

College of Health Sciences

MSM 6003 Foundations of Medical Science

4 units

Spring 2026

January 12- May 6

In-person

Meeting Days: Mondays and Wednesdays

Meeting Times: 8:00 - 10:00 AM

Meeting Location: Room 156

Final Exam: (Day/Time):

Instructor: Anabel Flores

Email: aflores@pointloma.edu

Phone:

Office Location and Hours:

Please email me to make 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

The course will provide instruction in the basic sciences of medicine integral to understanding human disease. The course will cover topics in biochemistry, immunology, microbiology, and genetics.

Course Learning Outcomes

1. Explain the foundational biological and molecular mechanisms that underlie a wide range of human diseases.
2. Analyze how disruptions across multiple biological levels—genetic, cellular, tissue, organ, and systemic—contribute to disease onset and progression.
3. Interpret and evaluate scientific literature to understand current research, diagnostic approaches, and therapeutic strategies related to human disease.
4. Construct evidence-based experimental approaches to investigate disease mechanisms and evaluate potential interventions.
5. Communicate complex disease biology concepts clearly and effectively through written, visual, and oral scientific formats.
6. Apply multidisciplinary perspectives including biochemistry, genetics, microbiology, and immunology to compare diseases and propose informed solutions to biomedical challenges.

Program Learning Outcomes

1. Students will gain a comprehensive understanding of various medical sciences.
2. Students will be able to design, conduct, analyze, interpret, and present a research project in biomedical sciences.
3. Students will develop strong written and oral communication skills appropriate for a professional practitioner.
4. Students will be able to work effectively individually and in collaborative, multi-disciplinary teams.

Institutional Learning Outcomes

1. **Learning, Informed by our Faith in Christ**
Students will acquire knowledge of human cultures and the physical and natural world while developing skills and habits of the mind that foster lifelong learning.
2. **Growing, in a Christ-centered Faith Community**
Students will develop a deeper and more informed understanding of others as they negotiate complex professional, environmental, and social contexts.
3. **Serving, in a Context of Christian Faith**
Students will serve locally and/or globally in vocational and social settings.

Required Texts and Recommended Study Resources

PowerPoint handouts will be given to students. The following texts are recommended to enhance understanding of the material:

Kuby Immunology, W.H. Freeman and Co., 8th Edition 2019. ISBN 978-1-4641-8978-4

Alberts, Molecular Biology of the Cell, 7th edition 2022. ISBN 978-0393884630

Note: Older versions can also be used for the course

Note: Students are responsible for having the required 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.

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. 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 4-unit class delivered over 16 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 150 total hours meeting the course learning outcomes. The time estimations are provided below and in the Canvas modules.

Course Information

<i>Activity Category</i>	<i>Time-to-Complete (Hours)</i>
Assignments ~ 3 hours/assignment Except assignment 9 and 10	24 hours
Exam preparation	50 hours
Exams (3 total X 2 hours each)	6 hours
Research presentation preparation	10 hours
Instruction and in class activities	60 hours
Total:	150 hours

Assessment and Grading

Weighted Grades

This course uses weighted grades. Each assignment category is worth a certain percentage of the total grade (100%) for the course, as specified in the table below:

Grade Scale		
<i>Assignment Category</i>	<i>Description</i>	<i>Percentage of Total Grade</i>
Exams	3 exams total, each worth 200 points, due on Thursday at midnight	60%
Assignments	10 total, each worth 20 points, due every Friday at midnight	20%
Research presentations	Students will choose a disease at the beginning of the semester and will give a 20 minute presentation on that disease from multiple biological levels.	10%
Class engagement	Students will engage in class activities and discussions	10%

It is important to read the comments posted in the gradebook as these comments are intended to help students improve their work. Final grades will be posted by the due date as posted in the Academic Calendar.

Grading Scale

The following grading scale will be used for all exams and final course grades:

- 93-100% = A
- 90 - 92% = A-
- 87 – 89% = B+
- 84 – 86% = B
- **81 – 83% = B-**
- 78 – 80% = C+
- *75 – 77% = C
- 73 – 74% = C-
- 71 – 72% = D+
- 68 – 70% = D
- Below 68% = F

Content Warning

I acknowledge that each of you comes to PLNU with your own unique life experiences. This contributes to the way you perceive various types of information. In this course, all of the class content, including that which may be intellectually or emotionally challenging, has been intentionally curated to achieve the learning goals for this course. The decision to include such material is not taken lightly. These topics include: fundamentals of cells, genetics, and immunology, the central dogma, DNA engineering, cell metabolism, cell proliferation, immunity

and memory, cancer, the microbiome, and mental health. If you encounter a topic that is intellectually challenging for you, it can manifest in feelings of discomfort and upset. In response, I encourage you to come talk to me or your friends or family about it. Class topics are discussed for the sole purpose of expanding your intellectual engagement in the area of medical science, and I will support you throughout your learning in this course.

Trigger Warning

I 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 MSM 6003 Foundations of Medical Science, we will cover a variety of topics, some of which you may find triggering. These topics include fundamentals of cells, genetics, and immunology, the central dogma, DNA engineering, cell metabolism, cell proliferation, immunity and memory, cancer, the microbiome, and mental health. 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, I 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 a 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 assessing your learning on that material. Class topics are discussed for the sole purpose of expanding your intellectual engagement in the area of medical sciences, and I will support you throughout your learning in this course.

Incompletes and 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. Incompletes will only be assigned in extremely unusual circumstances.

PLNU Spiritual Care

Bakersfield Campus

PLNU strives to be a place where you grow as a whole person. To this end, we provide resources for our Graduate students to encounter God and grow in their Christian faith. At the Bakersfield campus we have an onsite chaplain, Rev. Brent Kall, who is available during class break times across the week. If you have questions or a desire to meet or share any prayer requests with Rev. Brent Kall, you may contact him directly at bkall@pointloma.edu. Also, there is a weekly Email Newsletter called “The Encourager” that provides a brief devotional and all his contact information.

Balboa Campus

PLNU strives to be a place where you grow as a whole person. To this end, we provide resources for our graduate students to encounter God and grow in their Christian faith. At the Balboa campus, we have an onsite chaplain, Rev. Kevin Portillo, who is available during class break times across the week. If you have questions or a desire to meet or share any prayer requests with Rev. Portillo, you may contact him directly at KevinPortillo@pointloma.edu.

Liberty Station Campus

PLNU strives to be a place where you grow as a whole person. To this end, we provide resources for our Graduate students to encounter God and grow in their Christian faith. At the Liberty Station campus we have an onsite chaplain who is available during class break times across the week. If you have questions or a desire to meet or share any prayer requests with Dr. Sylvia Cortez Masyuk, you may contact her directly at scortezm@pointloma.edu.

Mission Valley

PLNU strives to be a place where you grow as a whole person. To this end, we provide resources for our Graduate students to encounter God and grow in their Christian faith. At the Mission Valley (MV) campus we have an onsite chaplain who is available during class break times across the week. If you have questions or a desire to meet or share any prayer requests with the onsite chaplain, you may email Dr. Sylvia Cortez Masyuk at scortezm@pointloma.edu.

In addition, on the MV campus, there is a prayer chapel on the third floor. It is open for use as a space set apart for quiet reflection and prayer.

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 of 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.

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 1.5, GrammarlyGo, Perplexity, etc.) in this course. Any work that utilizes AI-based tools must be clearly identified as such, including the specific tool(s) used. Please use the following sources to guide your citations when using AI.

- [MLA Style Center: Citing Generative AI](#)
- [APA Style: How to Cite ChatGPT](#)
- [Chicago Manual of Style: Citing Content Developed or Generated by AI](#)

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 [PLNU's Nondiscrimination webpage](#).

Sexual Misconduct and Discrimination

Point Loma Nazarene University faculty are committed to helping create a safe learning environment for all students. 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 help and support are available through the [Title IX Office](#). Please be aware that under

Title IX of the Education Amendments of 1972, it is 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 via our [Sexual Harassment and Discrimination Policy](#).

If you (or someone you know) have experienced other forms of discrimination or bias, you can find more information on reporting and resources via our [Nondiscrimination and Anti-harassment Policy](#).

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 details.

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.

Note: For synchronous courses with an online asynchronous week, refer to the Online Asynchronous Class Attendance policy listed below.

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.

Course Modality Definitions

1. Online Courses: These are courses with class meetings where all instruction and interaction are fully online.
 1. Synchronous Courses: At least one class meeting takes place at a designated time.
 2. Asynchronous Courses: All class meetings are asynchronous.
2. Hybrid Courses: These are courses with class meetings that take place both in the classroom and online synchronously and/or asynchronously.
3. In-Person Courses: These are courses that meet in person with the instructor and students in a physical classroom setting. With approval by the area dean, this may include up to 25% of qualified class interactions through a Learning Management System (such as Canvas).

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 nor allowable) 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.

Assignments-at-a-Glance

The course summary below lists our assignments and their due dates. Click on any assignment to review it.

Course Schedule

Assignment	Description	Due date (midnight)
1	Designing a novel antibiotic	January 16
2	Viral diversity	January 23
3	The immune response case	January 30
4	CRISPR-cas9	February 20
5	The mystery of the toxic flea dip	February 27
6	Regulation of cell division experiment	March 20
7	Building a clinical case	March 27
8	The young girl with multiple endocrine issues	April 3
9	Research presentation feedback	April 29
10	Research presentation feedback	April 29
Exam 1	Week 1-4 content	February 5
Exam 2	Week 5-8 content	March 5
Exam 3	Week 10-15 content	April 23
Research presentation	Students will be assigned a date to give a 10 minute presentation	April 27 or 29

Tentative Lecture Calendar*

**NOTE: This calendar, especially the length of time spent on each chapter and related videos/lectures, is subject to change and all changes will be announced in class.*

Week 1: 1/12 & 1/14

Monday: Prokaryotes and Eukaryotes

Wednesday: Eukaryotic cells inner universe: structures and macromolecules

Week 2: 1/19 & 1/21

Monday: MLK Day, No class

Wednesday: Life's instruction manual – DNA structure and DNA replication

Week 3: 1/26 & 1/28

Monday: Innate immunity

Wednesday: Adaptive Immunity

Week 4: 2/2 & 2/4

Monday: The Complement System

Wednesday: Genetics of Immunity

Week 5: 2/9 & 2/11

Monday: Transcription and Translation and Modifications

Wednesday: Transcription and Translation and Modifications

Week 6: 2/16 & 2/18

Monday: CRISPR-cas9 and Genetic Engineering

Wednesday: Cellular and Energy Metabolism

Week 7: 2/23 & 2/25

Monday: Regulation of Cellular Energy Metabolism

Wednesday: Regulation of Cellular Energy Metabolism

Week 8: 3/2 & 3/4

Monday: Regulation of the Cell Cycle

Wednesday: Regulation of the Cell Cycle

Week 9: 3/9 & 3/11

Monday: Spring break, no class

Wednesday: Spring break, no class

Week 10: 3/16 & 3/18

Monday: Mechanisms of Cell Cycle Dysregulation and Disease

Wednesday: Mechanisms of Cell Cycle Dysregulation and Disease

Week 11: 3/23 & 3/25

Monday: T Cell Development

Wednesday: B Cell Development

Week 12: 3/30 & 4/1

Monday: Autoimmune Diseases

Wednesday: Infectious Diseases and Vaccine Development

Week 13: 4/6 & 4/8

Monday: Molecular Biology Techniques

Wednesday: Human Microbiota

Week 14: 4/13 & 4/15

Monday: Microbiome and Mental Health

Wednesday: Microbiome and Mental Health

Week 15: 4/20 & 4/22

Monday: Student Research Presentations

Wednesday: Student Research Presentations

Week 16: 4/27 & 4/29

Monday: No Class, CBU Graduation

Wednesday: Exam 3 Review