



CHEMISTRY DEPARTMENT

CHE 4066 - Bioinorganic chemistry

2 units – Quad 1 Spring 2024

WELCOME TO CHE 4066:

Chemistry 4066 is an advanced course that will introduce some important concepts of a growing field in chemistry: bioinorganic chemistry. I'm glad you are here and I look forward to helping you discover the importance of this subject.

INSTRUCTOR:

Dr. Matthieu Rouffet
Office: Rohr Science 340
Phone: 619-849-3278
Email: matthieurouffet@pointloma.edu

Office Hours:

WF 10:30 – 12:00 pm
and by appointment

LECTURE:

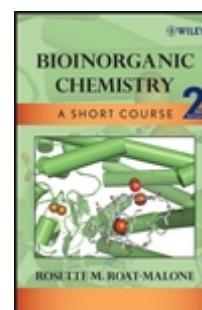
MWF 1:30 pm – 2:35 pm

Latter 102



TEXTBOOK:

- Bioinorganic chemistry, by Rosette M. Roat-Malone, Wiley 2nd Edition, 2007. (ISBN: 978-0-471-76113-6)
Required.



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 becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

COURSE DESCRIPTION

Development of significant topics in bioinorganic chemistry particularly those at the interface of chemistry and biology. Emphasis is placed on understanding the role of metals in biological systems such as enzymes and DNA.

COURSE GOALS and LEARNING OUTCOMES

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

- Explain the behavior of transition metal in biological environment
- Define the make-up and the properties of proteins, DNA/RNA and zinc fingers
- Describe the different instrumental methods used to identify bioinorganic systems
- Explore and present several important bioinorganic systems
- Identify how to inhibit metalloenzymes
- Discover the drug development process

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. For this course, the final examination will take the form of an oral presentation given in class.

ADMINISTRATION

Exams and Quizzes: Two quizzes, 3 homework sets and one oral presentation will be given during the semester. Make-up exams will be arranged only if the instructor is contacted prior to the scheduled exam time and then only if you present an institutionally valid excuse. There will be no make-up quizzes.

EVALUATION

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

- | | |
|-----------------------------|-----|
| ➤ Homework | 30% |
| ➤ Quizzes (x2) | 30% |
| ➤ Oral presentation/project | 40% |

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⁻ 90 – 92.9 %	A 93 – 100 %	
B⁻ 80 – 82.9 %	B 83 – 86.9 %	B⁺ 87 – 89.9 %
C⁻ 70 – 72.9 %	C 73 – 76.9 %	C⁺ 77 – 79.9 %
D⁻ 60 – 62.9 %	D 63 – 66.9 %	D⁺ 67 – 69.9 %
F < 59.9 %		

CHEMISTRY 4066 TENTATIVE CLASS SCHEDULE

WEEK	DATE	LECTURE TOPICS	READINGS
Week 1	Mon 01/09	Introduction/syllabus/course overview	////////////////////////////////////
	Wed 01/10	Chapter 1 metals in the body/ trace elements	Chapter 1
	Fri 01/12	Presentations metal deficiency	Chapter 1
Week 2	Mon 01/15	MLK Day	////////////////////////////////////
	Wed 01/17	Iron case study Chapter 1_part 1: hard and soft principle + Electron configuration + Homework 1	Chapter 1
	Fri 01/19	Chapter 1_part 2: shape of d orbitals/splitting in a ligand field + chapter 2 (protein structure)	Chapter 2
Week 3	Mon 01/22	Chapter 2_2: analyzing several metalloenzymes	Chapter 2
	Wed 01/24	Presentation of the project on the different metalloenzymes + QUIZ 1	Chapter 2
	Fri 01/26	Chapter 2_part 2: protein sequencing +	Chapter 2
Week 4	Mon 01/29	Chapter 2_part 3: DNA: cisplatin	Chapter 2
	Wed 01/31	Chapter2_3: DNA/G quadruplex/cisplatin + Homework 2	Chapter 2
	Fri 02/02	Chapter 2: zinc finger and hoogsten base pairs Chapter 3: NMR class (basic intro)	Chapter 3
Week 5	Mon 02/05	Chapter3: 2D NMR, NMR vs X-ray. EPR + group work	////////////////////////////////////
	Wed 02/07	X-ray class. Dr. Jacob Milligan. Pfizer	////////////////////////////////////
	Fri 02/09	Chapter 3: 2D NMR, NMR vs X-ray.	Chapter 3
Week 6	Mon 02/12	Chapter 3: 2D NMR, NMR vs X-ray. Assign paper presentations	Chapter 3

	Wed 02/14	QUIZ 2	////////////////////////////////////
	Fri 02/16	PYMOL + Inhibitor studies. + Homework 3	////////////////////////////////////
Week 7	Mon 02/18	Chapter ZBG: introduction of the different ZBG FDA approved drugs	////////////////////////////////////
	Wed 02/21	Group Presentations 1	
	Fri 02/23	Group Presentations 2	
Week 8	Mon 02/25	Group presentations 3	

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.

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 POLICY

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.

Catalog. See Academic Policies for definitions of kinds of academic dishonesty and for further policy information.

ARTIFICIAL INTELLIGENCE POLICY

You are allowed to use Artificial Intelligence (AI) tools (e.g, ChatGPT, iA Writer, Marmot, Botowski) to generate ideas, but you are not allowed to use AI tools to generate content (text, video, audio, images) that will end up in any work submitted to be graded for this course. If you have any doubts about using AI, please gain permission from the instructor.

PLNU ACADEMIC ACCOMMODATION 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.

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.

You may report an incident(s) using the Bias Incident Reporting Form.

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. 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 or find a list of campus pastors at pointloma.edu/title-ix.

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.

LOMA WRITING CENTER

The Loma Writing Center exists to help all members of the PLNU community cultivate transferable writing skills to engage their academic, professional, personal, and spiritual communities. We work toward this goal by conducting one-on-one consultation sessions, supporting writing education across the PLNU community, and participating in ongoing writing center research.

Getting feedback from the Loma Writing Center while you’re in the process of working on an assignment is a great way to improve the quality of your writing and develop as a writer. You are encouraged to talk with a trained writing consultant about getting started on an assignment, organizing your ideas, finding and citing sources, revising, editing for grammar and polishing final drafts, and more. For information about how to make in-person or online appointments, see [Loma Writing Center webpage](#) or visit the Loma Writer Center on the first floor of the Ryan Library, room 221.