

BIEB 152

Evolution of Infectious Diseases

Spring 2023
Syllabus

Basic Course Information

Course website: <https://canvas.ucsd.edu/courses/44877>

Check in several times a week

Ask questions on Piazza: https://piazza.com/ucsd/spring2023/bieb152_sp23_a00/info

Instructor: Prof. Sergey Kryazhimskiy

Please ask general questions on the subject matter or course logistics on Piazza.
If you have individual matters to discuss, please communicate through Canvas

Instructor's Office: Muir Biology Building, #2205

Instructor's Office Hours: Monday 2:15 – 3:30 PM

Instructional Assistants (IA) and their office hours

IA office hours begin on Week 2 (April 10).

First name	Last name	Office hours		Location	Email
		Day	Time		
Baneen	Ali	W	2:30 to 3:30 PM	https://ucsd.zoom.us/j/4738101113	bfali@ucsd.edu
Caesar	De La Fuente	Tu	1 to 2 PM	Outside, east of Muir Biol Bldg	cdelafue@ucsd.edu
Fu-Hsuan	Ko	F	8:30 to 9:30 AM	Art of Espresso	fuko@ucsd.edu
Jayden	Wang	M	5 to 6 PM	https://ucsd.zoom.us/j/99214188499	jzwang@ucsd.edu
Jeannie	Lee	Tu	1 to 2 PM	https://ucsd.zoom.us/j/94612073154	jel025@ucsd.edu
Pranav	Paul	M	4 to 5 PM	Tables outside of York Hall	ppaul@ucsd.edu
Taylor	Forman	Tu	3 to 4 PM	Tata Hall #4601	tforman@ucsd.edu

Lectures:

Lectures will be podcasted but attendance in person is recommended

Lecture	Day	Time	Location
A00	MWF	1:00 PM to 1:50 PM	PETER 110

Discussion sections:

Discussion sections are an important part of the course and **attendance is required**. You will be graded on your participation in the discussion sections. Sections will be devoted to solving problems, answering your questions, and otherwise discussing the material.

Section	Day	Time	Location	IA
A01	M	8:00 PM to 8:50 PM	CENTR 217B	Baneen
A02	Tu	7:00 PM to 7:50 PM	CENTR 220	Caesar
A03	Tu	8:00 PM to 8:50 PM	CENTR 220	Taylor
A04	W	8:00 PM to 8:50 PM	WLH 2208	Jayden
A05	Th	7:00 PM to 7:50 PM	CENTR 220	Caesar
A06	Th	8:00 PM to 8:50 PM	CENTR 220	Jeannie
A07	F	6:00 PM to 6:50 PM	WLH 2115	Fu-Hsuan
A08	F	7:00 PM to 7:50 PM	WLH 2115	Fu-Hsuan
A09	F	10:00 AM to 10:50 AM	APM 2301	Taylor
A10	W	7:00 PM to 7:50 PM	PCYNH 240	Pranav

Course Description

Doctors who treat infectious diseases are faced with a difficult problem since the pathogens they treat often evolve, rendering today's therapies useless tomorrow. Evolution of pathogens has often been overlooked, but the persistence of SARS-CoV-2 or the spread of antibiotic resistance highlight the need to take it into account when developing interventions. This course will provide an introduction into concepts and methods of evolutionary biology, with a view towards applications in disease management. You will learn how viruses and bacteria evolve to escape the immune system, develop resistance against drugs, how they "learn" to infect new hosts, etc. We will also discuss how one can use evolutionary principles to learn about disease origins and to track pathogen spread, how to slow down evolution, and more.

Course goals

- Build a fundamental understanding of concepts and methods in evolutionary biology
- Provide background on disease evolution research and future directions in the field
- Develop analytical skills to evaluate DNA sequences and other data to study the evolution of infectious diseases

Course Prerequisites

1. BILD 3 (Organismic and Evolutionary Biology)

To understand the material in this course, you also need to have a working knowledge of arithmetic and calculus. Please review the following topics before the course starts:

- Fractions
- Operations with exponents and logarithms
- Solving algebraic equations
- Calculating the slope of a line
- Functions

Required Learning Materials

- **iClickers will be necessary. Please bring your iClicker to every lecture or use the iClicker app**
- **Calculators may be helpful sometimes. You can bring a scientific calculator to midterms and the final. No graphical calculators are allowed.**

Optional Learning Materials

All the required material will be covered in class. Periodically we will provide materials online to complement lectures. These reading materials are meant to enhance students' education but are not essential to complete homework or to answer exam questions.

Assessment

Item	Percent
Midterm 1	10 to 15%
Midterm 2	10 to 15%
Final exam	15 to 25%
Homeworks	20 to 35%
Participation in discussion sections	0 to 5 %
Quizzes in class	5%
Extra credit	0 to 5%

Assessments whose percentages are given as ranges can be to some degree substituted for each other, always to the student's advantage. For example, if you are doing very well on participation and homeworks, your final will have less weight. If you did not do very well on midterms, you will have a chance to recuperate some the lost points at the final. What is essential is that by the end of the course you are able to demonstrate certain skills and knowledge in some form of assessment.

Midterms and final

Midterms will be written exams in class, during the regular lecture time. If you are not able to make take a midterm due to legitimate unforeseen circumstances, you will be able to take a makeup **after presenting evidence to the instructor with a valid excuse (e.g., doctor's notice)**. Midterm 1 makeup: May 1 at 4 PM in Muir Biology Building 1138. Midterm 2 makeup: May 31 at 4 PM in Muir Biology Building 1138.

The final will be a written exam. **No makeups will be available.**

Homeworks

Homeworks will be generally due by Friday 2 PM. The exact due date and time will be specified on each homework assignment. Please upload your completed homework to Canvas. **Late turn-ins will not be accepted.**

Homeworks are an essential element of the course. Homeworks will primarily consist of problem sets, but there may also be other assignments. Problems in the exams will be similar to those in the homeworks, but easier. So, if you do well on your homeworks, you will do really well on the exams. You will do well on the homeworks if you attend discussion sections and ask questions.

If you have a clarifying question about the homework, post it on Piazza. Please do not ask for solutions or hints. Legitimate clarifying questions will be answered on Piazza by the instructor or IAs. Inappropriate questions will be deleted.

Participation

In the Discussion sections, you will work with the IAs on problem sets. The IAs will sometimes ask you to come to the board and solve problems. The purpose of these activities is not to test your knowledge, but to help you learn. Every time you come to the board, you get a participation point (up to a total of 5 points max).

Quizzes

We will have a 5-minute iClicker quiz in class **on every Friday** except for the first and the two midterm weeks. Quizzes are designed for the instructor to gauge how you absorb the material, NOT to test your knowledge. Quizzes should be easy. If you feel that you do not know how to solve the problem on the quiz, talk to your IA. Midterms and the final will most certainly have problems that are analogous to those in quizzes.

Extra credit

A number of extra credit (bonus) assignments may be given throughout the course. Bonus problems/assignments may be more difficult than usual. You can earn at most 5 bonus points.

Other Course Policies

- Late turn-ins will generally not be accepted.
- Academic Conduct Policy. Compliance with the general academic conduct policy is expected at all times. Visit the [Office of Academic Integrity](#) (OAI) for more information.

Lecture plan

Check Canvas for the current lecture plan.

Instructor Goals

At a minimum, I hope to pursue the following goals and solicit your open and timely feedback on how well we are meeting these goals:

- Communicate effectively and frequently;
- Be an enthusiastic, active and involved;
- Demonstrate a mastery of the discipline;
- Relate material to current practices;
- Clearly explain complex concepts and ideas;
- Provide a framework for lifelong learning;
- Strive to involve participant in class activities;
- Be available to assist participants in or out of class; and
- Have respect and concern for all participants.

To provide your feedback, you can either talk to the instructor in person during office hours, or relay your feedback through your IA (anonymously, if you wish).