

BIO 6060: Microbiology and Immunology

3 units

Summer 2025

Meeting days/times: MW 6:00-9:00 PM

Meeting location: Sator Hall 105

Final Exam: 8/20/25 6:00 PM (at-home)

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PLNU Mission

To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Course Description

Concepts in microbiology, including the diversity and ecology of microscopic organisms, and in immunology, focusing on cellular and molecular regulation of the immune system in health and disease, are addressed from the perspective of teaching for conceptual understanding. Lecture and lab. Letter grade.

Program and Course Learning Outcomes

Candidates who complete the Master of Science in General Biology program will be able to:

1. Discuss major concepts and theories in biology;
2. Carry out and communicate various experimental methods and types of data analysis;
3. Demonstrate knowledge and skills in critical thinking, such as analysis and synthesis, as applied to primary literature in the field of biology, as well as in science education or science leadership; and
4. Distinguish between science and faith, and recognize the potential compatibility of the two domains.

Upon course completion, you will be able to:

- a) discuss major concepts and theories relevant in the study of microbiology and immunology. (PLO 1)
- b) articulate the persistent challenges faced by scientists in microbiology and immunology. (PLO 1)

- c) demonstrate both an ability to perform, and an understanding of, experimental methods and data analysis used in the study of microbiology and immunology. (PLO 2)
- d) access and use databases, simulations and/or journals related to microbiology and immunology. (PLO 2)
- e) analyze representative research papers in microbiology and immunology. (PLO 3)
- f) examine the science/faith relationship in the context of microbiology and immunology. (PLO 4)

Required Texts and Recommended Study Resources

Students are responsible to have the required course textbooks prior to the first day of class. Students are also encouraged to begin reading the books in preparation for the class as soon as possible.

1. **Required:** Brock Biology of Microorganisms (ISBN-13: 9780134874401 (2020 update) by Madigan, Bender, Buckley, Sattley, Stahl. You may rent the eBook for \$8.49/mo at <https://www.pearson.com/en-us/subject-catalog/p/brock-biology-of-microorganisms/P200000006867/9780135860717>. Select the eTextbook on Pearson+ option.
2. **Recommended:** The Immune System, 4th or 5th edition by Peter Parham

Course Credit Hour Information

In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 3-unit class delivered over 7 weeks. Specific details about how the class meets the credit hour requirement can be provided upon request.

Assessment and Grading

Assignment Distribution by Percentage:

2 Lab reports	10%
Research Article Analysis	50%
Presentation	10%
Final Exam	30%

Grading Scale:

A=93-100	B-=80-82	D+=67-69
A-=92-90	C+=77-79	D=63-66
B+=87-89	C=73-76	D-=60-62
B=83-86	C-=70-72	F=0-59

Trigger Warning

We acknowledge that each of you comes to PLNU with your own unique life experiences. This contributes to the way you perceive several types of information. In BIO 6060, we will cover a variety of topics, some of which you may find triggering. These topics include vaccines. Each time this topic appears in a reading or unit, it is marked on the syllabus. The experience of being triggered versus intellectually challenged are different. The main difference is that an individual must have experienced trauma to experience being triggered, whereas an intellectual challenge has nothing to do with trauma. If you are a trauma survivor and encounter a topic in this class that is triggering for you, you may feel overwhelmed or panicked and find it difficult to concentrate. In response, we encourage you to take the necessary steps for your emotional safety.

This may include leaving class while the topic is discussed or talking to a therapist at the Counseling Center. Should you choose to sit out on discussion of a certain topic, know that you are still responsible for the material; but we can discuss if there are other methods for accessing that material and for assessing your learning on that material. Class topics are discussed for the sole purpose of expanding your intellectual engagement in the areas of Microbiology and Immunology and we will support you throughout your learning in this course.

PLNU Copyright Policy

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU Recording Notification

In order to enhance the learning experience, please be advised that this course may be recorded by the professor for educational purposes, and access to these recordings will be limited to enrolled students and authorized personnel.

Note that all recordings are subject to copyright protection. Any unauthorized distribution or publication of these recordings without written approval from the University (refer to the Dean) is strictly prohibited.

PLNU Academic Honesty Policy

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. For all student appeals, faculty and students should follow the procedures outlined in the University Catalog. See [Graduate Academic and General Policies](#) for definitions of kinds of academic dishonesty and for further policy information.

During the first week of class, you will be asked to submit an Academic Honesty Verification Statement. Submitting the statement is a requirement of this course. By submitting the Academic Honesty Verification Statement, you will be verifying all assignments completed in this course were completed by you. Carefully review the Academic Honesty Statement below.

Statement: "In submitting this form, I am verifying all the assignments in this course will be completed by me and will be my own work."

Artificial Intelligence (AI) Policy

You are allowed to use Artificial Intelligence (AI) tools (e.g., ChatGPT, Gemini Pro 2.5, GrammarlyGo, Perplexity, etc.) to generate ideas, but you are not allowed to use AI tools to generate content (text, video, audio, images) that will end up in any work submitted to be graded for this course. If you have any doubts about using AI, please gain permission from the instructor.

PLNU Academic Accommodations Policy

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities in accordance with the Americans with Disabilities Act (ADA). Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu or 619-849-2533). Once a student's eligibility for an accommodation has been determined, the EAC will work with the student to create an Accommodation Plan (AP) that outlines allowed accommodations. Professors are able to view a student's approved accommodations through Accommodate.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course. Accommodations are not retroactive so clarifying with the professor at the outset is one of the best ways to promote positive academic outcomes.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC. Students cannot assume that because they had accommodations in the past, their eligibility at PLNU is automatic. All determinations at PLNU must go through the EAC process. This is to protect the privacy of students with disabilities who may not want to disclose this information and are not asking for any accommodations.

Language and Belonging

Point Loma Nazarene University faculty are committed to helping create a safe and hospitable learning environment for all students. As Christian scholars we are keenly aware of the power of language and believe in treating others with dignity. As such, it is important that our language be equitable, inclusive, and prejudice free. Inclusive/Bias-free language is the standard outlined by all major academic style guides, including MLA, APA, and Chicago, and it is the expected norm in university-level work. Good writing and speaking do not use unsubstantiated or irrelevant generalizations about personal qualities such as age, disability, economic class, ethnicity, marital status, parentage, political or religious beliefs, race, gender, sex, or sexual orientation. Inclusive language also avoids using stereotypes or terminology that demeans persons or groups based on age, disability, class, ethnicity, gender, race, language, or national origin. Respectful use of language is particularly important when referring to those outside of the religious and lifestyle commitments of those in the PLNU community. By working toward precision and clarity of language, we mark ourselves as serious and respectful scholars, and we model the Christ-like quality of hospitality.

If you (or someone you know) have experienced other forms of discrimination, you can find more information on reporting and resources at www.pointloma.edu/nondiscrimination.

Sexual Misconduct and Discrimination

In support of a safe learning environment, if you (or someone you know) have experienced any form of sexual discrimination or misconduct, including sexual assault, dating or domestic violence, or stalking, know that accommodations and resources are available through the Title IX Office at pointloma.edu/Title-IX. Please be aware that under Title IX of the Education Amendments of 1972, faculty and staff are required to disclose information about such misconduct to the Title IX Office.

If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact Counseling Services at counselingservices@pointloma.edu or find a list of campus pastors at pointloma.edu/title-ix or as shown in the PLNU Spiritual Care section of this syllabus.

If you (or someone you know) have experienced other forms of discrimination or bias, you can find more information on reporting and resources at www.pointloma.edu/bias

PLNU Attendance and Participation Policy

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. Therefore, regular attendance and participation in each course are minimal requirements.

If the student is absent for more than 10 percent of class sessions, the faculty member will issue a written warning of de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university withdrawal date or, after that date, receive an “F” grade.

Students who anticipate being absent for an entire week of a course should contact the instructor in advance for approval and make arrangements to complete the required coursework and/or alternative assignments assigned at the discretion of the instructor. Acceptance of late work is at the discretion of the instructor and does not waive attendance requirements.

Refer to [Academic Policies](#) for additional detail.

Synchronous Attendance/Participation Definition

For synchronous courses that have specific scheduled meeting times (including in-person, hybrid, and synchronous online courses), absences are counted from the first official meeting of the class regardless of the date of the student’s enrollment. For courses with specific attendance requirements, those requirements are outlined in the course syllabus.

Online Asynchronous Attendance/Participation Definition

Students taking online courses with no specific scheduled meeting times are expected to actively engage throughout each week of the course. Attendance is defined as participating in an academic activity within the online classroom which includes, but is not limited to:

- Engaging in an online discussion
- Submitting an assignment
- Taking an exam
- Participating in online labs
- Initiating contact with faculty member within the learning management system to discuss course content

Note: Logging into the course does not qualify as participation and will not be counted as meeting the attendance requirement.

Use of Technology

In order to be successful in the online or hybrid environment, you'll need to meet the minimum technology and system requirements; please refer to the [Technology and System Requirements](#) information.

Additionally, students are required to have headphone speakers, microphone, or webcams compatible with their computer available to use. Please note that any course with online proctored exams requires a computer with a camera (tablets are not compatible) to complete exams online.

Problems with technology do not relieve you of the responsibility of participating, turning in your assignments, or completing your class work.

GPS Academic Resources

PLNU offers the following free academic resources virtually for Graduate Professional Studies (GPS) Students. Visit myPLNU through the links below for more information.

- **The GPS Writing Center** offers:
 - **Zoom Writers Workshops** offered each quad on a variety of helpful topics
 - **One-to-one appointments** with the Writing Coach
 - **Microlearning YouTube Video Library** for helpful tips anytime
 - **Research Help Guide** to help you start your research
 - The physical office is located on the third floor of the **Mission Valley Regional Center** off the student lounge
- **Academic Writing Resources Course**: Found on your Canvas Dashboard, this course is non-credit with 24/7 access, no time limits, and self-paced content. **Watch a quick video run-through** and take time now to explore!
- **Grammarly**: Students have unlimited FREE access to Grammarly for Education, a trusted tool designed to help enhance writing skills by providing real-time feedback, identifying areas for improvement, and providing suggestions. Grammarly's Generative AI is NOT available with our student accounts.
- **Tutoring**: Students have access to 24/7 live or scheduled subject tutoring through Tutor.com, including a Paper Drop-Off Service with feedback within 12 hours.

We are here to support you! Contact us anytime: GPSWritingCenter@pointloma.edu

Schedule At-A-Glance

Schedule is tentative and is subject to change. Any changes will be indicated on Canvas.

Week	MON		WED	
1	7/7	Lecture Lab	7/9	Lecture Lab
2	7/14	Lecture	7/16	Lecture
3	7/21	Lecture Lab	7/23	Lecture Lab
4	7/28	Lab	7/30	Presentations Lecture
5	8/4	Lecture	8/6	Lecture
6	8/11	Lecture	8/13	Lecture
7	8/18	Lecture	8/20	Lecture

shaded boxes represent times we will meet in person

Microbiology Lab Safety Guidelines

1. Wash your hands regularly with warm water and soap. Hands should be washed upon entering the lab and before exiting the lab, at the very least. It is a good idea to wash your hands occasionally during the lab as well, especially if you suspect that they have been contaminated.

2. Benchtops should be disinfected routinely at the beginning and end of lab and anytime during lab that you suspect surface contamination.
3. Clothing and footwear must be appropriate for laboratory work.
 - a. Long-hanging necklaces, bulky jewelry, and excessive and bulky clothing (including long sleeves that extend beyond the wrist, ties, coats, baggy pants, and sweaters) should not be worn in the laboratory or prep rooms. Long hair must be tied back during your shift.
 - b. **Closed-toe shoes that cover the entire foot (including the heel).**
 - c. **Pants** that cover down to and over ankles (or socks must cover ankles), so that there is **no skin visible between the pants and shoes.**
 - d. **Shirts must cover** the shoulders, chest, and stomach completely, **without having to constantly readjust.** You are encouraged to wear long sleeves to maximize protection.
 - e. You may not work in the laboratory or classrooms without the proper attire.
 - f. Because of the nature of the job, it is best not to wear your favorite or nicer clothes.
4. Bacterial cultures, living or dead, pathogenic or not, must be handled with gloves.
5. Be sure all cuts are properly covered/bandaged.
6. Alert the instructor to any illnesses, medications, and compromises to your immune system. Ask your doctor if you are unsure.
7. Handle Bunsen burners with caution. Alert your benchmates when a burner has been lit. Secure loose clothing (such as frilly sleeves). Turn off burners when not in use or when you are leaving the lab, evenly temporarily.
8. Hair that is longer than shoulder-length must be tied back.
9. Break yourself of the habit of touching your face with your hands. You should not rub your eyes or touch your mouth or nose during lab.
10. Absolutely no food or drink in the lab, even temporarily. If you want to bring snacks or a drink to lab and leave it in the hallway, be sure to be aware of what you've touched and what may be on your hands before you take a break to eat or drink.
11. BIOHAZARD BIN: Dispose of all contaminated disposable materials in the biohazard waste bin. Do not place glass or other sharps in this bin. Never reach into a biohazard bin to retrieve something. Liquids should not be placed in this container. All gloves, contaminated or not, should be disposed into the biohazard bin. All disposable plates, pipettes, pipette tips, gloves, etc. that have come into contact with any culture, pathogenic or otherwise, must be disposed in a biohazard bin.
12. AUTOCLAVE TUB: Dispose of all re-useable supplies such as glass test tubes in the autoclave tub. Place anything that requires sterilization before disposal in this container, such as tubes with live cultures, or microscope slides prepared with live cultures.
13. SHARPS BOX: Only uncontaminated sharps should be placed in the sharps box. Contaminated sharps (for example, microscope slides that you prepared with a live culture), must be autoclaved before being placed in this container.
14. REGULAR TRASH CAN: Only uncontaminated, disposable, non-sharps can be placed in the regular trash can. No sharps, no cultures, no contaminated materials, and no re-useable materials should be placed in the regular trash can.
15. Do not dump any live culture down the drain. All cultures must be autoclaved before being dumped. Place cultures in the autoclave tub.
16. On the first day of lab, locate the first aid kit, fire extinguisher, safety shower, and eye wash stations.
17. If you spill a culture on the floor or lab bench, make others aware of the spill and notify the instructor or lab assistant immediately. Spills will be cleaned and disinfected.
18. If you spill a culture on yourself, notify the instructor or lab assistant immediately.

19. If a chemical or culture splashes into your eyes, have a labmate help you to use the eye wash station immediately. Flush eyes for at least 5 minutes. Ask another student to notify the instructor or lab assistant.
20. Do not attempt to clean up broken glass. Notify the instructor or lab assistant immediately.
21. If you are injured in any way, big or small, notify the instructor or lab assistant immediately.
22. Do not remove any culture, reagent, or other material/supplies from the lab at any time.

*Conscientious behavior will mitigate many safety hazards in the lab.