

Course Syllabus

[Jump to Today](#)

 [Edit](#)



CHEMISTRY 1003L

*Intro to General, Organic, and Biological
Chemistry Lab*

1 Unit

Fall 2021

Meeting days & times:

Monday 2:45 - 5:35 pm

Monday 6:00 - 8:50 pm

Tuesday 9:30 am - 12:20 pm

Tuesday 1:30 - 4:20 pm

Tuesday 6:00 - 8:50 pm

Wednesday 6:00 - 8:50 pm

Thursday 6:00 - 8:50 pm

Instructor :

Dr. Katherine Maloney

Dr. Allegra Aron

Prof. Lindsey Fleckenstein

Prof. Jeffrey Snowbarger

*Contact info & photos for
instructors and TAs can be
found [here](#)

Meeting location:

Sator 221

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.

Foundational Explorations Mission

PLNU provides a foundational course of study in the liberal arts informed by the life, death, and resurrection of Jesus Christ. In keeping with the Wesleyan tradition, the curriculum equips students with a broad range of knowledge and skills within and across disciplines to enrich major study, lifelong learning, and vocational service as Christ-like participants in the world's diverse societies and culture.

COURSE DESCRIPTION

From the PLNU Catalog: An inquiry-based laboratory that is a co-requisite for CHE1003.

COURSE LEARNING OUTCOMES

By the end of the course, you will:

- Explain the importance of chemistry in the life of bacteria.
- Design an experiment to test the effect of culture conditions on antibiotic production in bacteria.
- Select appropriate techniques to separate and identify molecules from a complex sample.
- Analyze genomic and metabolomic data to identify what kinds of antibiotics a bacterium has the 'blueprints' to produce, versus which antibiotics it actually produces.
- Analyze and communicate your findings back into the global Tiny Earth Network.

REQUIRED RESOURCES

For lab, you'll need to purchase a pair of protective **lab glasses** and a **lab coat**. You may either bring your own or purchase them from the chemistry club on the first day of lab for \$10 (\$3 for the the lab coat, and \$7 for the lab glasses). You are encouraged to store these in a designated location in the lab.

Since this is a brand new course, your 'text' will be excerpts from the not-yet-published lab manual, included here in the Canvas course. (*Note that your input on the readings is very welcome and may shape the final manuscript!*)

EXAMPLE LAB SCHEDULE

In this lab, we will be doing real scientific research, which is to say that *we don't know the outcome ahead of time!* As a result, the precise activities week-to-week WILL vary depending on the outcome of a previous experiment. Treat the schedule below as an *example* of one possible sequence of activities. Yours can - and likely will - look quite different!

Occasionally, lab may be held **in one of the computer labs in Ryan Library** or **asynchronously** (in which case you can complete the lab at a time of your choice during the week). Your instructor will let you know the preceding week if this is the case.

Week	Readings & Assignments	Lab Agenda
1	Section 0: Tiny Earth	Introductions
(8/31, 9/7-9/9)	Lab Syllabus & Schedule	The Antibiotic Crisis

	<p>Protocol: Cross-streaking assay</p> <p>Week 1 Postlab assignment</p>	<p>Cross streak: TE3760 vs. <i>B. subtilis</i></p>
<p>2</p> <p>(9/13-9/16)</p>	<p>Section 1: Natural Products</p> <p>Protocols: Liquid-liquid extraction, Scientific measurements</p> <p>Week 2 Prelab Assignment</p> <p>Week 2 Postlab Assignment</p>	<p>What are natural products?</p> <p>Liquid-liquid extraction</p> <p>Determining density</p>
<p>3</p> <p>(9/20-9/23)</p>	<p>Section 2: How natural products are made</p> <p>Meet Tiny Earth Strain TE3760</p> <p>Protocol: AntiSMASH</p> <p>Week 3 Prelab Assignment</p> <p>Week 3 Postlab Assignment</p>	<p>The Central Dogma</p> <p>AntiSMASH tutorial: <i>S. erythraea</i></p> <p><i>(Bring your computer)</i></p>
<p>4</p> <p>(9/27-9/30)</p>	<p>Section 3: Turning on antibiotic production lines</p> <p>Protocol: AntiSMASH</p> <p>Week 4 Prelab Assignment</p> <p>Week 4 Postlab Assignment</p>	<p>Discussion: Culture conditions</p> <p>Write media recipe/instructions for your TA to prepare your chosen media</p>
<p>5</p> <p>(10/4-10/7)</p>	<p>Protocols: Growing in liquid culture, growing in solid culture</p> <p>Week 5 Prelab Assignment</p> <p>Week 5 Postlab Assignment</p>	<p>Inoculation</p>
<p>6</p> <p>(10/11-10/14)</p>	<p>Section 2: How natural products are made</p> <p>Protocol: AntiSMASH of TE3760</p> <p>Week 6 Prelab Assignment</p> <p>Week 6 Postlab Assignment</p>	<p>AntiSMASH analysis of TE3760</p> <p><i>(Bring your computer)</i></p>

7 (10/18-10/21)	<p>Section 4: Extraction</p> <p>Protocol: Liquid-liquid extraction, disk-diffusion bioassay</p> <p>Week 7 Prelab Assignment</p> <p>Week 7 Postlab Assignment</p>	<p>TE3760 Extraction</p> <p>Disk diffusion bioassay</p>
8 (10/25-10/28)	<p>Section 5: Chemical separations</p> <p>Protocols: TLC, TLC bioautography</p> <p>Week 8 Prelab Assignment</p> <p>Week 8 Postlab Assignment</p>	<p>Disk diffusion results</p> <p>TLC of TE3760</p> <p>TLC bioautography</p>
9 (11/1-11/4)	<p>Section 6: Mass Spectrometry</p> <p>Protocol: Exploring LCMS data</p> <p>Week 9 Prelab Assignment</p> <p>Week 9 Postlab Assignment</p>	<p>Examine LCMS data of antibiotics, TE3760</p> <p>TLC Bioautography of active extracts <i>(In the computer lab)</i></p>
10 (11/8-11/11)	<p>Section 7: NMR spectroscopy</p> <p>Protocols: NMR sample prep and data acquisition, NMR data analysis</p> <p>Week 10 Prelab Assignment</p> <p>Week 10 Postlab Assignment</p>	<p>Acquire ^1H NMR and HSQC spectra on crude extracts</p> <p>Identify compound classes using NMR</p>
11 (11/15-11/18)	<p>Section 7: NMR spectroscopy</p> <p>Protocol: SMART NMR</p> <p>Week 11 Prelab Assignment</p> <p>Week 11 Postlab Assignment</p>	<p>Identify candidate structures using SMART NMR & LCMS data from Week 10 <i>(In the computer lab)</i></p>
Week of 11/22	Thanksgiving break - no lab	
12	Poster workshop	Work on final poster presentation

(11/29-12/2)	Week 12 Prelab Assignment Week 12 Postlab Assignment	
13 (12/6-12/8)	Week 13 Prelab Assignment	Tiny Earth Chemistry Poster Session

All readings are from the Tiny Earth Chemistry guide, and will be provided on Canvas.

ASSESSMENT AND GRADING

The activities described above will contribute to your total course grade according to the following distribution:

Prelab assignments	25%
Postlab assignments	50%
Participation	10%
Final Poster Presentation	15%

Student grades will be posted in the Canvas grade book throughout the course. Letter grades will be assigned at the end of the course based on your percentage of total possible points, according to the following scale:

Standard Grade Scale Based on Percentages

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

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](#) (<https://www.pointloma.edu/offices/office-institutional-effectiveness-research/disclosures>) to view which states allow online (distance education) outside of California.

INCOMPLETES AND LATE ASSIGNMENTS

All assignments are to be submitted/turned in by the beginning of the lab session when they are due—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](http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278) (<http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278>) for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. 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 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

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 and/or if they do not wish to utilize some or all of the elements of their AP in that course.

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.

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 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](https://catalog.pointloma.edu/content.php?catoid=46&navoid=2650#Class_Attendance) [_\(https://catalog.pointloma.edu/content.php?catoid=46&navoid=2650#Class_Attendance\)](https://catalog.pointloma.edu/content.php?catoid=46&navoid=2650#Class_Attendance) in the Undergraduate Academic Catalog. If absences exceed these limits but are due to university excused health issues, an exception will be granted.

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](https://www.pointloma.edu/offices/spiritual-development) [_\(https://www.pointloma.edu/offices/spiritual-development\)](https://www.pointloma.edu/offices/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](https://help.pointloma.edu/TDCClient/1808/Portal/KB/ArticleDet?ID=108349) [_\(https://help.pointloma.edu/TDCClient/1808/Portal/KB/ArticleDet?ID=108349\)](https://help.pointloma.edu/TDCClient/1808/Portal/KB/ArticleDet?ID=108349) 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 [_\(mailto:student-tech-request@pointloma.edu\)](mailto: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.

ASSIGNMENTS AT-A-GLANCE

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

Course Summary:

Date	Details	Due
Tue Aug 31, 2021	 Week 1 Prelab Assignment _(https://canvas.pointloma.edu/courses/57182/assignments/683261) (Section 1-CHE1003L)	due by 2:45pm
	 Week 1 Prelab Assignment _(https://canvas.pointloma.edu/courses/57182/assignments/683261) (Section 2-CHE1003L)	due by 6pm
Tue Sep 7, 2021	 Week 1 Prelab Assignment _(https://canvas.pointloma.edu/courses/57182/assignments/683261) (Section 3-CHE1003L)	due by 9:30am

Date	Details	Due
	 Week 1 Prelab Assignment https://canvas.pointloma.edu/courses/57182/assignments/683261 (Section 4-CHE1003L)	due by 1:30pm
	 Week 1 Prelab Assignment https://canvas.pointloma.edu/courses/57182/assignments/683261 (Section 5-CHE1003L)	due by 6pm
Wed Sep 8, 2021	 Week 1 Prelab Assignment https://canvas.pointloma.edu/courses/57182/assignments/683261 (Section 6-CHE1003L)	due by 6pm
Thu Sep 9, 2021	 Week 1 Prelab Assignment https://canvas.pointloma.edu/courses/57182/assignments/683261 (Section 7-CHE1003L)	due by 6pm
Mon Sep 13, 2021	 Week 1 Postlab Assignment: Elevator Speech https://canvas.pointloma.edu/courses/57182/assignments/683258 (Section 1-CHE1003L)	due by 2:45pm
	 Week 1 Postlab Assignment: Elevator Speech https://canvas.pointloma.edu/courses/57182/assignments/683258 (Section 2-CHE1003L)	due by 6pm
	 Week 1 Postlab Assignment: Elevator Speech https://canvas.pointloma.edu/courses/57182/assignments/683258 (Section 3-CHE1003L)	due by 9:30am
Tue Sep 14, 2021	 Week 1 Postlab Assignment: Elevator Speech https://canvas.pointloma.edu/courses/57182/assignments/683258 (Section 4-CHE1003L)	due by 1:30pm
	 Week 1 Postlab Assignment: Elevator Speech https://canvas.pointloma.edu/courses/57182/assignments/683258 (Section 5-CHE1003L)	due by 6pm
Wed Sep 15, 2021	 Week 1 Postlab Assignment: Elevator Speech https://canvas.pointloma.edu/courses/57182/assignments/683258 (Section 6-CHE1003L)	due by 6pm

Date	Details	Due
Thu Sep 16, 2021	 Week 1 Postlab Assignment: Elevator Speech (https://canvas.pointloma.edu/courses/57182/assignments/683258) (Section 7-CHE1003L)	due by 6pm
	 Final Poster Presentation (https://canvas.pointloma.edu/courses/57182/assignments/683259)	
	 Week 1 Lab (https://canvas.pointloma.edu/courses/57182/assignments/683260)	
	 Week 1 Postlab Assignment - responses due (https://canvas.pointloma.edu/calendar?event_id=104978&include_contexts=course_57182)	
	 Week 10 Lab (https://canvas.pointloma.edu/courses/57182/assignments/683262)	
	 Week 10 Postlab Assignment: LCMS (https://canvas.pointloma.edu/courses/57182/assignments/683263)	
	 Week 10 Prelab Assignment: LCMS (https://canvas.pointloma.edu/courses/57182/assignments/683264)	
	 Week 11 Lab (https://canvas.pointloma.edu/courses/57182/assignments/683265)	
	 Week 11 Postlab Assignment: NMR (https://canvas.pointloma.edu/courses/57182/assignments/683266)	
	 Week 11 Prelab Assignment: NMR (https://canvas.pointloma.edu/courses/57182/assignments/683267)	
	 Week 12 Lab (https://canvas.pointloma.edu/courses/57182/assignments/683268)	

 [Week 12 | Postlab Assignment: SMART NMR](#)
(<https://canvas.pointloma.edu/courses/57182/assignments/683269>)

 [Week 12 | Prelab Assignment: SMART NMR](#)
(<https://canvas.pointloma.edu/courses/57182/assignments/683270>)

 [Week 13 Lab](#)
(<https://canvas.pointloma.edu/courses/57182/assignments/683271>)

 [Week 13 | Postlab Assignment: Course feedback & final poster prep](#)
(<https://canvas.pointloma.edu/courses/57182/assignments/683272>)

 [Week 13 | Prelab Assignment: Gathering the pieces of your poster](#)
(<https://canvas.pointloma.edu/courses/57182/assignments/683273>)

 [Week 2 Lab](#)
(<https://canvas.pointloma.edu/courses/57182/assignments/683274>)

 [Week 2 | Postlab Assignment: Extraction Questions](#)
(<https://canvas.pointloma.edu/courses/57182/assignments/683275>)

 [Week 2 | Prelab Assignment](#)
(<https://canvas.pointloma.edu/courses/57182/assignments/683276>)

 [Week 3 Lab](#)
(<https://canvas.pointloma.edu/courses/57182/assignments/683277>)

 [Week 3 | Postlab Assignment: TLC & Bioassays](#)
(<https://canvas.pointloma.edu/courses/57182/assignments/683278>)

 [Week 3 | Prelab Assignment - responses due](#)
(https://canvas.pointloma.edu/calendar?event_id=104979&include_contexts=course_57182)

Date	Details	Due
	 Week 3 Prelab Assignment: Is natural better? (https://canvas.pointloma.edu/courses/57182/assignments/683257)	
	 Week 4 Lab - on Zoom (https://canvas.pointloma.edu/courses/57182/assignments/683279)	
	 Week 4 Zoom lab meeting (https://canvas.pointloma.edu/calendar?event_id=104980&include_contexts=course_57182)	
	 Week 4 Zoom lab meeting - Section 2 (https://canvas.pointloma.edu/calendar?event_id=104981&include_contexts=course_57182)	
	 Week 4 Postlab Assignment: antiSMASH Questions (https://canvas.pointloma.edu/courses/57182/assignments/683280)	
	 Week 4 Prelab Assignment: Natural product building blocks (https://canvas.pointloma.edu/courses/57182/assignments/683281)	
	 Week 5 Lab (https://canvas.pointloma.edu/courses/57182/assignments/683282)	
	 Week 5 Postlab Assignment: Culture conditions (https://canvas.pointloma.edu/courses/57182/assignments/683283)	
	 Week 5 Prelab Assignment: Culture conditions discussion (https://canvas.pointloma.edu/courses/57182/assignments/683256)	
	 Week 6 Lab (https://canvas.pointloma.edu/courses/57182/assignments/683284)	
	 Week 6 Postlab Assignment (https://canvas.pointloma.edu/courses/57182/assignments/683285)	
	 Week 6 Prelab Assignment (https://canvas.pointloma.edu/courses/57182/assignments/683286)	

Date	Details	Due
	 Week 7A/8B Lab (https://canvas.pointloma.edu/courses/57182/assignments/683287)	
	 Week 7A/8B Postlab assignment: Solvents & solubility (https://canvas.pointloma.edu/courses/57182/assignments/683288)	
	 Week 7A/8B Prelab Assignment: Extraction (https://canvas.pointloma.edu/courses/57182/assignments/683289)	
	 Week 7B/8A Postlab Assignment: antiSMASH Questions (https://canvas.pointloma.edu/courses/57182/assignments/683290)	
	 Week 9 Lab (https://canvas.pointloma.edu/courses/57182/assignments/683291)	
	 Week 9 Postlab Assignment: TLC Questions (https://canvas.pointloma.edu/courses/57182/assignments/683292)	
	 Week 9 Prelab Assignment: TLC (https://canvas.pointloma.edu/courses/57182/assignments/683293)	