

# BIEB 152

## Evolution of Infectious Diseases

Winter 2024  
Syllabus

Updates are highlighted in yellow

### Basic Course Information

Course website: <https://canvas.ucsd.edu/courses/51339>

Check in several times a week

Ask questions on Piazza: <https://piazza.com/class/lqralpi0u67m6>

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, Room 2205

Instructor's Office Hours: Friday 2:00 – 3:00 PM in Bonner Hall, Room 2140

Instructional Assistants (IAs) and their office hours

Lead IA: Sahana Kuthyar

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

First name	Last name	Office hours		Location	Email
		Day	Time		
Xiaoyu	Gui	Thu	2:00–3:00 PM	Muir 1102	<a href="mailto:xgui@ucsd.edu">xgui@ucsd.edu</a>
Sahana	Kuthyar	Tue	9:00–10:00 AM	<a href="#">Zoom</a> (ID: 94492479043)	<a href="mailto:skuthyar@ucsd.edu">skuthyar@ucsd.edu</a>
Noah Matthew	Nashed	Mon	noon–1:00 PM	HSS 1145L	<a href="mailto:nmnashed@ucsd.edu">nmnashed@ucsd.edu</a>
Mikayla	Tran	Fri	5:00–6:00 PM	Cups Outdoor Cafe ( <a href="#">map</a> )	<a href="mailto:mit013@ucsd.edu">mit013@ucsd.edu</a>
Chong	Wang	Fri	11:00 AM–noon	<a href="#">Zoom</a> (ID: 812 9457 2347 Passcode: BIEB152)	<a href="mailto:chw109@ucsd.edu">chw109@ucsd.edu</a>

## Key dates:

Midterm 1 is on **2 February 2024** (in class)

Midterm 2 is on **4 March 2024** (in class)

Final is on 22 March 2024 (location TBD)

## Lectures and Hands-on Sessions:

Day	Time	Location
Mon		
Wed	1:00 PM to 1:50 PM	GH 242
Fri		

Only about 50% of lectures will be given by the instructor in person. These lectures will be podcasted. The remaining lectures will be recorded and will appear in the Media Gallery on Canvas. We will use these freed-up in-person time slots for “Hands-on Sessions”. These sessions will be devoted to solving problems (sometimes including those from the current homework assignment), answering your questions, and otherwise discussing the material. You will be expected to watch all the recorded lectures prior to the next hands-on-session. **Hand-on sessions are an essential part of the course. These are your main opportunities to interact with the instructor and the IAs.**

## 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.**
- Writing activities will be done in class, especially during the hands-on-sessions, so **please bring paper, pens and/or pencils.**

## Optional Learning Materials

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

## Assessment

### Mandatory

Item	Percent
<a href="#">Midterm 1</a>	25%
<a href="#">Midterm 2</a>	25%
<a href="#">Homework</a>	35%
<a href="#">Quizzes</a>	10%
<a href="#">Participation</a> or <a href="#">Term paper</a>	5%
<b>TOTAL</b>	<b>100%</b>

### Optional

<a href="#">Final exam</a>	25–35%
<a href="#">Extra credit (aka Bonus points)</a>	Up to 5%

## Midterms

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)**.

## Makeups

Midterm 1 makeup: **TBD**

Midterm 2 makeup: **TBD**

## Scope

Midterm 1 will be on topics covered in the first 3-4 weeks of the course. Midterm 2 will be on topics covered in weeks 4–7. Exact scope will be specified during class. Problems on the midterms will be similar to those in quizzes and homework.

## Regrading

See [Regrading policy](#) below.

## Final

The final exam will be optional (opt-in). **If you would like to take the final, you will need to opt-in via the Canvas quiz by the end of Week 9** (exact deadline will be posted in the quiz). If you do not respond to the quiz before the deadline, you will not be taking the final. You can change your choice at any time before the deadline, but you cannot change it after the deadline. In other words, if you opt in for the final, it is mandatory for you to take it. See [below for some guidelines](#) on when you should opt in for the final.

If you do not take the final exam, your grade will be calculated based on all the other assessments. **If you opt-in for the final, your midterms will contribute 12.5% each, all quizzes that you missed will be dropped and the final will constitute the remaining 25 to 35% of your grade.** The final will be a written exam.

## Makeups

No makeups will be available. If you opted in for the final but could not make it because of unforeseen circumstances, you will need to let the instructor know immediately and **present evidence of a valid cause (e.g., doctor's notice)**. Instructor will inform you about possible options.

## Scope

The final will be cumulative. Problems will be similar to those midterms, quizzes and homework.

## Regrading

The final exam will not be returned to you and no regrading will be possible.

## Guidelines for opting-in for the final

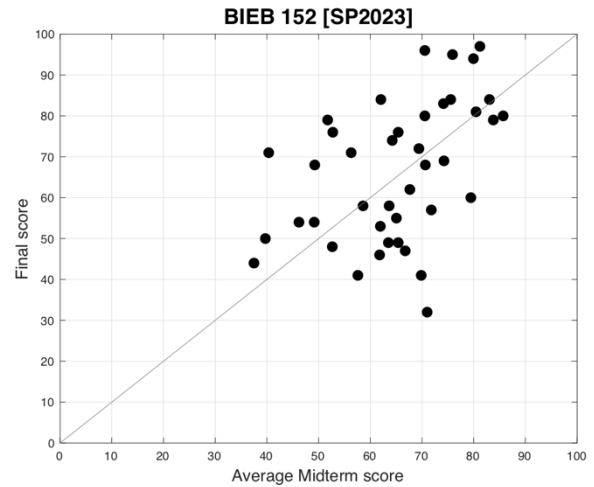
In general, your course grade will not improve by taking the final and may instead decrease. Overall, midterm and final scores are fairly well correlated (see Figure 1), and the final is more difficult because it is cumulative and includes some topics that were not covered in midterms. Thus, you should opt-in to take the final **only if you invested additional time and effort into studying for this course** and feel that you can perform significantly better on the final than on the midterms. For example, if there were some extenuating circumstances that prevented you from doing well on one of the midterms (e.g., you were sick and could not study), but you were able to catch up, then your grade can improve by taking the final. **If you did not invest extra time and effort, there is no point in taking the final.** Doing so would not improve your grade (see Figure 2) and would impose unnecessary additional work on yourself, IAs and the instructor.

## Homework

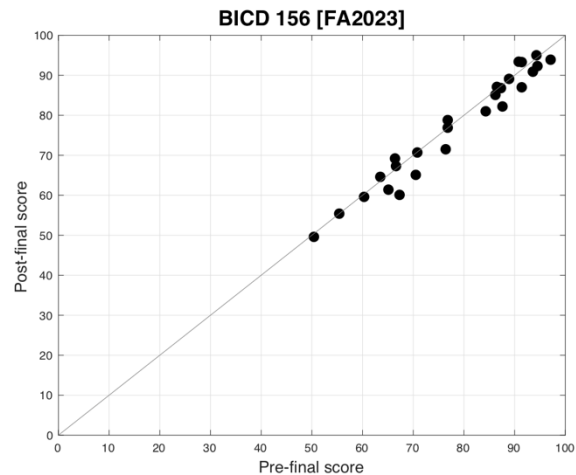
**Submit your homeworks electronically via GradeScope** by the date/time specified on the homework itself. There will be a 4-hour grace period after the deadline with no penalty. **Turn-ins after the grace period will not be accepted.** The lecture plan gives an approximate timeline for all homework assignments. **Check each homework assignment for the exact deadline.**

Homework assignments are an essential element of the course. They will primarily consist of problem sets, but there may also be other assignments. Problems in the exams will be similar to those in the homework, but generally easier. So, if you do well on your homework, you will do well on the exams. You will do well on the homework if you attend Hands-on-Sessions 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.



**Figure 1. Correlation between midterm and final scores in BIEB 152 [SP2023].**



**Figure 2. Correlation between midterm and final scores in BICD 156 [FA2023], where the same grading system was implemented.**

## Quizzes

We will have a 5-minute iClicker quiz in class **on every Monday** except for the first week and the two midterm weeks. Quizzes will be on the material covered during the previous week. **No makeups are available for missed quizzes, even if you have a valid excuse.** **The only way to make up the points for missed quizzes is to take the final (see [Final](#) for details).**

## Participation

During lectures and hands-on sessions, there will be opportunities to interact with the instructor and IAs, including individual and group exercises, problem solving on the board and answering questions. The purpose of these activities is not to test your knowledge, but to help you learn actively. Every time you participate in one of those activities, you get a full or half participation point, depending on the difficulty of the activity. One-one interactions with the instructor or IA do not earn you participation points. You can earn up to a total of 5 participation points max for the whole course. **Each full participation point is worth 1% of the final grade.**

## Term paper

Instead of or in addition to earning participation points, you can submit a term paper. The specifics for this assignment and the rubric will be provided during the course. The term paper will be worth  $(5 - PP)$  where PP is the number of participation points you earned during the entire course.

## Extra credit

A number of extra credit (bonus) assignments may be given throughout the course. Bonus problems/assignments may be more difficult than usual. Extra credit points are added on top of your regular grad and each bonus point (BP) is worth 1% point of the final grade. For example, if your final grade on all the mandatory evaluations is 95% and you got 4 BPs, your final grade will be 99%. You can earn at most 5 BPs.

## Regrading policy

We will do our best to ensure that all grades are assigned according to a common rubric and no grading mistakes are made. However, such mistakes do happen. If you think that there was a grading mistake in your midterm or HW, **submit a regrade request to the Lead IA (Sahana Kuthyar).**

### Regrading rules:

- **The deadline for regrade requests is 3 days after the midterms/HW have been handed out to the majority of the class.** Regrade requests after the deadline will not be accepted.
- To submit a regrade request, send a Canvas or email message to the Lead IA attaching (i) the scan/photo of **the whole exam/HW** and (ii) a brief description of the

issue/issues the grading mistake. The Lead IA will redirect your request to the appropriate grader or escalate it to the instructor if necessary.

- If you seek to correct an apparent grading inconsistency between you and another student, submit (i) a scan/photo of **both entire** exams/HWs and (ii) a brief explanation of what you think the problem is.
- Whenever you submit a regrading request for a particular problem, **the whole problem** will be regraded. The instructor reserves the right to regrade **the entire exam/HW**.
- All regrade requests will be addressed, but these requests will not be high priority due to severe time constraints.

## Conversion from percentages to letter grades

Your percentage, $x$	Your letter grade
$x \geq 97$	A+
$93 \leq x < 97$	A
$90 \leq x < 93$	A-
$87 \leq x < 90$	B+
$83 \leq x < 87$	B
$80 \leq x < 83$	B-
$77 \leq x < 80$	C+
$73 \leq x < 77$	C
$70 \leq x < 73$	C-
$67 \leq x < 70$	D+
$60 \leq x < 67$	D
$x < 60$	F

## 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).