

Point Loma Nazarene University  
Department of Chemistry

**CHE468 – Advanced Inorganic Chemistry II  
Spring Term, 2020**

MWF, 7:25 – 8:20 pm in LA 102

Dr. Laurance G. Beauvais  
lbeauvais@pointloma.edu  
Office hours: MW, 12:30 – 2:00 pm; T, noon – 1:00 pm; F, 12:15 – 1:30 pm.

Sator 206  
(619) 849-3251

*Prerequisite*

Successful completion of CHE3026 is required.

**Course Description**

The principles of inorganic chemistry, including symmetry, atomic and molecular structure, bonding theories, energetics, kinetics, and spectroscopy, are developed and applied to a range of inorganic compounds.

**Course Objectives**

At the completion of this course, students will be able to:

- predict and explain electronic configurations, periodic trends, and structures of simple main-group compounds.
- assign point groups for molecules and ions, and use group theory to build qualitative molecular orbital diagrams and identify Raman and IR active modes.
- apply acid-base and donor-acceptor principles to understand reactivity of inorganic compounds.
- know the fundamentals of coordination chemistry, including nomenclature, isomerism, ligand field theory, molecular orbitals, ligands, and electronic spectroscopy.

*Textbook*

*Inorganic Chemistry*, Miessler, Fischer, and Tarr, 5<sup>th</sup> edition, Pearson, 2014.

*Lecture Materials*

Lecture materials and other useful information will be available on Canvas.

*Presentation*

Each student will deliver a 15–20 minute presentation discussing one of the prominent inorganic chemists interviewed for the *Voice of Inorganic Chemistry* program. The interviews are available at <http://pubs.acs.org/page/inocaj/multimedia/voices.html>. More details will be forthcoming regarding this assignment.

*Problem Sets*

Problem sets are due at the beginning of class on the day indicated on the assignment. Late work will not be accepted.

### *Grading*

The final grade will be determined as follows:

Problem Sets	15%
Presentation	10%
In-Class Activities	10%
Midterm Exams	30%
Final Exam	35%

Letter grades will be determined at the end of the semester.

### **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.

### **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 [Class Schedules](#) site. No requests for early examinations or alternative days will be approved.

### **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**

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in 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. See [Academic Policies](#) in the Undergraduate Academic Catalog.

**Topics and associated reading (timetable is a best estimate of course progress)**

Week (Dates)	Topic
1 (1/14 – 1/17)	<b>The Elements, Atomic Structure, and Periodic Properties</b> Reading: Chapter 2
2 (1/20 – 1/24)	<b>Lewis Structures and Redox Chemistry</b> Reading: Lewis Structures (chapter 3) Reading: Redox chemistry (handout)
3 (1/27 – 1/31)	<b>Redox Chemistry and Ionic Bonding</b> Reading: Chapter 7, sections 1 & 2
4 (2/3 – 2/7)	<b>Symmetry and Group Theory</b> Reading: Chapter 4
5 (2/10 – 2/14)	<b>Molecular Orbital Theory</b> Reading: Chapter 5
6 (2/17 – 2/21)	<b>Exam 1</b> <b>Acids &amp; Bases</b> Reading: Chapter 6
7 (2/24 -2/28)	<b>Introduction to Coordination Chemistry</b> Reading: Chapter 9
8 (3/2 – 3/6)	<b>Crystal Field Theory and Ligand Field Theory</b> Reading: Chapter 10
	<b>Spring Break 3/9 – 3/14</b>
9 (3/16 – 3/20)	<b>Electronic Spectroscopy</b> Reading: Chapter 11
10 (3/23 – 3/27)	<b>Reactions and Mechanisms</b> Reading: Chapter 12
11 (3/30 – 4/3)	<b>Review and Exam 2</b>
12 (4/6 – 4/10)	<b>Organometallic Chemistry</b> Reading: Chapter 13
13 (4/13 – 4/17)	<b>Organometallic Reactions and Catalysis</b> Reading: Chapter 14
14 (4/20 – 4/24)	<b>Solid State Chemistry and Band Theory</b>
15 (4/27 – 5/1)	<b>Special Topics</b>
	<b>Final Exam Wednesday, May 6, 4:30 – 7:00 pm</b> (Chemistry Final Exam Slot)