

**Chem 6500**  
**Reactivity and Mechanisms in Inorganic Chemistry**  
**Fall 2019**

**Instructor:** Dr. Gang Li

**Office:** ML 359

**Office Hours:** By appointment

**Phone:** 435-797-0604

**Email:** [gang.li@usu.edu](mailto:gang.li@usu.edu)

**Class Time/Location:** Widtsoe 330, Mon 3:00 pm – 4:30 pm & Wed 5:30 pm – 7:00 pm

**Required Text:** None (Materials will be made available via Canvas)

**Reference Textbooks:**

a) *Advanced Inorganic Chemistry*, 6<sup>th</sup> Edition, F. A. Cotton, G. Wilkinson, C. A. Murillo, M. Bochmann, Wiley, 1999.

b) *Chemistry of the Elements*, N. N. Greenwood, A. Earnshaw, Pergamon, Oxford, UK, 1997.

c) *Reaction Mechanisms of Inorganic and Organometallic Systems*, R. B. Jordan, Oxford, New York, NY, 1997.

d) *Organotransition Metal Chemistry: From Bonding to Catalysis*, J. F. Hartwig, University Science Books, Sausalito, CA, 2010

**Prerequisites:** Chem 5520

**Grading:** A total of 600 points is possible in Chem 6500. Points are distributed as follows:

Lead Literature Discussion (4 × 30 + 30 pts)	<b>150 pts</b>
Problem Sets (5 × 50 pts)	<b>250 pts</b>
Mid-Term Exam	<b>100 pts</b>
Final Exam	<b>100 pts</b>

Exams are take-home format

**Tentative Grading Scale:**

A/A-	B+/B/B-	C+/C/C-	D+/D
90%-100%	80%-89%	70%-79%	60%-69%

## Course Content:

The purpose of this course is to provide necessary understandings of reactivities and mechanisms in inorganic chemistry relevant to main group and transition metal elements through readings and presentations on the recommended texts and current literatures. The topics that will be discussed in this course are list below. Each topic will consist of a general introduction to the topic and discussions of current literatures. Recommended texts and current research literatures will be made available on Canvas.

## Semester Schedule

Date	Topic	Literature Presentations
08/26	Basic Concepts I	
08/28	Basic Concepts II	
09/04	Hydrogen	Steve, Josiah, Maowei
09/09	Group 17 Elements I	
09/11	Group 17 Elements II	Kennedy, Liming, Qianshun
09/16	Group 16 Elements I	
09/18	Group 16 Elements II	Wenda, Qing, Liping, Tara
09/23	Group 15 Elements I	
09/25	Group 15 Elements II	Steve, Josiah, Maowei
09/30	Group 14 Elements	
10/02	Group 13 Elements	Kennedy, Liming, Qianshun
10/07	Noble Gases	
10/09	Group 1 and 2 Elements	Wenda, Qing, Liping, Tara
10/14	Coordination Chemistry I	
10/16	Coordination Chemistry II	
10/21	Group 3 Elements	
10/23	Group 4 Elements	Steve, Josiah, Maowei
10/28	Group 5 Elements	
10/30	Group 6 Elements	Kennedy, Liming, Qianshun
11/04	Group 7 Elements I	
11/06	Group 7 Elements II	Wenda, Qing, Liping, Tara
11/11	Group 8 Elements I	
11/13	Group 8 Elements II	Steve, Josiah, Maowei
11/18	Group 9 Elements I	
11/20	Group 9 Elements I	Kennedy, Liming, Qianshun
	Thanksgiving	
12/02	Group 10 Elements I	
12/04	Group 10 Elements II	Wenda, Qing, Liping, Tara
12/09	Group 11 and 12 Elements	

## Literature Discussion by Students:

Throughout the semester, each student will lead a total of 4 literature discussions. These will begin in week 2 and continue through week 15. A detailed literature discussion schedule and criteria for how the discussions will be graded will be presented in Week 1 and will also be available on Canvas. Articles for discussion will be chosen from a collection available on Canvas. Each student will be graded on your ability to effectively describe the contents of the article and answer questions, with each literature discussion being worth 30 points ( $4 \times 30 = 120$  total points). You will also engage in literature discussions as a participant, with your performance being evaluated to earn up to 30 points. Total points for literature discussion will be 150.

## Assignment Schedule

Assignments	Post Date	Due
Problem Set I	09/09	09/16
Problem Set II	09/23	09/30
<b>Midterm Exam</b>	<b>10/09</b>	<b>10/21</b>
Problem Set III	10/21	10/28
Problem Set IV	11/04	11/11
Problem Set V	11/18	12/02
<b>Final Exam</b>	<b>12/04</b>	<b>5 pm, 12/13</b>

## Exams and Problem Sets

Exams and problem sets will have research type problems. Each student is expected to work the exam on your own and bring any questions to the instructor. Late assignments will not be accepted unless permission obtained in advance.

All assignments are to be completed and submitted prior to the starting of the Monday class session right after the week posted unless specified.

## Academic Integrity – “The Honor System”:

The University expects that students and faculty alike maintain the highest standards of academic honesty. The Code of Policies and Procedures for Students at Utah State University ([Student Conduct](#)) addresses academic integrity and honesty and notes the following:

**Academic Integrity:** Students have a responsibility to promote academic integrity at the University by not participating in or facilitating others' participation in any act of academic dishonesty and by reporting all violations or suspected violations of the Academic Integrity Standard to their instructors.

**The Honor Pledge:** To enhance the learning environment at Utah State University and to develop student academic integrity, each student agrees to the following Honor Pledge:

"I pledge, on my honor, to conduct myself with the foremost level of academic integrity". Violations of the Academic Integrity Standard (academic violations) include, but are not limited to cheating, falsification, and plagiarism

### **Plagiarism:**

Plagiarism includes knowingly "representing by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials." The penalties for plagiarism are severe. They include warning or reprimand, grade adjustment, probation, suspension, expulsion, withholding of transcripts, denial or revocation of degrees, and referral to psychological counseling.

### **Grievance Process (Student Code):**

Students who feel they have been unfairly treated [in matters other than discipline, admission, residency, employment, traffic, and parking - which are addressed by procedures separate and independent from the Student Code] may file a grievance through the channels and procedures described in the Student Code: [Article VII Grievances](#)

### **Students with Disabilities:**

USU welcomes students with disabilities. If you have, or suspect you may have, a physical, mental health, or learning disability that may require accommodations in this course, please contact the Disability Resource Center (DRC) as early in the semester as possible (University Inn # 101, 435-797-2444, [drc@usu.edu](mailto:drc@usu.edu)). All disability related accommodations must be approved by the DRC. Once approved, the DRC will coordinate with faculty to provide accommodations.

### **Withdrawal Policy, "I" Grade Policy and Dropping Courses:**

If a student does not attend a class during the first week of the term or by the second class meeting, whichever comes first, the instructor may submit a request to have the student dropped from the course. (This does not remove responsibility from the student to drop courses which they do not plan to attend.) Students who are dropped from courses will be notified by the Registrar's Office through their preferred e-mail account.

Students may drop courses without notation on the permanent record through the first 20 percent of the class. If a student drops a course following the first 20 percent of the class, a W will be permanently affixed to the student's record (check [General Catalog](#) for exact dates).

Students with extenuating circumstances should refer to the policy regarding Complete Withdrawal from the University and the Incomplete (I) Grade policy in the General Catalog.