

 <p>POINT¹⁹  LOMA⁰² NAZARENE UNIVERSITY</p>	<p>Department of Biology BIO2020: Microbiology of Infectious Diseases Sections 1 and 2 3 units</p>
Spring 2021	

Section 1: M/W/F 11:00-11:55 am	Instructor: Dr. David Cummings
Section 2: M/W/F 12:15-1:10 pm	Phone: 619-849-2642
Location: Taylor Hall room 106	Email: davidcummings@pointloma.edu
Required book: <i>Microbiology with Diseases by taxonomy</i> (Bauman)	Office location: Rohr Science office 176
Required app: Sanford Guide to Antimicrobial Therapy	Office hours: M/W 2-4 pm on Zoom

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

A study of microbial physiology, the diseases associated with infections by certain pathogenic microbes and the vertebrate response to microbial infections. Does not apply toward the Biology major. Lecture and lab. Offered every year.

Prerequisite(s): CHE1003 or CHE1052; BIO1040 (may be taken concurrently).

COURSE LEARNING OUTCOMES

The unifying theme of this course is pathogenesis, the detrimental interactions between microorganisms and their human hosts. Our main objectives will be to understand what pathogenic microorganisms are, how they cause disease, and how we may be able to control them.

Specific learning outcomes: By the end of the semester, students will be able to

- describe the physical nature and life cycles of bacteria and viruses;
- distinguish bacteria from viruses and the diseases they cause;
- recognize and distinguish diseases caused by enteric bacteria, Gram-positive rods, and Gram-positive cocci;
- evaluate different antibiotics for application to the different groups of bacterial pathogens.

REQUIRED TEXTBOOK AND APP

- *Microbiology with Diseases by Taxonomy, 6th Edition*. Only the [eText](#) is required.
- *The Sanford Guide to Antimicrobial Therapy mobile app*: Available [here](#), coupon code "PointLoma2021EDUclass"

CLASS SCHEDULE

WK 1 | March 1-5 | The Chemistry of Microbiology (CH.2) and Cell Structures and Function (CH.3)

- Basic chemistry review
- Eukaryotic cells
- Homework 1 (due Friday March 5 before class)

WK 2 | March 8-12 | Cell Structures and Function (CH.3) and Pathogenic Gram-Positive Bacteria (CH.19)

- Prokaryotic cells
- Some Gram-positive pathogens
- Homework 2 (due Friday March 12 before class)

WK 3 | March 15-19 | Microbial Metabolism (CH.5) and Case Study 1

- Enzymes and energy
- Carbohydrate catabolism overview
- Homework 3 (due Friday March 19 before class)
- UTI Case study (definitions due Friday March 19 before class)

WK 4 | March 22-26 | Microbial Metabolism (CH.5) and Exam 1

- Cellular respiration
- Fermentation
- Exam 1 (Friday March 26)

WK 5 | March 29-April 2 | Microbial Nutrition and Growth (CH.6)

- Nutrition and growth
- Homework 4 (due Friday April 2 before class)

WK 6 | April 5-9 | Microbial Genetics (CH.7)

- Overview of replication, transcription, and translation
- Horizontal gene transfer
- Homework 5 (due Friday April 9 before class)

WK 7 | April 12-16 | Antimicrobial Drugs (CH.10) and Case Study 2

- Antibiotics
- Antibiotic resistance
- Homework 6 (due Friday April 16 before class)
- RTI Case study (definitions due Friday April 16 before class)

WK 8 | April 19-23 | Viruses (CH.13)

- Bacteriophage

- Human viruses
- Homework 7 (due Friday April 23 before class)

WK 9 | April 26-30 | Pathogenic RNA Viruses (CH.25) and Exam 2

- Influenza viruses
- Exam 2 (Friday April 30)

WK 10 | May 3-7 | Infection (CH.14)

- Virulence factors
- Modes of transmission
- Homework 8 (due Friday May 7 before class)

WK 11 | May 10-14 | Innate Immunity (CH.15)

- Innate immunity
- Homework 9 (due Friday May 14 before class)

WK 12 | May 17-21 | Adaptive Immunity (CH.16), Immunization (CH.17), and Case Study 3

- Adaptive immune response
- Vaccines
- Homework 10 (due Friday May 21 before class)
- GITI Case study (definitions due Friday May 21 before class)

WK 13 | May 24-28 | Pathogenic Gram-Negative Bacilli (CH.20) and Exam 3

- Specific Gram-negative bacilli
- Exam 3 (Friday May 28)

WK 14 | May 31-June 4 | Review for Final Exam

WK 15 | June 7-11 | Final Exam Week

- Final Exam on Friday June 11 at 10:30 am - 1 pm (section 1)
 - Final Exam on Monday June 7 at 10:30 am – 1 pm (section 2)
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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 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 126 total hours meeting the course learning outcomes. The weekly time estimations are provided in the Canvas modules.

ASSESSMENT AND GRADING

A total of 665 points are possible in the lecture portion of BIO2020. Another 150 points are possible in the lab (see separate syllabus).

Exams (500 points) –There will be four multiple-choice exams, including the final, in this course, each worth 125 points. Exam questions will be focused on material from lecture (as opposed to lab). Exams 2 and 3 will be semi-cumulative, with approximately 20% of the points

coming from questions associated with the previous chapters (*i.e.*, those on which you have already been tested). The final exam will be 100% cumulative, covering the entire semester. If you have a legitimate conflict with an exam date/time, you must inform the instructor prior to the week of the exam to arrange for a makeup exam. Students are responsible for all lecture material AND everything on the reading guides, whether or not it is covered in class. Exams will be administered either in person or online through Honorlock.

Homework (100 points) – Homework assignments (10 points each) will be due on Fridays before class begins. Due dates can be found in the course schedule below. We will discuss the homework problems together on Zoom on Fridays.

Case studies (30 points) – Learning infectious disease principles in context can be a powerful way to ensure retention of the material. At three strategic points in the semester, students will be assigned a case study describing a real infection. Definitions will be assigned and should be typed up and submitted online by the due date (4 points). All of class time (Zoom) on the due date will be dedicated to completion of a group worksheet (6 points), and two or three questions from the case studies will be found on the exams.

Attendance and participation (35 points) – While San Diego County remains in the purple tier, all students will meet synchronously on Zoom Mondays, Wednesdays, and Fridays. Once we are moved to the red tier, we will meet live in person every Monday (Group A) or Wednesday (Group B), and on Zoom on Fridays (Groups A and B together). Attendance will be taken and 1 point awarded per period for attendance *and participation*. Note the complete attendance policy below. In addition, there are two activities in Canvas under the Module “Getting Started” that are worth another 5 pts.

Point breakdown

Exams	500 points
Homework	100 points
Case studies	30 points
Attendance and participation	35 points
TOTAL	665 possible points

Grade scale based on percentages

A	92-100%
A-	90-91%
B+	88-89%
B	82-87%
B-	80-81%
C+	78-79%
C	72-77%
C-	70-71%
D+	68-69%
D	62-67%
D-	60-61%
F	0-59%

*NOTE: Final percentages will be rounded to the nearest whole number and the letter grade assigned will be non-negotiable.

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 online (distance education) outside of California.

INCOMPLETES AND LATE ASSIGNMENTS

All assignments are to be submitted/turned in by their listed due date and time—including assignments posted in Canvas. Incompletes will only be assigned in extremely unusual circumstances.

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 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. Faculty should follow and students may appeal using the procedure in the university Catalog. See [Academic Policies](#) for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center (DRC@pointloma.edu or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will

thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all **synchronous** (live and on Zoom) class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions (virtual or face-to-face), 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 drop date or, after that date, receive the appropriate grade for their work and participation. In some courses, a portion of the credit hour content will be delivered **asynchronously** and attendance will be determined by submitting the assignments by the posted due dates. See [Academic Policies](#) in the Undergraduate Academic Catalog. If absences exceed these limits but are due to university excused health issues, an exception will be granted.

Asynchronous Attendance/Participation Definition

A day of attendance in asynchronous content is determined as contributing a substantive note, assignment, discussion, or submission by the posted due date. Failure to meet these standards will result in an absence for that day. Instructors will determine how many asynchronous attendance days are required each week.

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 students have questions, a desire to meet with the chaplain or have prayer requests you can contact the [Office of Spiritual Development](#).

USE OF TECHNOLOGY

In order to be successful in the online 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 compatible with their computer available to use. If a student is in need of technological resources please contact student-tech-request@pointloma.edu. Problems with technology do not relieve you of the responsibility of participating, turning in your assignments, or completing your class work.