

BI 326 | Immunology and Infectious Disease

Winter 2022

Time and Location:

- Lecture: Tuesdays and Thursdays 12:00 - 1:20 PM, 32 Tykeson Hall
- Discussion: Fridays 10:00 - 10:50 AM, 11:00 - 11:50 AM, 12:00 - 12:50 PM, or 1:00 - 1:50 PM, 129 Huestis Hall

Professor: Matthew Barber, Ph.D.

- Email: mfb barber@uoregon.edu
- Office hours: Tuesdays and Thursdays, 1:30 - 2:00 PM, 321 Pacific Hall (and via Zoom)

GE: Clara Rehmann

- Email: crehmann@uoregon.edu
- Office hours: TBD

GE: Patrick Horve

- Email: pfh@uoregon.edu
- Office hours: TBD

Course Description: In this course we will explore how immune systems function to prevent infection and how disease-causing microorganisms counteract the immune system to cause disease. We will focus primarily on the molecular, cellular, and genetic basis of infection and immunity. Examples will be drawn largely from human biology, while also covering fundamental concepts relevant to diverse animals and plants. Topics include innate and adaptive immunity, cells of the immune system, vaccines, antibiotics, and immune-based therapies. Content in this course will be delivered through a combination of readings, remote and in-class lectures, active learning activities, quizzes, as well as a poster project where students will research and present on an infectious disease of their choice. For Biology majors, this course satisfies the upper division Area I (Cell/Molecular Biology) requirement.

Expected Learning Outcomes. Upon completing this course, students will be able to:

1. Determine how molecular, cellular, and genetic processes contribute to immune system functions.
2. Predict mechanisms that pathogenic microbes use to counteract the immune system and cause disease.
3. Evaluate how medical interventions including vaccines, antibiotics, and immunotherapy function to prevent and treat disease.
4. Draw connections between immune functions and the features of infectious and inflammatory disease.
5. Synthesize and evaluate primary research literature in the fields of immunology and infectious disease.
6. Communicate and critique research in the area of immunology and infectious disease through writing and poster presentation.

Estimated Student Workload: Students in this course will attend two 90-minute classes per week as well as a 50 minute discussion section led by a GE. Class periods will include lectures, group

discussions, and working through practice problems. In preparation for each class, students will be responsible for listening to recorded lectures and answering quiz questions posted on Canvas. It is expected that preparation for class and discussion section will take several hours each week. The instructor will also be available an hour per week during office hours to review concepts from class. Two midterm exams will be administered during the term. In addition, students will choose an infectious disease of their choice for an abstract and final poster project. The abstract will consist of a ~2 page written summary (as well as cited references) providing background on the disease. The final poster will be prepared and presented by students during the two final class periods in week 8. In addition, a final exam will be given during finals week modeled after the two midterm exams.

Prerequisites: BI 214 or BI 282H

Evaluation:

1. Canvas quizzes before class (15%)
 - Students will be provided with recorded lectures via Canvas, after which they will answer a series of questions based on the lecture content due before each class period.
2. Discussion session assignments (5%)
 - Attendance and completion of assignments in discussion section each week will contribute 10% to a student’s final grade. Discussion section topics will vary by week, but include reading and evaluating primary literature articles related to course content.
3. Midterm exams (30% total)
 - Midterm exams will be provided in class during weeks 3 and 6. The lowest of these four grades will be dropped from a student’s final score. Exams will include a mixture of multiple choice, true-false, and long answer questions.
4. Abstract on poster topic (5%)
 - Students will pick an infectious disease of interest. A 1-2 page summary introducing the pathogenic microbe and features of the disease will be submitted mid-way through the term. This assignment will also contain a list of literature citations. This assignment is intended to provide a foundation from which students will complete their final poster.
5. Poster presentation (20%)
 - Students will design and print a poster on their disease of interest. The poster will contain both text descriptions and summaries as well as illustrations and figures to depict features of the pathogen biology, disease progression, and how the microbe interacts with the immune system. A portion of the grade for this project will involve individual student presentations during week 8 in an open-forum poster session.
6. Final exam (25%)
 - A cumulative exam modeled after the biweekly exams will be administered during finals week.

Grade	Percent
A+	97.0-100%
A	93.0-96.9%
A-	90.0-92.9%
B+	87.0-89.9%
B	83.0-86.9%
B-	80.0-82.9%
C+	77.0-79.9%
C	73.0-76.9%
C-	70.0-72.9%
D+	67.0-69.9%
D	60.0-66.9%
F	0-59.9%

Note: your lowest Discussion session grade as well as your lowest two Canvas quizzes will be dropped from your final score. Therefore if you miss a week of class due to illness or other issues, you can still receive up to full credit in the course.

How grades will be determined: This course follows the standard University of Oregon grading system (<https://registrar.uoregon.edu/current-students/grading-system#grade-chart>). The chart at right provides a breakdown by percentage.

General policy on missed assignments: Assignments must be turned in on time. The grading system is designed to allow some flexibility if you miss class or a homework assignment. If you anticipate an extended absence please contact the instructor. There will be no opportunities for extra credit. Please do not ask for exceptions.

Email: Please include “BI 326” in the subject line, so your email can be attended to in time. I will try to answer your email in a timely manner; however I do not often check our email in the evenings or during weekends.

Website: Syllabus, course materials, quiz questions, tests, assignments, and grades will be posted to the course Canvas site.

Textbook: No textbook is required for this course. Online readings will be provided to supplement recorded and live lectures. An optional textbook should be available through the Duck Store and at the library: Punt, J.; Stranford, S. A.; Jones, P. P.; Owen, J. A. *Kuby Immunology, Eighth.*; Macmillan Education: New York, 2019.

Required supplies: personal computer with internet access.

COVID procedures and attendance: In the event of a campus emergency that disrupts academic activities, course requirements, deadlines, and grading percentages are subject to change. Information about changes in this course will be communicated as soon as possible by email, and on Canvas. If we are not able to meet face-to-face, students should immediately log onto Canvas and read any announcements and/or access alternative assignments. Students are also expected to continue coursework as outlined in this syllabus or other instructions on Canvas. In the event that the instructor of this course has to quarantine, this course may be taught online during that time.

While UO has currently transitioned back to in-person instruction, the pandemic presents ongoing barriers and risks to students and staff. As such, I have decided that **in-class attendance will not contribute to students grades this term.** My current plan is to record in-class sessions via Zoom and post them to Canvas. I will also hold office hours concurrently in person and via Zoom. This plan may be subject to change particularly in the first weeks of the term.

Good Classroom Citizenship

1. Wear your mask and make sure it fits you well
2. Stay home if you're sick
3. Get to know your neighbors in class, and let them know if you test positive
4. Get tested regularly
5. Watch for signs and symptoms with the daily symptom self-check
6. Wash your hands frequently or use hand sanitizer
7. Complete the UO COVID-19 case and contact reporting form if you test positive or are a close contact of someone who tests positive.

Schedule:

Week	Date	Subject	Optional Reading
1	Jan. 4	Course logistics, immunology overview	Kuby Ch. 1 pg. 12-21 (Fig. 1-5 to 1-7)
1	Jan. 6	Intro to pathogens	Alberts reading
2	Jan. 11	Cells and tissues of the immune system	Kuby Ch. 2 pg. 31-47 (until Primary Lymphoid Organs)
2	Jan. 13	Immune receptors	Kuby Ch. 3 pg. 75-90 (Fig. 3-7 - Table 3-2)
3	Jan. 18	Immune signaling	Kuby Ch 3 pg. 99-109 (Fig. 3-22 - end of Ch. 3)
3	Jan. 20	Midterm 1	
4	Jan. 25	Innate immunity	Kuby Ch. 4 pg. 113-120 (until Box 4-1), skim 121-144 (until Fig. 4-21)
4	Jan. 27	The complement system Poster Abstract Due	Kuby Ch. 5 pg. 165 - 180 (until table 5-4), skim rest of Ch. 5
5	Feb. 1	VDJ recombination	Kuby Ch. 6 pg. 205-225 (until Fig. 6-12)
5	Feb. 3	MHC and antigen presentation	Ch. 7 pg. 249 - 259 (until Table 7-2), 275 - 282 (Fig. 7-11 - 7-17)
6	Feb. 8	T cells	Kuby Chapter 10 pg. 353 - 371 (until Fig. 10-10)
6	Feb. 10	Midterm 2	
7	Feb. 15	B cells	Kuby Ch. 11 pg. 391 - 401 (until Fig. 11-9), 413 - 417 (Fig. 11-18 - 11-20)
7	Feb. 17	Cell-mediated immunity	Kuby Ch. 12 pg. 448-468 (Cell-Mediated Effector Responses)
8	Feb. 22	Poster Presentations	
8	Feb. 24	Poster Presentations	
9	March 1	Vaccines	Kuby Ch. 17 pg. 662-676 (Vaccines)
9	March 3	Barrier immunity	Kuby Chapter 13 pg. 473-487 (until Fig. 13-7). Skim pg. 500-508.
10	March 8	Antibiotics	Blair review
10	March 10	Tolerance and autoimmunity	Kuby Chapter 16, 593-617 (until Transplantation Immunology)
11		Final Exam	-

Succeeding in this course: This course is designed for students who have completed the introductory biology series and builds on concepts of molecular biology, cell biology, and genetics. I believe each of you who meets these requirements has the potential to succeed in this course. Here are my best recommendations for success:

- **Keep up with the video lectures, readings, and Canvas questions.** Class time will be spent building from content in the video lectures and readings, so it's important arrive in class prepared. Canvas questions are worth a significant amount of your grade, so do the questions! If you watch the lectures and do any supplemental readings, the questions should not take much time. However, answering questions without doing the reading will leave you unprepared for tests and exams.
- **Engage during class and in discussion sections.** Clicker questions and other in-class activities are meant to prepare you for the kinds of questions you will find on the exams, so coming to class and engaging with the material will help your performance.
- **Focus on the big picture and connecting content throughout the course.** Some amount of memorization will be necessary, but midterms will aim to test your ability to apply what you know in new ways. Don't get too bogged down in the details of weekly readings.
- **Prepare early.** Assignments, particularly the poster, will take time. Put in the effort early so you don't need to cram at the last minute.

If you follow these guidelines, I am confident you will succeed in (and hopefully enjoy) this course. Ultimately this course should provide you with a great foundational knowledge of immunology and mechanisms of infectious disease.

Etiquette: Please arrive on time. Lectures and discussions begin promptly on the hour. Please listen to instructions and do not speak while the instructor or a classmate is speaking.

Academic Integrity: You are expected to do your own work on homework, class presentations, and papers. Academic misconduct, including cheating and plagiarism, will not be tolerated. You are encouraged to discuss ideas with other students and study together, but do not copy someone else's work or allow anyone to copy yours. All students are expected to conform to the Student Conduct Code. Please note that Instructors are required to file a written report of any academic misconduct with the Director of Student Conduct and Community Standards.

Inclusive Learning: In this class we aim to build an inclusive learning environment. We understand that our members represent a rich variety of backgrounds and perspectives. We are committed to providing an atmosphere for learning that respects diversity. While working together to build this community we ask all members to:

- be open to the views of others.
- honor the uniqueness of their classmates.
- appreciate the opportunity that we have to learn from each other.
- value each other's opinions and communicate in a respectful manner.
- keep confidential discussions that the community has of a personal (or professional) nature.

Classroom courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the students' legal names. We will gladly honor your request to address you by an alternate name or gender pronoun. Please advise us of

this preference early in the quarter (or before) so that we may address you properly.

Students with disabilities: The University of Oregon is working to create inclusive learning environments. Please notify me if there are aspects of the instruction or design of this course that result in disability-related barriers to your participation. You are also encouraged to contact the Accessible Education Center in 360 Oregon Hall at 541-346-1155 or uoaec@uoregon.edu.

Discrimination and Harassment

Prohibited Discrimination and Harassment Reporting

Any student who has experienced sexual assault, relationship violence, sex or gender-based bullying, stalking, and/or sexual harassment may seek resources and help at safe.uoregon.edu. To get help by phone, a student can also call either the UO's 24-hour hotline at 541-346-7244 [SAFE], or the non-confidential Title IX Coordinator at 541-346-8136. From the SAFE website, students may also connect to Callisto, a confidential, third-party reporting site that is not a part of the university.

Students experiencing any other form of prohibited discrimination or harassment can find information at respect.uoregon.edu or aaeo.uoregon.edu or contact the non-confidential AAEO office at 541-346-3123 or the Dean of Students Office at 541-346-3216 for help. As UO policy has different reporting requirements based on the nature of the reported harassment or discrimination, additional information about reporting requirements for discrimination or harassment unrelated to sexual assault, relationship violence, sex or gender based bullying, stalking, and/or sexual harassment is available at [Discrimination & Harassment](#).

Specific details about confidentiality of information and reporting obligations of employees can be found at titleix.uoregon.edu.

Reporting

As the instructor of this course I am a Student Directed Employee. As such, **if you disclose to me, I will respond to you with respect and kindness. I will listen to you, and will be sensitive to your needs and desires. I will not judge you. I will support you.** As part of that support, I will direct students who disclose sexual harassment or sexual violence to resources that can help. **I will only report the information shared to the university administration when you as the student requests that the information be reported** (unless someone is in imminent risk of serious harm or is a minor). Please note the difference between 'privacy' and 'confidentiality.' As a Student Directed Employees I can offer privacy because I am not required to report certain information to the university. However, I cannot be bound by confidentiality in the same way that a counselor or attorney is. Confidential resources such as these means that information shared is protected by federal and state laws. Any information that we as student-directed employees receive may still be accessed by university or court proceedings. This means, for example, that I could still be called as a witness or required to turn over any related documents or notes that I keep. Please note also that we are required to report all other forms of prohibited discrimination or harassment to the university administration.

Mandatory Reporting of Child Abuse

UO employees, including faculty, staff, and GEs, are mandatory reporters of child abuse. This statement is to advise you that your disclosure of information about child abuse to the instructor may trigger my duty to report that information to the designated authorities. Please refer to the following links for detailed information about mandatory reporting: [Mandatory Reporting of Child Abuse and Neglect](#).

Safe Ride

541-346-7433 ext 2

pages.uoregon.edu/saferide

Safe Ride is an **assault prevention shuttle** that works to provide free, inclusive, and accessible alternatives to traveling alone at night for **UO students, faculty, and staff**.

We are a schedule-ahead service and riders can (1) call once we open to schedule a ride with a dispatcher or (2) leave a voicemail on the day of their ride request. We do not call riders ahead of time to confirm due to capacity constraints, but riders are always welcome to call us to double-check that their ride was scheduled. We are a feminist, 'for-the-students/by-the-students' organization and operate out of the Women's Center in EMU 12F.

Operating hours:

Spring term Sunday - Thursday | 7p - midnight

Friday + Saturday | 7p - 2a

Summer term Sunday - Thursday | 9p - midnight

Friday + Saturday | 9p - 2a

Fall/Winter term Sunday - Thursday | 6p - midnight

Friday + Saturday | 6p - 2a

Policy and rules:

1. We are a **schedule-ahead service**, we **do not call ahead**, and we can only wait for riders for 5 minutes at their pick-up time and location.
2. We only give rides to groups of **3 or less** to prioritize groups that are at higher risk.
3. We are a **free service** and do not accept tips.