

**HCOL 185H**  
**Evolutionary Medicine**  
MWF 9:40 – 10:30am  
UNIVERSITY HEIGHTS NORTH 016

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**Office Hours**

By appointment

**This course will address several important questions, including but not limited to:**

- Why do modern *Homo sapiens* suffer from so many lifestyle diseases
- Why does *Homo sapiens* get diabetes?
- What makes HIV/AIDS such a troubling public health problem?
- Can an understanding of evolutionary biology help us design better therapies to treat cancer?
- Where do diseases like Ebola come from, and why are they so lethal?
- So, exactly what kind of running shoes should I be wearing? And how am I supposed to run?

This course introduces a new field, *Evolutionary Medicine*, the study of disease, pathology, and treatment through lens of Darwinian evolution. It will explore the very basics of disease and illness, asking questions such as the ones outlined above, and many others. The course will triangulate methods—historical perspectives, narratives of the disease experience, and purer scientific approaches—to present an integrated picture of various diseases and their evolutionary origin. It will include several activities designed to enrich student understanding of biology, evolution and medicine: **journal clubs**, **public engagement activities**, **computational modeling exercises**, and **oral presentations**. The course will be seminar-styled (with some lecture material introducing essential concepts), discussion-heavy and reading/writing intensive. Students will engage material ranging from the primary scientific literature to exploratory essays, and personal narratives of disease. In addition, the course will offer an elementary introduction to modern methods used to study evolutionary processes in human disease, such as genomics and computational biology. The course is specifically designed to be accessible to any student (all majors) with a strong interest in the sciences, and not only those with a scientific background. There are no formal prerequisites, though an advanced level high school biology course and mathematics through pre-calculus are preferred.

### **A sample of the topics we *may* cover**

Introduction to scientific and statistical reasoning

A History of Evolutionary Thought

History and Philosophy of Medicine

Anatomy and Injuries in *Homo Sapiens*

Microbes, Mosquitoes, and Me: Malaria and Humankind

HIV and AIDS

What is personalized medicine?

Emerging infectious disease: Rise of the “Andromeda Strains”

Cancer: *The Emperor of All Maladies*

Sex. And Reproduction

Why do we age?

### **Reading materials**

#### Required:

*Story of the Human Body* by Daniel Lieberman

#### Possibly Required:

*Evolutionary Medicine* by Stephen C. Stearns and Ruslan Medzhitov

Other:

Other readings will be provided by yours truly. Essays, book chapters, slide presentations, etc.

### **Grades**

This is an honors *seminar*. This course is not supposed to be very lecture-based. Not very standard exam-based. But it will be *challenging*. I will, however, offer many different ways to demonstrate mastery of the material. I will also provide grading rubrics whenever I can.

### **Assignments will include:**

Class participation

Reading/Writing journals

Class presentations (group and individual)

Social media and advocacy projects

Term papers, other ideas

Primers: Class projects where groups have to present on a broader topic. This will require collaboration, background research.

Example topics:

Steering culture for better health

Mathematical modeling in infectious disease

Personalized or “Precision” medicine

Genetically-modified organisms

Can we reverse aging?

A public health Take on the antibiotic resistance catastrophe

Tech Conversations:

For *Tech conversations*. We will have weekly tech exchanges, dialogues on a topic. We will start with questions, everyone can chime in. Post articles. Post links. Post memes.

The point of this? Your generation needs to get used to discussing things intelligently in cyberspace.

“Weekly” writing assignments:

Students are to write essays, 500-1000 words in length, based on a set of thought questions, related both to class discussion and the reading materials.

Grading Rubric: 50% clarity, 50% authenticity.

Statistical breakdown of course grades: The easiest way to think about it: 50% written material, 50% other material. I will explain further as assignments arise. Just do everything, contribute, write well, read a lot, help out your classmates...and you'll be fine.