

# CHEMISTRY 1003

## Fundamentals of General, Organic and Biological Chemistry

### Welcome to CHE 1003:

Chemistry 1003 is an introductory chemistry class, and it is suitable for anyone who has never taken any chemistry classes before and is a General Education requirement. Chemistry might be scary for some of you, but we would like to challenge you to work regularly, practice and ask questions in order to succeed. Some teaching methods used in this course (group and team work, peer evaluation, online lectures) might be different than what you are used to, yet we are confident that it will improve your learning experience and you will be better prepared for your future endeavors. We are glad you are here and we look forward to helping you discover or rediscover the importance of chemistry in your environment.

<b>Meeting days:</b> Monday <i>or</i> Wednesday + Friday via Zoom video conference	<b>Instructor title and name:</b> Dr. Matthieu Rouffet, Professor of Chemistry and Department Chair
<b>Meeting times:</b> 8.15 am - 9.25 am	<b>Phone:</b> 619-849-3278
<b>Meeting location:</b> Remote via Zoom	<b>Email:</b> matthieurouffet@pointloma.edu
<b>Final Exam:</b> (day/time)	<b>Office location and hours:</b> Via Zoom TBD

### 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

**From the PLNU Catalog:** Examination of those aspects of inorganic and organic chemistry that are pertinent to biology and chemistry. Examines the structures and metabolic reactions of biomolecules. Provides a background for nursing, family and consumer sciences and physical education majors. (Meets a general education requirement; does not count toward any Chemistry Department majors.)

Chemistry 1003 is an introductory chemistry class suitable for anyone who has never taken any chemistry classes before.

### **COURSE LEARNING OUTCOMES**

At the end of the course you will be able to:

1. Speak fluently in the language of chemistry, describing the composition of matter at multiple levels: from the macroscopic to the atomic level.
2. Predict the properties of atoms, molecules, ions and molecular compounds, on the basis of structure.
3. Write balanced equations to describe common types of chemical transformations, including acid-base reactions.
4. Identify the main organic functional groups, and explain how intermolecular forces influence their properties.
5. Identify major classes of biological molecules, and describe how their chemical structure facilitates their biological function.

### **FOUNDATIONAL EXPLORATIONS LEARNING OUTCOMES**

The following Foundational Explorations Learning Outcome (FELO) will be assessed in this class:

**FELO 1e: Quantitative Reasoning:** Students will be able to solve problems that are quantitative in nature.

### **REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES**

Fundamentals of General, Organic and Biological Chemistry, by McMurry, Castellion, Ballantine, Hoeger and Peterson, Pearson, 8<sup>th</sup> Edition, **2017**. (ISBN-13: 9780134665708)  
*Required*

Modified Mastering Chemistry (Online homework platform that comes bundled with the textbook if you purchase it through the PLNU bookstore; for more information, visit [Course Materials.](#)) *Required*

Calculator: Texas Instruments TI-30XA or equivalent. *Required*

## 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 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 150 total hours meeting the course learning outcomes.

## QUIZZES AND EXAMS

Online quizzes and exams will be conducted using an external tool called Gradescope, which will facilitate rapid evaluation and feedback on your work.

To enroll in the Gradescope course:

1. Navigate to the [Gradescope website](#).
2. Click on **Sign up** (at the top right), then **Student**.
3. Enter the following **Course Entry Code**: MEYE4P.
4. Enter your **Name**, **PLNU Email Address**, and **PLNU Student ID**.

## COURSE SCHEDULE AND ASSIGNMENTS

Note: This schedule is subject to change. Any substantial changes (i.e. changes to anything other than *Details* or *Readings*) will be announced on the *Announcements* page in Canvas, and modified here in the *Syllabus*. Up-to-date reading assignments will also be listed in each Week Overview.

WEEK	ACTIVITY	DETAILS	READING/NOTES
1	Online lecture videos	<ul style="list-style-type: none"><li>• Course Introduction</li><li>• States of matter</li><li>• Representing Chemical Change</li></ul>	<ul style="list-style-type: none"><li>• Syllabus</li><li>• <math>\delta</math>1.2</li><li>• <math>\delta</math>1.5</li></ul>
	Week 1 Discussion	"Introductions"	Due Mon/Wed*
	Zoom session (Wed)	Getting acquainted & classifying matter	$\delta$ 1.3-1.4
	Mastering Chemistry	"Week 1 Assignment"	Due Thursday at 5 pm
2	Online lecture videos	<ul style="list-style-type: none"><li>• Scientific measurements</li><li>• Unit conversions &amp; density</li></ul>	<ul style="list-style-type: none"><li>• <math>\delta</math>1.6-1.9</li><li>• <math>\delta</math>1.10, 1.12</li><li>• <math>\delta</math>2.1-2.2</li></ul>

		<ul style="list-style-type: none"> <li>• Atoms and subatomic particles</li> <li>• Atomic &amp; isotopic mass</li> </ul>	<ul style="list-style-type: none"> <li>• <math>\delta 2.3</math></li> </ul>
	Zoom session	Solving unit conversions problems	$\delta 1.6-1.9, \delta 1.10, 1.12$
	Mastering Chemistry	"Week 2 Assignment"	Due Thursday at 5 pm
	Quiz 1 (Fri)		Chapter 1
3	Online lecture videos	<ul style="list-style-type: none"> <li>• The periodic table</li> <li>• Atomic structure</li> <li>• Ionic Compounds</li> <li>• Covalent bonds</li> </ul>	<ul style="list-style-type: none"> <li>• <math>\delta 2.4, 2.5</math></li> <li>• <math>\delta 2.6-2.9</math></li> <li>• Chapter 3</li> <li>• <math>\delta 4.1-4.4</math></li> </ul>
	Week 3 Discussion	"Preparing for Exam 1"	Due Mon/Wed*
	Zoom session (Wed)	Solving atomic structure problems	Chapter 2
	Mastering Chemistry	"Week 3 Assignment"	Due Thursday at 5 pm
4	Online lecture videos	<ul style="list-style-type: none"> <li>• Drawing Lewis dot structures</li> <li>• VSEPR and molecular shape</li> <li>• Electronegativity and polarity</li> </ul>	<ul style="list-style-type: none"> <li>• <math>\delta 4.6, 4.7</math></li> <li>• <math>\delta 4.8</math></li> <li>• <math>\delta 4.9, 4.10</math></li> </ul>
	Zoom session (Wed)	Drawing molecules: Lewis structures and VSEPR	Chapter 4
	Mastering Chemistry	"Week 4 Assignment"	Due Thursday at 5 pm
	<b>Exam 1</b> (Fri)		Chapters 1-4
5	Online lecture videos	<ul style="list-style-type: none"> <li>• Balancing chemical equations.</li> <li>• Moles and molecular weight</li> <li>• Reaction energy diagrams</li> <li>• Equilibria</li> </ul>	<ul style="list-style-type: none"> <li>• <math>\delta 5.1, 5.2</math></li> <li>• <math>\delta 6.1-6.4</math></li> <li>• <math>\delta 7.1, 7.5, 7.6</math></li> <li>• <math>\delta 7.7-7.9</math></li> </ul>
	Week 5 Discussion	"Mindset"	Due Mon/Wed*

	Zoom session (Wed)	Balancing equations, solving mass-to-mass conversion problems, and drawing reaction diagrams	Chapters 5-7
	Mastering Chemistry	"Week 5 Assignment"	Due Thursday at 5 pm
6	Online lecture videos	<ul style="list-style-type: none"> <li>Solutions &amp; solubility</li> <li>Calculating concentration</li> <li>Dilutions</li> <li>Electrolytes &amp; Osmolarity</li> </ul>	<ul style="list-style-type: none"> <li>§9.1-9.3</li> <li>§9.6</li> <li>§9.7</li> <li>§9.8, 9.10</li> </ul>
	Zoom session (Wed)	Calculating concentration	§9.6-9.7
	Mastering Chemistry	"Week 6 Assignment"	Due Thursday at 5 pm
	Quiz 2 (Fri)		Chapters 5-7, 9
7	Online lecture videos	<ul style="list-style-type: none"> <li>Acid-base reactions</li> <li>Equilibrium recap &amp; pKa</li> <li>pH</li> </ul>	<ul style="list-style-type: none"> <li>§10.1-10.2</li> <li>§10.3</li> <li>§10.4-10.6</li> </ul>
	Week 7 Discussion	"Preparing for Exam 2"	Due Mon/Wed*
	Zoom session (Wed)	Predicting acid strength and calculating pH	§10.3-10.6
	Mastering Chemistry	"Week 7 Assignment"	Due Thursday at 5 pm
8	Online lecture videos	<ul style="list-style-type: none"> <li>Drawing organic structures</li> <li>Isomers</li> <li>Naming alkanes</li> <li>Intermolecular forces</li> </ul>	<ul style="list-style-type: none"> <li>§12.1-12.2, 12.4</li> <li>§12.3</li> <li>§12.6</li> <li>§8.2, 12.7</li> </ul>
	Zoom session (Wed)	Intro to Organic Chemistry	Chapter 12
	Mastering Chemistry	"Week 8 Assignment"	Due Thursday at 5 pm
	<b>Exam 2 (Fri)</b>		Chapters 5-7, 9, 10, 12

9	Online lecture videos	<ul style="list-style-type: none"> <li>Organic functional groups</li> <li>Naming alkenes &amp; alkynes</li> <li>Isomers, part II</li> <li>Naming alcohols &amp; ethers</li> <li>Intermolecular forces, part II</li> </ul>	<ul style="list-style-type: none"> <li><math>\delta</math>12.2, <i>flip through 13.8, 14.1, 14.5, 14.7-14.9</i></li> <li><math>\delta</math>13.2-13.3</li> <li><math>\delta</math>13.3</li> <li><math>\delta</math>14.2, 14.7, 14.9</li> <li><math>\delta</math>14.3, <i>review <math>\delta</math>8.2</i></li> </ul>
	Week 9 Discussion	TBD	Due Mon/Wed
	Zoom session (Wed)	Alkenes, alkynes, alcohols & ethers	Chapters 13-14
	Mastering Chemistry	"Week 9 Assignment"	Due Thursday at 5 pm
10	Online lecture videos	<ul style="list-style-type: none"> <li>Naming aldehydes &amp; ketones</li> <li>Oxidation &amp; reduction of organic molecules</li> <li>Naming &amp; classifying amines</li> <li>Acid-base reactions of amines</li> </ul>	<ul style="list-style-type: none"> <li><math>\delta</math>15.2</li> <li><math>\delta</math>14.4, 15.5, 15.6</li> <li><math>\delta</math>16.2</li> <li><math>\delta</math>16.5, 16.6</li> </ul>
	Zoom session (Wed)	Amines, ketones & aldehydes	Chapters 15-16
	Mastering Chemistry	"Week 10 Assignment"	Due Thursday at 5 pm
	Quiz 3 (Fri)		Chap 13-16
11	Online lecture videos	<ul style="list-style-type: none"> <li>Naming carboxylic acid derivatives</li> <li>Acid-base reactions of carboxylic acids</li> <li>Formation and hydrolysis of amides and esters</li> </ul>	<ul style="list-style-type: none"> <li><math>\delta</math>17.1</li> <li><math>\delta</math>17.2</li> <li><math>\delta</math>17.3, 17.4</li> </ul>
	Week 11 Discussion	TBD	Due Mon/Wed*

	Zoom session (Wed)	Carboxylic acid derivatives	Chapter 17
	Mastering Chemistry	"Week 11 Assignment"	Due Thursday at 5 pm
12	Online lecture videos	<ul style="list-style-type: none"> <li>• Amino acids &amp; peptides</li> <li>• Protein structure</li> <li>• Protein function, classes of enzymes</li> </ul>	<ul style="list-style-type: none"> <li>• <math>\delta</math>18.3-18.5</li> <li>• <math>\delta</math>18.6-18.10</li> <li>• <math>\delta</math>18.2, 19.1-19.4</li> </ul>
	Zoom session (Wed)	Proteins	Chapter 18
	Mastering Chemistry	"Week 12 Assignment"	Due Thursday at 5 pm
	<b>Exam 3</b> (Fri)		Chapters 13-18
13	Online lecture videos	<ul style="list-style-type: none"> <li>• Chirality &amp; Fischer projections</li> <li>• Isomers, part III</li> <li>• Classifying sugars</li> <li>• Biologically important sugars</li> </ul>	<ul style="list-style-type: none"> <li>• <math>\delta</math>14.10, 20.2</li> <li>• 14.10</li> <li>• <math>\delta</math>20.1-20.3</li> <li>• <math>\delta</math>20.4, 20.6, 20.7</li> </ul>
	Week 13 Discussion	TBD	Due Mon/Wed*
	Zoom session (Wed)	Sugars & chirality	Chapter 20
	Mastering Chemistry	"Week 13 Assignment"	Due Thursday at 5 pm
14	Online lecture videos	<ul style="list-style-type: none"> <li>• Types of lipids</li> <li>• Membranes</li> <li>• Reactions of lipids</li> </ul>	<ul style="list-style-type: none"> <li>• <math>\delta</math>23.1-23.3, 23.5, 23.6</li> <li>• <math>\delta</math>23.7</li> <li>• <math>\delta</math>23.4</li> </ul>
	Zoom session (Wed)	Lipids & Oreos	Chapter 23
	Mastering Chemistry	"Week 14 Assignment"	Due Thursday at 5 pm
	Quiz 4 (Fri)		Chapters 20, 23
15	Online lecture videos	<ul style="list-style-type: none"> <li>• Nucleic acids</li> <li>• Base pairs</li> </ul>	<ul style="list-style-type: none"> <li>• <math>\delta</math>26.1-26.3</li> <li>• <math>\delta</math>26.4</li> </ul>

	Week 15 Discussion	"Course Favorite"	Due Mon/Wed*
	Zoom session (Wed)	Nucleic acids & Exam review	Chapter 26
	Mastering Chemistry	"Week 15 Assignment"	Due Thursday at 5 pm
	<b>Comprehensive Final Exam</b>	4:30 - 7 pm, Friday, December 4th	

\*Online discussions have two due dates. Your first original post is due by Monday at midnight. You should also respond to at least three other students' posts by Wednesday at midnight.

### ASSESSMENT AND GRADING

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

Lecture video quizzes & Participation	15%
Online homework (Mastering Chemistry)	15%
Quizzes	15%
Midterm exams	35%
Final exam (ACS standardized exam)	20%

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:

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](#) 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 class 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](#) 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](mailto: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 (a) 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**

This course is being taught in the hybrid format, which means that you will engage with your fellow classmates and instructor in real time during weekly *synchronous* class meetings on Zoom and you will engage with other material *asynchronously* online. You will have weekly **Zoom meetings** (focused on group work and problem solving), **online lecture videos** (with embedded quizzes), periodic **online discussions**, four **quizzes**, three **midterm exams**, and a comprehensive **final exam**.

Regular and punctual attendance at all **synchronous** 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 instructor 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 addition, 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. Three days of attendance (one Zoom, and two online) are required each week. (The online days may be any day during the 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](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.