

**Copyright 2021 Susan Cachel****Human Variation  
Anthropology 356 (01:070:356:01)****Spring, 2021  
S. Cachel**

**The syllabus is available from the class Sakai site, accessible via the Rutgers Sakai portal (<http://sakai.rutgers.edu/portal>). Use your Rutgers Net ID and password to login to Sakai. Then click on this course among the list of courses that you are registered for. The syllabus is listed under the “Resources” section of the class site, and is labeled “356 syb 2021.”**

**Course Venue:** This virtual course is being given asynchronously. Each class will include a PowerPoint presentation and an accompanying sound recording. The PowerPoint will be listed under the Resources section of the class Sakai site. The sound recording will be listed under the Media Gallery section of the class Sakai site. The course material will be put on the class Sakai site on Tuesday and Thursday afternoon. An email Sakai Announcement will be delivered to your Rutgers email address when the course material is posted.

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Office Hours (Spring Semester): Wednesday, 1-2 P.M, via Zoom. The Zoom code and password will be sent to you via email during the first week of class.

**Course Description:**

This is a course in physical anthropology that describes variation in living humans, and identifies the random or adaptive evolutionary processes responsible for this variation. It deals with genetic, anatomical, and physiological differences within and between populations. It deals with the effects of breeding isolation and small population size on human variation. It addresses human biological adaptation to climatic extremes, and the history and differentiation of major human population groups. Two fossil human groups (*Homo erectus* and the Neanderthals) will also be covered, because of adaptations to climatic extremes shown in these groups, and because of their importance in the history of human dispersal worldwide, and questions about the origins of anatomically modern humans. Lastly, the course will deal with modern human settlement throughout the world.

**Course Objectives and Goals:**

Students are introduced to the range of biological variation in living humans. They will understand that human variation has both genetic and environmental (including cultural) components, and that these components frequently interact. This variation has been evolving through time, as humans adapt to different environmental circumstances, and some of this variation is non-adaptive. Students will understand how humans are changing now, because

human evolution is continuing. Students will be introduced to how variable human traits are analyzed. Students will be able to analyze and to think critically about articles in the popular press that deal with human differences, including genetic differences, and human adaptation and adaptability.

### **Required Texts:**

1. Kenneth Kamler. 2004. *Surviving the Extremes. What Happens to the Body and the Mind at the Limits of Human Endurance*. Penguin. (paperback).
2. Stephen Molnar. 2005. *Human Variation: Races, Types, and Ethnic Groups*. 6<sup>th</sup> ed. Prentice Hall. (paperback).
3. John Relethford & Deborah Bolnick. 2018. *Reflections of Our Past. How Human History is Revealed in Our Genes*. 2<sup>nd</sup> ed. Routledge (paperback).

All texts are available from the Rutgers University Bookstore on Somerset Street in downtown New Brunswick.

The class Sakai site is accessible via the Rutgers Sakai portal (<http://sakai.rutgers.edu/portal>). Login using your Rutgers net I.D. and password. Class announcements will appear here. You must regularly check your Rutgers email account to see these announcements directly after they are emailed out. Necessary course material is downloadable from this site (e.g., the syllabus, tables, pdf files of papers, etc.)

**Attendance Policy:** Students are expected to keep up with all classes and class readings, and to submit coursework on time. If you are having difficulty keeping up or completing coursework, you must use the University absence reporting website to indicate the dates and reasons for your absence. An e-mail is then automatically sent to instructors. The URL for this website is <https://sims.rutgers.edu/ssra/>. In cases where students miss classes and coursework for periods longer than a week, this website will automatically direct them to consult a Dean of Students for assistance, and will help to verify the circumstances of their absence. If you are experiencing health or family problems because of the coronavirus, contact the Academic Deans immediately.

**Scholarship and Class Etiquette:** The Rutgers School of Arts and Sciences mandates that instructors immediately report all cases of suspected plagiarism and cheating to the Academic Deans.

### **Course Requirements:**

**Two exams** each account for 25% of the final grade, for a total of 50%. The second exam is not cumulative. The format of the exams will be short essays. You will be given several days to submit the exam via the Assignments section of the class Sakai site. **Participation in Sakai Chat Forums** on two topics accounts for 10% of the final grade. **Four video responses**

each account for 5% of the final grade, for a total of 20%. Each response will answer several questions that I will pose on the Assignments section before the video.

**A short paper** (4-5 pages, double-spaced) will account for 20% of the final grade. Using information and an anthropological perspective provided by this course, the short paper should critically analyze a recent popular magazine article (e.g., one appearing in *National Geographic*, *The New Yorker*, *Self*, *Discover*, *Psychology Today*, *Scientific American*) or a major newspaper article (e.g., a multi-page article appearing in the weekly *Wall Street Journal* or *New York Times* Science section) published within the last 1-2 years. The full citation for the article must appear at the beginning of the paper. The article must deal with a topic covered in the course. Ask me, if you are in doubt about the appropriateness of an article. You must analyze the article, not simply describe it. The short paper is due on the last day of class (May 3<sup>rd</sup>).

Lecture material is up-to-date and interpretive, and may not be covered in the textbooks. Lecture material will be intensively covered in the exams.

## **COURSE SCHEDULE, TOPICS, & READINGS**

Week of January 19 Introductory (course topics and requirements)

History of the Study of Human Adaptation & Variation  
 Cachel 2003 Grzimek.pdf (pdf file on Sakai)—click on “Resources”  
 Relethford & Bolnick, pp. 1-40

Week of January 25 The Structure of DNA; Chromosomal Territories and Interactions  
 Relethford & Bolnick, pp. 41-71

Comparative Genomics; Cell Division & Gametogenesis  
 Molnar, ch. 1; Relethford & Bolnick, pp. 213-232

Week of February 1 Principles of Genetics  
 Relethford & Bolnick, pp. 233-242 (studying DNA)

Simple Mendelian Genetics; Pedigree Analysis

Week of February 8 Populations; Population Isolates; Irish History as an Example of  
 Population Change  
 Relethford & Bolnick, pp. 163-182

Natural Selection & Random Change in Small Groups  
 Relethford & Bolnick, pp. 183-211

Week of February 15 Dominant & Recessive Inheritance in Humans; Evolutionary  
 Development (“Evo-Devo”) in Humans  
 Molnar, ch. 2

Week of February 22 **Participation in 2 Chat Forums on the Class Sakai site (10% of final grade)**. 1. Examining human traits of purely genetic determination (e.g., dental traits) & human traits determined by both genetics and environment (e.g., handedness).  
 2. Human evolution in populations through time. Read “The Thousand Year Graveyard,” by Ann Gibbons, *Science*, Dec. 13, 2013. The text, slideshows, and videos are accessible at [http://scimag/thouyear](http://scimag.thouyear). This material explores the changing record of death and disease in a 1,000-year-old graveyard in Tuscany, in northern Italy. It therefore explores ongoing human evolution within the same local population.

**1<sup>st</sup> Video: “Ghost in Your Genes”**

**Turn in response answers to questions that appear in the Assignments section.**

Week of March 1 Mutations; Aneuploidy; Sex-Linked & Sex-Limited Inheritance in Humans; Imprinting; Chromosomal Abnormalities; Genes & Development  
 Molnar, ch. 7

**2<sup>nd</sup> Video: “Spillover: Zika, Ebola, and Other Emerging Pathogens”**

**Turn in response answers to questions that appear in the Assignments section.**

Week of March 8 Balanced Polymorphism in Humans  
 The Online Mendelian Inheritance in Man (OMIM) database; Human Behavioral Genetics

Nutrition & Disease; Parasites and Human Evolution  
 Kamler, pp. 17-83

The Human Microbiome; Disease & Human Evolution

**Week of March 15—NO CLASSES (Spring Recess)**

Week of March 22 **EXAM I**—Topics from January 19-March 15. You will be given several days to answer the exam’s essay questions, which will appear in the Assignments section of the class Sakai site.

Variation in Human Size & Shape; Human Sexual Differences (Sexual Dimorphism)  
 Molnar, ch. 5

Week of March 29 Variation in Human Pigmentation (Skin, Hair, & Eyes); Dermatoglyphics; Craniofacial & Dental Variation  
 Molnar, ch. 6

Variation in Human Biochemistry (Human Protein Polymorphisms)  
 Molnar, ch. 3

Week of April 5 Variation in Human Blood Groups; the HLA System  
 Molnar, ch. 4

Heat Adaptation as an Explanation for Variation; *Homo erectus*; dispersal to Eurasia; insular dwarfing in *Homo erectus*? (Human fossil material from the island of Flores—what is it?)  
Kamler, pp. 124-155

Week of April 12 **3<sup>rd</sup> Video: “Deadly Ascent”**

**Turn in response answers to questions that appear in the Assignments section.**

Altitude Adaptation as an Explanation for Variation  
Kamler, pp. 211-235; Kamler, pp. 183-211

Week of April 19 Cold Adaptation as an Explanation for Variation; the Neanderthals

The Problems of Classifying Humankind; Population Differentiation & Population History; How Far Back Can Modern Variation be Traced? Modern Human Origins—Hybridization with Neanderthals, Denisovans, and at Least 2 Other Fossil Human Groups  
Cachel 2012 Peopling of the Globe.pdf (pdf file on Sakai); Molnar, ch. 8; Relethford & Bolnick, pp. 73-96

Week of April 26 Human Population Differentiation in Eurasia; Human Population Differentiation in Sub-Saharan Africa; Amerinds, Eskaleuts (Eskimos [Inuit] and Aleuts), & the Peopling of the Americas; Australoids & the Peopling of the Pacific; Modern Humans Colonize the Entire Globe through Biological and Cultural Factors  
Molnar, ch. 9; Relethford & Bolnick, pp. 97-120

**May 3 4<sup>th</sup> Video: “First Peoples—Australia”**

**Turn in response answers to questions that appear in the Assignments section.**

Relethford & Bolnick, pp. 121-162

**SHORT PAPER DUE!**

**EXAM II (topics from March 22-May 3).** The exam will be given during the Final Exam period, which begins on May 6<sup>th</sup>. You will be given several days to answer the exam’s essay questions, which will appear in the Assignments section of the class Sakai site.