

Chem 301 Descriptive Inorganic Chemistry

Spring 2018

3 Credits

Syllabus

Meeting Time: MWF 9:10 -10:00

Room: Troy G005

Prerequisite: Chem 106 with a C or better

Instructor: Jeremy Lessmann

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Office Hours: W 10-11, Tu 9:30-10:30

Course website: The course will use the Blackboard learning management system

Course Materials: Required text: Descriptive Inorganic Chemistry, Geoff Rayner-Canham and Tina Overton, 6th Ed., Freeman, 2014 (ISBN : 978-1-4641-2557-7)

Student Learning Outcomes At the end of this course, students should be able to:	Course Topics/Dates	Evaluation of Outcome: This outcome will be evaluated primarily by:
1. Describe the organization of the elements in the periodic table based on electron configuration, atomic radii, ionization energies, and electron affinities.	Week 1	Exam 1 and Quiz 1
2. Describe and apply bonding concepts in terms of the Lewis model and the ionic model, predict shapes of molecules based on the VSEPR model, and describe ionic compounds using the basic ideas of crystal packing	Weeks 2 and 3	Exam 1 and Quiz 2
3. Apply thermodynamic principles, including lattice and bond energies, to evaluate the stability of inorganic compounds	Week 4	Exam 1 and Quiz 3
4. Distinguish and apply acid-base theories to predict the outcome of inorganic reactions		
5. Apply concepts and data relating oxidation-reduction reactions to predict the outcome of inorganic reactions	Week 5	Exam 1 and Quiz 4
6. Describe the periodic trends in reactivity.	Week 6	Exam 1 and Quiz 5
7. Describe the predominant features of the elements based on their position in the periodic table (hydrogen, Groups 1, 2, 13, 14, 15, 16, 17, and 18)	Weeks 7-11	Exam 2 and Quizzes 6-10
8. Describe and name the structures commonly observed for transition metal complexes.	Week 12	Exam 2 and Quiz 11
9. Describe the predominant structural features and reactivity of the compounds of the 3d transition metals.	Week 12 and 13	Exam 2 and Quiz 12
10. Describe the predominant structural features and reactivity of the compounds of the 4d and 5d transition metals.	Weeks 13 and 14	Exam 2 and Quiz 12
11. Describe the predominant structural features and reactivity of the compounds of the Group 12 metals.		Final Exam
12. Recognize common, stable organometallic transition metal compounds.	Week 14	Final Exam
	Week 14	All topics will be re-evaluated by the final exam.

Assignments There will be ungraded in-class exercises and follow-up assignments. The answer keys for these will be posted on Blackboard but they will not be graded. There will be two in-class hour exams and twelve in-class quizzes as well as a comprehensive final. Of the twelve quizzes, ten will count towards the final grade with lowest two scores dropped. There will be no make ups quizzes. There will be ten (14?) homework assignments that will come primarily from the textbook and they will be due on Wednesday and cover the material through the previous Friday. The quizzes on the same material will be on the following Friday.

Grading Policy

2 Hour Exams	2 X 150	300 points
10 Best Homework	10 X 25	250
10 Best Quizzes	10 X 20	200
Final	250	250
Total		1000 points

Grades are based on the total points and will be no lower than an A for 90-100%, a B for 80-90%, a C for 70-80% and a D for 60-70%. There will also be + and - grades.

Week to week course outline with topics and assignments (Since this is the first time this course has been taught some topics may shift or be changed as needed.)

Week	Reading topics	Assignments and Exams
1: Jan.8 – 12	Chptr. 1 The Electronic Structure of the Atom: A Review Chptr. 2 The Structure of the Periodic Table	None
2: Jan. 15* - 19	Chptr. 3 Covalent Bonding and Molecular Spectroscopy	Homework 1 (W), Quiz 1 (F)
3: Jan. 22 – 26	Chptr. 4 Metallic Bonding and Alloys (4.1,4.3, 4.4) and Chptr. 5: Ionic Bonding and Solid-State Structures (5.1-5.4)	Homework 2(W), Quiz 2 (F)
4: Jan. 29 – Feb. 2	Chptr. 6 Why Compounds Exist - Inorganic Thermodynamics	Homework 3 (W), Quiz 3 (F)
5: Feb. 5 – 9	Chptr. 7 Solvent Systems and Acid-Base Behavior	Homework 4 (W), Quiz 4 (F)
6: Feb. 12 – 16	Chptr. 8 Oxidation and Reduction (8.1 – 8.9)	Homework 5 (W), Quiz 5 (F)
7: Feb. 19* – 23	Chptr. 9 Periodic Patterns Chptr. 10 Hydrogen Chptr. 11 The Group 1 Elements: The Alkali Metals (11.1 – 11.6)	Homework 6 (W), Exam 1 (Chapters 1 through 8) (F)
8: Feb. 26 – March 2	Chptr. 11 The Group 1 Elements: The Alkali Metals (11.7 – 11.14) Chptr. 12 The Group 2 Elements: The Alkaline Earth Metals Chptr. 13 The Group 13 Elements (13.1 – 13.5)	Homework 7 (W), Quiz 6
9: March 5 – 9	Chptr. 13 The Group 13 Elements (13.6 – 13.11) Chptr. 14 The Group 14 Elements	Homework 8 (W), Quiz 7 (F)
March 12 – 16	Spring Vacation	
10: March 19 – 23	Chptr. 15 The Group 15 Elements: The Pnictogens Chptr. 16 The Group 16 Elements: The Chalcogens (16.1 – 16.8)	Homework 9 (W), Quiz 8 (F)
11: March 26 – 30	Chptr. 16 The Group 16 Elements: The Chalcogens (16.9 – 16.22)	Homework 10 (W), Quiz 9 (F)

	Chptr. 17 The Group 17 Elements: The Halogens Chptr. 18 The Group 18 Elements: The Noble Gases	
Week	Reading topics	Assignments and Exams
12: April 2 – 6	Chptr. 19 Transition Metal Complexes (19.1 – 19.5, 19.14-19.15) Chptr. 20 The 3d Transition Metals (20.1 – 20.10)	Homework 11 (W), Quiz 10 (F)
13: April 9 – 13	Chptr. 20 The 3d Transition Metals (20.11 – 20.13) Chptr. 21 The 4d and 5d Transition Metals (21.1 – 21.6)	Homework 12 (W), Exam 2 (Chapters 9 through 20.10) (F)
14: April 16 - 20	Chptr. 21 The 4d and 5d Transition Metals (21.7 – 21.12) Chptr. 22 The Group 12 Elements	Homework 13 (W), Quiz 11(F)
15: April 23 - 27	Chptr 23 Organometallic Chemistry (selected topics) and Review	Homework 14 (W), Quiz 12 (F)
16: May 1	Tuesday 8-10	Comprehensive Final Exam

*Jan. 15 is the Martin Luther King holiday, February 19 is the President's Day holiday

Attendance policy

Regular attendance is expected in order to be successful in this course. If you know that you will miss an exam, quiz, in class problem, or the due date for a homework assignment for reasons beyond your control, you are expected to make arrangements in advance for any accommodation that may be possible. In general, late exams or quizzes are not available.

Students with Disabilities

Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. For more information contact a Disability Specialist.

Academic Integrity

I encourage you to work with classmates on assignments. However, each student must turn in original work. No copying will be accepted. Students who violate WSU's Standards of Conduct for Students will receive a zero on the assignment and may receive an F as a final grade in this course, and will be reported to the Office Student Standards and Accountability. Cheating is defined in the Standards for Student Conduct WAC 504-26-010 (3). It is strongly suggested that you read and understand these definitions.

Safety and Emergency Notification

Washington State University is committed to enhancing the safety of the students, faculty, staff, and visitors. It is highly recommended that you review the Campus Safety Plan (<http://safetyplan.wsu.edu/>) and visit the Office of Emergency Management web site (<http://oem.wsu.edu/>) for a comprehensive listing of university policies, procedures, statistics, and information related to campus safety, emergency management, and the health and welfare of the campus community.