

USC Dornsife
College of Letters,
Arts and Sciences

HBIO 405 – Evolutionary Medicine (4 units)

Fall 2023

Lectures: Tuesday and Thursday 12:30-1:30

Professor: Dr. Gioia Polidori

- Lecture Location: LVL17
- Office: AHF B40
- Email: gpolidor@usc.edu
- Office hours Tue & Thu 2-3:30 AHF 251

I. Course Content: This is an interdisciplinary course discovering the evolutionary, cultural, and environmental factors in the emergence and existence of human diseases with a focus on the Darwinian (evolutionary medicine) examination of illness.

II. Learning Objectives

- Explain how selective pressures led to the evolution of pathogens as well as the evolution of human anatomy, physiology and pathology.
- Apply knowledge of human evolutionary biology to explain how genetic variation in humans affects risk, diagnosis, and treatment of disease.
- Apply knowledge of human evolutionary biology to explain how sociocultural factors affect risk, diagnosis, and treatment of disease.
- Explain how evolution contributed to variation in pathogen populations, thus affecting their virulence and therapeutic approaches.
- Identify, compile, analyze, interpret, synthesize and criticize relevant sources of scientific evidence to effectively present to peers selected topics in the evolutionary biology and medicine
- Use relevant sources of scientific evidence to construct a well-supported, logical argument for the resolution of ethical, social, and environmental issues
- Apply biological knowledge for the resolution of ethical, social, medical, and environmental issues.

III. Prerequisite: BISC 120

IV. Required Textbook:

Principles of Evolutionary Medicine by Gluckman, Beedle, and Hanson (2015)

V. Grading Breakdown

Exam 1	25%
Exam 2	25%
Exam 3	25%
Project	20%
Quizzes	5%
JEP	2.5% extra credit

VI. Grading scale

- The grading scale is based on the traditional scale as follows:

	A (≥93%)	A- (≥90%)
B+ (≥87%)	B (≥83%)	B- (≥80%)
C+ (≥77%)	C (≥73%)	C- (≥70%)
D+ (≥67%)	D (≥63%)	D- (≥60%)
F (≤59.9%)		

VII. Description and Assessment of Assignments/Exams

- Class material will be evaluated via quizzes, the final project, and exams.
- Quizzes will be given at the end of each module on blackboard and will be based on the material presented in the lecture recordings. Exams will not be given a letter grade. Only the final grade will be given a letter grade.
- For the project you will choose a disease to thoroughly investigate in terms of evolution, previous and current treatments, genetic impacts/coevolution, and possible future implications. A handout with further instruction will be presented in class. This project includes a mandatory approval for your topic at Week 6 and a check-in with the professor on Oct 6th.
- Exams will include a variety of question formats, such as short answers, fill-in, true/false and multiple-choice questions.

VIII. Blackboard

- Blackboard will be used to post video lectures, announcements, handouts, articles, rubrics, deadlines, feedback to quizzes and midterm exams so check this site periodically.
- Lecture slides will be posted on blackboard, however, please do not rely entirely on slides, these are meant as a starting point for note-taking. Class notes and textbook information will form the basis of the material that will be on the exams.

IX. Tentative Schedule

Date	Lecture Topics	Chapter
Aug 22	Introduction	
Aug 24	Evolution Basics	1, 2
Aug 29	Evolutionary Medicine	7
Aug 31	Genetics I	3
Sept 5	Genetics II	3
Sept 7	Development I	4
Sept 12	Development II	4
Sept 14	Development III	4
Sept 19	Life Histories	5
Sept 21	Human Diversity	6
Sept 26	Exam I	
Sept 28	Disease – Reproduction I	8
Oct 3	Disease – Reproduction II	8
Oct 5	Disease – Reproduction III	8
Oct 10	Disease – Nutrition I	9

Oct 12	Disease – Nutrition II	9
Oct 17	Disease – Nutrition III	9
Oct 19	Project check in	
Oct 24	Disease – Defense I	10
Oct 26	Disease – Defense II	10
Oct 31	Disease – Defense III	10
Nov 2	Exam II	
Nov 7	Disease – Mental Health	11
Nov 9	Disease – Mental Health	11
Nov 14	Disease – Cancer	12
Nov 16	Disease – Cancer	12
Nov 21	Project Presentations	
Nov 28	Project Presentations	
Nov 30	Project Presentations	

XI Additional Policies

- A midterm exam can be taken after the specified date ONLY if the student has a documented excuse.
- A request to take a make-up exam must be accompanied by evidence of necessity (ie: athletics letter, interview email...) and must be made 2 weeks prior to the date of the scheduled exam.
- Lecture slides will be posted on blackboard. Class notes and textbook information will form the basis of the material that will be on the exams. If you attend class regularly, you will be updated on the status of lecture notes and course material/announcements.

XII. USC's Statements on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention and Services (RSVP) - (213) 740-9355(WELL), press "0" after hours – 24/7 on call

studenthealth.usc.edu/sexual-assault

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED)- (213) 740-5086 | Title IX – (213) 821-8298

equity.usc.edu, titleix.usc.edu

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following *protected characteristics*: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations. The university also prohibits sexual assault, non-consensual sexual contact, sexual misconduct, intimate partner violence, stalking, malicious dissuasion, retaliation, and violation of interim measures.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298

usc-advocate.symplicity.com/care-report

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

The Office of Disability Services and Programs - (213) 740-0776

dsp.usc.edu

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Support and Advocacy - (213) 821-4710

uscsa.usc.edu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101

diversity.usc.edu

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call

dps.usc.edu

Non-emergency assistance or information.