you have a documented disability and anticipate needing accommodations in this course, please make arrangements to meet with me soon. Please bring a notification letter from Disability Services outlining your approved accommodations.

**Schedule:**

<b>Class</b>	<b>Date</b>	<b>Topics</b>	<b>Required Readings</b>
1	9/26	Course Overview & Requirements	Mayr 2001 Huss-Ashmore 2000
2	9/28	Introduction to Evolutionary Biology; Forces of Evolution; Adaptation & Adaptability; Homeostasis & Allostasis  <b>Lab 1: Introduction; evolution exercise</b>	Balter 2005
3	10/3	Hominid Origins & Adaptation; Why Bipedalism?	Isbell & Young 1996 Dunbar 1998
4	10/5	Evolution of the Genus <i>Homo</i> ; Brain Evolution; Cultural Evolution & Adaptation; Dispersal  <b>Lab 2: Early hominid anatomical changes and discussion (WRITE-UP OF THIS LAB DUE 10/11)</b>	Leonard et al. 2003
5	10/10	Origin and Dispersal of Modern Humans; The Human Revolution; Language <b>(Guest Lecturer: Dr. Greg Nelson)</b>	Klein 2001 Mielke et al. 2006 (Ch. 1) Kennedy 1995
6	10/12	Describing Human Phenotypic Variation; Social and Biological Concepts of Race; Applied Biological Anthropology and the Concept of Race  <b>Lab 3: Modern human skeletal variation</b>  <b>**Note: Dr. Snodgrass will be at a conference in Japan from 10/7-10/15**</b>	
7	10/17	Human Genetics & Genetic Variation; Genetics and the Origin of Modern Humans	Mielke et al. 2006 (Chs. 2&3) Williams 2005
8	10/19	Population Genetics; Evidence for Recent Selection; Statistical Genetics; Genetic Genealogy  <b>Lab 4: Population genetics (WRITE-UP OF THIS LAB DUE 10/25)</b>	
9	10/24	Climatic Adaptation and Adaptability; Ecological Stressors; Thermal Stress	Kormondy & Brown 7 Kormondy & Brown 8 (pp. 162-173)
10	10/26	Solar Radiation; High Altitude  <b>Lab 5: Anthropometry I: Body size, proportions, and skin reflectometry</b>  <b>**Extra Lecture (Optional), Friday 10/27 "Out in the Cold: Native Siberian Health in the Post-Soviet Era" Knight Law 175 (5:30pm)**</b>	Mielke et al. 2006 (Ch. 11)

11	10/31	<b>Midterm Exam</b>	
12	11/2	Nutritional Evolution; The Paleolithic Diet Lifestyle Change and Health; Secular Change  <b>Lab 6: Dietary analysis &amp; activity recall (WRITE-UP OF THIS LAB DUE 11/8)</b>	Leonard 2000 Kormondy & Brown 10 <b>(These readings are NOT covered on the Midterm)</b>
13	11/7	Thrifty Genotype/Phenotype; Obesity; Chronic Disease	Popkin 2002 Wells 2006
14	11/9	Film: <i>Supersize Me</i>  <b>Lab 7: Anthropometry II: Body fat (BIA, skinfolds) and blood pressure</b>	
15	11/14	Reproduction; Fecundity; Evolution of Human Life Histories	Bogin 2002 Haig 1999 Stinson 2000
16	11/16	Growth & Development  <b>Lab 8: Skeletal &amp; dental growth &amp; development; Aging</b>	
17	11/21	Human Senescence & Aging; Is Menopause Adaptive?	Harper & Crews 2000 Hawkes 2003
	11/23	<b>No Class--Thanksgiving</b>  <b>No Labs 11/22 (HAPPY THANKSGIVING!!)</b>	
18	11/28	Infectious Disease; Evolutionary Medicine	Williams & Nesse 1991 Cooke & Hill 2001
19	11/30	Psychosocial Stress; Socioeconomic Status & Health  <b>Lab 9: Discussion &amp; review for final exam</b>	Sapolsky 2005
		<b>Final Exam</b> <b>Due Thursday, 12/7 by 5:00 pm (you will receive your exam on Thursday, 11/30)</b>	

**Anthropology 362**  
**Human Biological Variation**

*Course Reader Contents*

Week 1

- Mayr E. 2001. What is the evidence for evolution on Earth? In: *What evolution is*. Basic Books: New York, p. 12-39.
- Huss-Ashmore R. 2000. Theory in human biology: Evolution, ecology, adaptability, and variation. In: Stinson S et al. (eds.) *Human biology: An evolutionary and biocultural perspective*. Wiley: New York, p. 1-25.
- Balter M. 2005. Are humans still evolving? *Science* 309: 234-237.

Week 2

- Isbell LA, Young TP. 1996. The evolution of bipedalism in hominid and reduced group size in chimps: alternative responses to decreasing resource availability. *J Hum Evol* 30: 389-397.
- Dunbar RIM. 1998. The social brain hypothesis. *Evol Anthropol* 6: 178-190.
- Leonard WR, Robertson ML, Snodgrass JJ, Kuzawa CW. 2003. Metabolic correlates of hominid brain evolution. *Comp Biochem Physiol* 136A: 5-15.

Week 3

- Klein RG. 2001. Fully modern humans. In: Feinman GM, Price TD (eds.) *Archaeology at the millennium: A sourcebook*. New York: Kluwer. p. 109-135.
- Mielke JH, Konigsberg LW, Relethford JH. 2006. Classifying human biological diversity: A brief history (Ch. 1). In: *Human biological variation*. Oxford U Press: Oxford, p. 3-21.
- Kennedy KAR. 1995. But professor, why teach race identification if races don't exist? *J Forensic Sci* 40: 797-800.

Week 4

- Mielke JH, Konigsberg LW, Relethford JH. 2006. The genetic basis of human variation (Ch. 2). In: *Human biological variation*. Oxford U Press: Oxford, p. 22-46.
- Mielke JH, Konigsberg LW, Relethford JH. 2006. Population genetics and human variation (Ch. 3). In: *Human biological variation*. Oxford U Press: Oxford, p. 47-85.
- Williams SR. 2005. Genetic genealogy: The Woodson family's experience. *Culture Med Psychiatry* 29: 225-252.

Week 5

- Kormondy EJ, Brown DE. 1998. Human adaptation to cold and heat (Ch. 7). In: Kormondy EJ, Brown DE, *Fundamentals of human ecology*. Upper Saddle River: Prentice Hall. p. 131-162.
- Kormondy EJ, Brown DE. 1998. Adaptation to altitude, high activity, and other physical stressors (Ch. 8). In: Kormondy EJ, Brown DE, *Fundamentals of human ecology*. Upper Saddle River: Prentice Hall. p. 162-173.
- Mielke JH, Konigsberg LW, Relethford JH. 2006. Skin pigmentation (Ch. 11). In: *Human biological variation*. Oxford U Press: Oxford, p. 280-302.

## Week 6

Leonard WR. 2000. Human nutritional evolution. In: Stinson S et al (eds.), *Human biology: An evolutionary and biocultural perspective*. New York: Wiley. p. 296-343.

Kormondy EJ, Brown DE. 1998. Modernization, stress, and chronic disease (Ch. 10). In: Kormondy EJ, Brown DE, *Fundamentals of human ecology*. Upper Saddle River: Prentice Hall. p. 227-252.

## Week 7

Popkin BM. 2002. The dynamics of the dietary transition in the developing world. In: Caballero B, Popkin BM (eds.) *The nutrition transition: Diet and disease in the developing world*. Amsterdam: Academic Press. p. 111-128.

Wells JCK. 2006. The evolution of human fatness and susceptibility to obesity: An ethological approach. *Biol Rev* 81: 183-205.

## Week 8

Bogin B. 2002. The evolution of human growth. In: Cameron N (ed.) *Human growth and development*. Amsterdam: Academic Press. p. 295-320.

Haig D. 1999. Genetic conflicts of pregnancy and childhood. In: Stearns SC (ed.) *Evolution in health and disease*. Oxford: Oxford University Press. p. 77-90.

Stinson S. 2000. Growth variation: Biological and cultural factors. In: Stinson S et al (eds.), *Human biology: An evolutionary and biocultural perspective*. New York: Wiley. p. 425-464.

## Week 9

Hawkes K. 2003. Grandmothers and the evolution of human longevity. *Am J Hum Biol* 15: 380-400.

Harper GJ, Crews DE. 2000. Aging, senescence, and human variation. In: Stinson S et al. (eds.) *Human biology: an evolutionary and biocultural perspective*. New York: Wiley-Liss. p 465-506.

## Week 10

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

Cooke GS, Hill AVS. 2001. Genetics of susceptibility to human infectious disease. *Nature Rev Genetics* 2: 967-977.

Sapolsky R. 2005. Sick of poverty. *Sci Am* 293: 92-99.