



## Anthropology 62

### Health and Disease in Evolutionary Perspective

Class Time: MWF 12:30-1:35

Class Location: Silsby 317

**Instructor:** Vivek V. Venkataraman

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**Office:** Silsby 408A

**Office Hours:** Wednesday 2-4pm or by appointment

**Course Description:** Why do we get sick? Are illness and disease pathological conditions that we should strive to eliminate or, in some cases, could they instead be associated with important biological functions? In the past 20 years, the emerging science of Evolutionary Medicine has provided a framework merging evolutionary theory with medical science that challenges traditional concepts of health and sickness. The objective of this course is to explore how evolutionary perspectives on human biology (e.g., phylogeny, adaptation, and life history tradeoffs) can provide insight into human health and disease. Through a comparative approach that considers the evolutionary, physiological, and cultural bases of human health and disease, this course asks students to critically analyze prevailing medical concepts of 'normal' physiology.

The course will begin with discussion of key evolutionary principles and dynamics: natural selection, adaptation, tradeoffs, and phylogeny. We will then consider various topics in the following areas:

- i) Human diet, nutrition, and energetics: past and present
- ii) Defenses
- iv) Human sociality
- iv) Life history and reproduction

These topics will be considered during lectures and class discussions. They will be based on readings in anthropology, evolutionary biology, and the medical sciences. Readings assigned for each date should be read carefully before class.

**Prerequisite(s):** None.

**Text 1:** *Why We Get Sick (WWGS)*, 1<sup>st</sup> Edition

**Authors:** GC Williams and RM Nesse

**Text 2:** *Principles of Evolutionary Medicine (PEM)*

**Authors:** P Gluckman, A Beedle, and M Hanson

### Course Objectives:

At the completion of this course, students will be able to:

1. Apply principles of Evolutionary Medicine to analyze selected diseases and illnesses
2. Analyze public health issues within an anthropological framework incorporating biological, social, and cultural factors
3. Self-assess and further develop skills in scientific and anthropological research, including: literature review, identifying gaps for future inquiry, and developing original and synthetic arguments in writing

### Assessment (100 points total):

Weekly opinion papers	25 pts
Minute papers	5 pts
Midterm Exam	30 pts
Final Paper	30 pts
Final Presentation	10 pts

### Letter Grade Distribution:

$\geq 94.00$	A	74 - 76	C
90 - 93	A-	70 - 73	C-
87 - 89	B+	67 - 69	D+
84 - 86	B	64 - 66	D
80 - 83	B-	60 - 63	D-
77 - 79	C+	$\leq 60$	F

**Midterm exam** The midterm exam will test students' comprehension of principles and case studies from lectures, discussions, and assigned material. The exam will be comprised of multiple choice, fill in the blank, short answer, and essays. The exam will emphasize the fundamental principles explored during the first few weeks of the quarter.

**Minute papers** At the conclusion of selected class periods, students will spend one minute answering a question posed by the instructor. These short papers serve to gauge attendance, assess comprehension, and attain feedback from the students. Graded 1(present)/0(unexcused absence).

**Opinion papers** One-page papers (double-spaced) will be due on a weekly basis (Weeks 2-4 and 6-8). These must be posted to Canvas by midnight Tuesday. These papers will form the basis for discussion during the week's class periods and are intended to improve critical reasoning capacities and writing ability. The papers should state a problem or central aspect encountered in the week's readings and lectures (or in the material covered following the previous opinion paper), then develop a thesis with respect to the material. These should not be summaries but instead adopt a critical stance [for example: a pro or con position, expand upon a flawed assumption, reveal a gap in the literature, propose a health care solution, etc...]. The topics are completely open-ended, and I encourage you to bring in

perspectives from your daily life and current events. The papers will receive a grade between 0 (not submitted) and 10 (excellent). Proper punctuation, spelling, grammar, and creativity are part of that assessment. The instructor will provide feedback on each paper via Canvas.

### **Course Policies:**

- **Academic Integrity and Dartmouth Honor Principle**

- Students are expected to live up to the Dartmouth Honor Principle and not participate in behaviors—including cheating and plagiarism—that compromise it. For information on how to reference sources, please see Sources, Their Use, and Acknowledgement at: <http://www.dartmouth.edu/sources/>.

- **Students with disabilities**

- Students with learning, physical, or psychiatric disabilities who may need classroom accommodations are encouraged to see me before the end of the second week of the term. Discussions will remain confidential, but the Student Accessibility Office may be consulted to discuss how to best implement the requested accommodation.

- **Religious observances**

- If you have a religious observance that may conflict with your participation in the course, please speak with me before the end of the second week of the quarter to discuss appropriate accommodations.

- **Use of computers in the classroom**

- It has become commonplace for students to take notes on their laptops or iPads. If you take notes on a screened device, that is fine. You are NOT allowed to use your computer to browse the internet (unless I ask you to do so), check your email or Facebook, or watch YouTube videos- it is counterproductive and distracting to those around you.

**Tentative Course Outline:** The weekly coverage is likely to change slightly throughout the course. See Canvas for more specifics on the weekly assignments, and be sure to check Canvas frequently for updates.

Week	Content and Assignments
Week 1	<ul style="list-style-type: none"> <li>• <b>Monday March 28:</b> Introduction</li> <li>• <b>Wednesday March 30:</b> Natural selection and adaptation (WWGS Preface, Chs. 1-2; PEM Ch. 1)</li> <li>• <b>Friday April 1:</b> Levels of analysis and tradeoffs (WWGS Ch. 7, PEM Ch. 2)</li> </ul>
Week 2	<ul style="list-style-type: none"> <li>• <b>Monday April 4:</b> Phylogeny and legacies of evolutionary history (WWGS Ch. 9, PEM Ch. 3, Neil Shubin podcast)</li> <li>• <b>Wednesday April 6:</b> Human evolutionary history (PEM Ch. 6)</li> <li>• <b>Friday April 8:</b> Hunter-gatherers as models for the past (Zuk article, NYT Caveman, Hadza video)</li> </ul>
Week 3	<ul style="list-style-type: none"> <li>• <b>Monday April 11:</b> Human diet (WWGS Ch. 10, Lieberman podcast)</li> <li>• <b>Tuesday April 12:</b> X-hour (Human skeleton and fossil lab)</li> <li>• No class the rest of this week</li> </ul>
Week 4	<ul style="list-style-type: none"> <li>• <b>Monday April 18:</b> Energetics and diabetes (PEM Ch. 8, Diamond 1987, Lustig lecture)</li> <li>• <b>Tuesday April 19:</b> Guest lecture on polar diets</li> <li>• <b>Wednesday April 20:</b> Recent and future human evolution (Hawks Sci Am)</li> <li>• <b>Friday April 22:</b> Human social behavior (Zuk book chapter)</li> </ul>
Week 5	<ul style="list-style-type: none"> <li>• <b>Monday April 25:</b> Biology of hierarchy and inequality (PEM Ch. 10, The Trouble with Testosterone)</li> <li>• <b>Wednesday April 27:</b> Mental disorders (WWGS Ch. 14)</li> <li>• <b>Friday April 29:</b> Midterm Exam</li> </ul>
Week 6	<ul style="list-style-type: none"> <li>• <b>Monday May 2:</b> Theory of defenses (WWGS Ch. 3, 5, and 6, PEM Ch. 10)</li> <li>• <b>Wednesday May 4:</b> Allergies (WWGS Ch. 11)</li> <li>• <b>Friday May 6:</b> Parasites (Radiolab)</li> </ul>
Week 7	<ul style="list-style-type: none"> <li>• <b>Monday May 9:</b> Human life history evolution (PEM Ch. 5)</li> <li>• <b>Wednesday May 11:</b> Developmental origins of adult health (PEM Ch. 4, Ahmed 2010, Bateson 2004)</li> <li>• <b>Friday May 13:</b> Aging (WWGS Ch. 8)</li> </ul>
Week 8	<ul style="list-style-type: none"> <li>• <b>Monday May 16:</b> Cancer (WWGS Ch. 12)</li> <li>• <b>Wednesday May 18:</b> Skin color (Jablonski TED talk)</li> <li>• <b>Friday May 20:</b> Race, human variation, and personalized medicine (Kahn article)</li> </ul>
Week 9	<ul style="list-style-type: none"> <li>• <b>Monday May 23:</b> Presentations</li> <li>• <b>Wednesday May 25:</b> Presentations</li> <li>• <b>Friday May 27:</b> Presentations</li> </ul>
Week 10	<ul style="list-style-type: none"> <li>• <b>Monday May 30:</b> Memorial Day, no class (Final papers due at midnight)</li> </ul>