



Biology Department- School of S.T.E.M.

**BIO3090 and BIO3090L- Immunology and Immunology Lab**

4 units (3 units lecture + 1 unit lab)

*Spring 2026*

**Meeting Days, Times, and Locations:**

Lecture: Mon & Wed, 4-5:15pm in Latter 102

Lab: Thurs, 8-11am in Sator 120

**Final Exam: Monday, 5/4/26, 4:30-7pm**

INFORMATION	SPECIFICS FOR THE COURSE
<b>Instructor title and name:</b>	Becca Salgado, M.S.
<b>Phone:</b>	949-933-6795
<b>Email:</b>	bsalgado@pointloma.edu
<b>Office location and hours:</b>	Biology adjunct office in Rohr Science W: 10:30 am – 12 pm (In person) Th: 12-1:30 pm (In person)  Or email me for an appointment

**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**

BIO3090 (3): Introduction to the immune system with an emphasis on mammalian models. The course focuses on the cellular and molecular regulation of the immune system in health and disease. Topics

include recognition of antigen, development of lymphocyte repertoires, and innate and adaptive immune responses. Also included are discussions of the immune system's responses to cancer cells, tissue transplants, and allergenic substances.

BIO3090L (1): An inquiry-based laboratory that is a co-requisite for BIO3090. Letter graded.

### **Program and Course Learning Outcomes**

Students will be able to:

1. Analyze the genetics, biochemistry, cellular biology, and developmental biology of the immune system.

*Note: For those of you who have taken Advanced Cell Biology, you will find some common themes emerging in Immunology, namely cell compartments and vesicular traffic, endocytosis/phagocytosis, cell signaling, cytoskeletal reorganization, and apoptosis.*

2. Analyze the ways in which the components of the immune system interact to protect organisms from disease.
3. Analyze diseases of the immune system.
4. Conduct immunology research, including designing and conducting at least one independent investigation.
5. Analyze data, formulate conclusions, and design a follow-up experiment for each lab investigation.
6. Analyze and present primary literature from the field of immunology.

Students will learn and apply the following techniques in BIO3090L:

- Use of micropipettes
- Staining and microscopic identification of blood cells
- Perform a basic ELISA
- Design, execute, and interpret an experiment involving an antigen-capture ELISA
- Analyze and present papers from the primary scientific literature
- Work in teams to collaborate and engage in problem-solving activities
- Write two lab reports

### **Required Texts**

- 1) The Immune System, 5<sup>th</sup> ed. by Peter Parham
- 2) Case Studies in Immunology, 7<sup>th</sup> ed. by Rosen & Geha

Students are responsible for having the required course textbooks prior to the first day of class.

All supplemental materials posted on this course site (including articles, book excerpts, or other documents) are provided for your personal academic use. These materials may be protected by copyright law and should not be duplicated or distributed without permission of the copyright owner.

### 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 5-unit class (3 units lecture, 2 units lab) delivered over 15 weeks. It is anticipated that students will spend a minimum of 37.5 participation hours per credit hour on their coursework. For this course, students will spend an estimated 200 total hours meeting the course learning outcomes. The time estimations are provided in the Canvas modules.

### Assessment and Grading

Grades will be based on the following:

A	B	C	D	F
A 92-100	B+ 88-89	C+ 78-79	D+ 68-69	F Less than 60
A- 90-91	B 82-87	C 72-77	D 62-67	
	B- 80-81	C- 70-71	D- 60-61	

**Grading: 1000 points total.** Please note that your grade for BIO3090 and BIO390L will be calculated together, and the same grade will be given for both courses. In addition, the following dates and times may be changed, as determined by the instructor.

Exams (450 pts): 3 exams – Unit 1 (100 pts), Unit 2 (150 pts), and the Final Exam (200 pts)

End of chapter homework: 220 pts

Reading assignments: 55 pts (due at 4pm)

Case Study quizzes: 75 pts (due at 4pm)

Lab quizzes: 20 pts

Lab assignments (180 pts): Lab reports and Research Presentations

#### Summary of due dates:

- Exams:**
- 1) Unit 1, 2/19 during lab
  - 2) Unit 2, 3/26 during lab
  - 3) Final exam, 5/4 from 4:30-7pm

- Major Lab Assignments:**
- 1) Lab report 1 (individual), 1/29
  - 2) Lab report 2 (individual), 4/16
  - 3) Research Presentations (in person group assignment), 4/23

## Final Examination Policy

Successful completion of this class requires taking the final examination on its scheduled day. The final examination schedule is posted on the [Traditional Undergraduate Records: Final Exam Schedules](#) site. If you find yourself scheduled for three (3) or more final examinations on the same day, you are authorized to contact each professor to arrange a different time for one of those exams. However, unless you have three (3) or more exams on the same day, no requests for alternative final examinations will be granted.

## Late Assignments

All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. No late reading assignments or case study quizzes will be accepted, since they are specific to that day's material. For other assignments, 10% will be deducted from the final grade for work that is one day late, and 20% will be deducted from the final grade for work that is two days late. *Note that late work will not be accepted after a graded assignment has been returned to the class.*

## Spiritual Care

Please be aware PLNU strives to be a place where you grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith.

If you have questions, a desire to meet with the chaplain or have prayer requests you can contact your professor or the [Office of Spiritual Life and Formation](#).

## State Authorization

State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on [State Authorization](#) to view which states allow distance education outside California.

## 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. **In particular, all homeworks, assignments, exams and laboratories are owned by Prof. Salgado and may not be shared with other individuals or groups outside of the students registered for the BIO3090, Spring, 2026.**

### **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 [Academic Policies](#) for definitions of kinds of academic dishonesty and for further policy information.

### **Artificial Intelligence (AI) Policy**

The use of Artificial Intelligence (AI) tools (e.g., ChatGPT, iA Writer, Marmot, Botowski, GrammarlyGo, Perplexity, etc.) **is prohibited in this course** for any aspect of your work, including idea generation, drafting, editing, or final submissions. This course is designed to assess your independent critical thinking, writing, and research skills without the assistance of AI technologies. Violations of this policy will be treated as breaches of academic integrity.

### **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](mailto: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](http://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](http://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](mailto:counselingservices@pointloma.edu) or find a list of campus pastors at [pointloma.edu/Title-IX](http://pointloma.edu/Title-IX).

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](http://www.pointloma.edu/bias)

## **PLNU Attendance and Participation Policy**

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. 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.

### **Assignments At-A-Glance:**

**Please see the following page for a schedule of content and due dates for the entire semester.**

**Note 1:** These dates and topics are subject to change, as necessarily determined by the instructor.

**Note 2:** The color coding corresponds to the content for the three major exams: Exam 1, Exam 2, & Final Exam, although the final exam will be partially cumulative.

Week	Date	Lectures	Assigned Reading and Assignments Due	Labs
1	01/12	Intro, Syllabus, Cell and Organs 1	Ch.1, pgs 1-10	
	01/14	Cells and Organs 2	Ch.1, pgs 10-23, <b>RA1, CS25</b>	
	01/15			No lab
2	01/19	No class-MLK Day		
	01/21	Cells and Organs 3	Ch.1, pgs 23-30	
	01/22			Lab 1- Blood Types
3	01/26	Antibodies 1	Ch.4, pgs 97-107, <b>Ch.1 HW, RA2</b>	
	01/28	Antibodies 2	Ch.4, pgs 107-114, <b>RA3</b>	
	01/29			Lab 2- Immune Response part I, <b>Lab report 1 due</b>
4	02/02	Antibodies 3	Ch.4, pgs 114-125, <b>RA4, CS2</b>	
	02/04	TCR/MCH 1	Ch.5, pgs 129-134, <b>RA5</b>	
	02/05			Lab 2- Immune Response part II
5	02/09	TCR/MHC 2	Ch.5, pgs 140-150, <b>CS12</b>	
	02/11	TCR/MHC 3	Ch.5, pgs 150-158, <b>Ch.4 HW, RA6</b>	
	02/12			<b>Exam 1 Review</b>
6	02/16	B cell development 1	Ch.6, pgs 163-177, <b>Ch.5 HW, CS1</b>	
	02/18	B cell development 2	Ch.6, pgs 177-185, <b>RA7</b>	
	02/19			<b>Exam 1</b>
7	02/23	T cell development 1	Ch.7, pgs 191-206, <b>RA8, CS8, Ch.6 HW</b>	
	02/25	T cell development 2	Ch.7, pgs 206-210, <b>CS17</b>	
	02/26			Lab 2- Immune Response part III
8	03/02	T cell immunity 1	Ch.8, pgs 213-220, <b>RA9, Ch.7 HW</b>	
	03/04	T cell immunity 2	Ch.8, pgs 220-230, <b>CS24/46</b>	
	03/05			Lab 2- ELISA part IV
9	03/09	No class-Spring Break		
	03/11	No class-Spring Break		
	03/12	No class-Spring Break		
10	03/16	B cell immunity 1	Ch.9, pgs 245-258, <b>RA10, CS2, Ch.8 HW</b>	
	03/18	B cell immunity 2	Ch.9, pgs 258-275, <b>CS32</b>	
	03/19			<b>Exam 2 Review, Research Presentation groups assigned</b>
11	03/23	Immune response 1	Ch.3, pgs 53-84, <b>CS27</b>	
	03/25	Immune response 2	Ch.3, pgs 84-92, <b>Ch.9 HW</b>	
	03/26			<b>Exam 2</b>
12	03/30	Immune Memory	Ch.11, pgs 305-316	
	04/01	Vaccines and Immunodeficiencies 1	Ch.11, pgs 317-334, <b>RA11</b>	
	04/02	No class-Easter Recess		
13	04/06	No class-Easter Recess		
	04/08	Vaccines and Immunodeficiencies 2	Ch.13, pgs 384-395, <b>CS5, Ch.11 HW</b>	
	04/09			Lab 2- ELISA part V
14	04/13	Vaccines and Immunodeficiencies 3	Ch.13 pgs 395-406	
	04/15	IgE mediated Immune Response 1	Ch.14 pgs 411-425, <b>Ch.13 HW</b>	
	04/16			Lab 3- Research presentation work, <b>Lab report 2 due</b>
15	04/20	IgE mediated Immune Response 2	Ch.14 pgs 425-435	
	04/22	Transplantation	Ch.15 pgs 439-470	
	04/23			Lab 3- Research presentations
16	04/27	Autoimmune Disease 1	Ch.16 475-487, <b>CS18, Ch.14 HW</b>	
	04/29	Autoimmune Disease 2	Ch.16 pgs 487-501, <b>CS38/42, Ch.16 HW</b>	
	04/30			<b>Final Exam Review</b>

**Lomabooks Instructions for Students:**

*This course is part of our course material delivery program, **LomaBooks**. The bookstore will provide each student with a convenient package containing all required physical materials; all digitally delivered materials will be integrated into Canvas.*

*You should have received an email from the bookstore confirming the list of materials that will be provided for each of your courses and asking you to select how you would like to receive any printed components (in-store pick up or home delivery). If you have not done so already, please confirm your fulfillment preference so the bookstore can prepare your materials.*

*For more information about **LomaBooks**, please go: [HERE](#)*