

USC Dornsife
College of Letters,
Arts and Sciences

HBIO 405 – Evolutionary Medicine (4 units)

Fall 2020

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

Location: online

Professor: Dr. Gioia Polidori

- Office: AHF B40
- Email: gpolidor@usc.edu
- Office Hours: Tuesday and Thursday 11:00-12:30pm + by appointment

For fall 2020, lectures for this class will be taught online.

I. Description of Online Teaching Modality

- Material will be delivered with:
 - asynchronous video lectures (under one hour in total and available prior to the module)
 - in-class activities (under 30 minutes on Tuesday and on Thursday)
 - in-class lecturing segments (under 30 minutes on Tuesday and on Thursday)
- All lectures and activities will be available asynchronously on blackboard.

II. 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.

III. 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.

IV. Prerequisite: BISC 120

V. Required Textbook:

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

VI. Grading Breakdown

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

VII. 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%) | | |

VIII. 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. Exams will be taken remotely using Respondus Monitor and Lockdown Browser.

IX. 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.

X. Tentative Schedule

| Date | Lecture Topics | Chapter |
|---------|--|----------|
| Aug 18 | Module I: Evolution Basics and Evolutionary Medicine | 1, 2 & 7 |
| Aug 20 | | |
| Aug 25 | Module II: Genetics | 3 |
| Aug 27 | | |
| Sept 1 | Module III: Development | 4 |
| Sept 3 | | |
| Sept 8 | Module IV: Life Histories & Human Diversity | 5 & 6 |
| Sept 10 | | |
| Sept 15 | Review and Exam I | 8 |
| Sept 17 | | |
| Sept 22 | Module V: Disease – Reproduction | 8 |
| Sept 24 | | |
| Sept 29 | Module VI: Disease – Nutrition | 9 |
| Oct 1 | | |
| Oct 6 | Check in | |
| Oct 8 | Module VII Disease – Defense part I | 10 |
| Oct 13 | Module VIII: Disease – Defense part II | 10 |
| Oct 15 | | |
| Oct 20 | Review and Exam II | |
| Oct 22 | | |
| Oct 27 | Module IX: Disease – Mental Health | 11 |
| Oct 29 | | |
| Nov 3 | Module X: Disease – Cancer | 12 |
| Nov 5 | | |
| Nov 10 | Project Presentations | |
| Nov 12 | | |
| | Study Days | |
| | Final Exam: See schedule of classes | |

XI Additional Policies

- A midterm exam can be taken after the specified date ONLY if the student has a documented medical excuse.
- A request to take a make-up exam must be accompanied by evidence of necessity (ie: letter from a doctor, 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.symphlicity.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.