

**Inorganic Chemistry  
Keene State College  
Spring 2018**

**Course:** Inorganic Chemistry (CHEM 363)  
**Times:** MWF 9:20-10:30 AM  
**Location:** Science 301  
**Laboratory:** Thursday 2:00-4:50 pm, Science Center Room 207  
**Prerequisites:** CHEM 221, CHEM 222, CHEM 341 or CHEM 342, or permission of instructor

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**Instructor:** Professor Brian Anderson  
**Office:** Science Center 234  
**Email:** [banderson1@keene.edu](mailto:banderson1@keene.edu)  
**Phone:** 603-358-2560, or 8-2560 from a campus phone

**Office Hours:** Tuesday 11:00-12:00 PM and Wednesday 1:00-2:00 PM, Please stop by, I'm here to help you! Additionally, we will have an optional **problem solving session** immediately following lab on Thursdays from 5:00-6:00 PM in Science 207.

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**Course Materials**

**Website:** **Canvas:** <https://keene.instructure.com/> I will post the syllabus, lecture slides, assignments, grades, and other class material. It is expected you will check Canvas at least once a day for announcements and assignments.

**Textbook:** *Inorganic Chemistry 6th Edition*, by Shriver, Weller, Overton, Rourke, and Armstrong published by W.H. Freeman) and companion website

**Resources:** Organic Chemistry Lab Manual (*Experimental Organic Chemistry*, Blatchly and Junge).  
*Chemistry 341 Lecture Outline*, Dr. Jerry Jasinski

**Other:** Scientific Calculator  
Appropriate Lab attire (see Lab manual for details)

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**Course Description and Structure**

**KSC Catalog:** "An introduction to modern inorganic chemistry, including a description of transition-metal complexes and their role as catalysts, and a survey of the reactivity of selected elements of the main group. Three-hour lecture, three-hour laboratory."

CHEM 363 will cover the study of bonding, structure, physical and chemical properties, and chemical reactions of inorganic compounds. Examples will be drawn from main group and transition metal compounds.

The course will include a mix of traditional lecture and interactive small group inquiry-based work sessions. The grading aspects of the course will include in-class small group work sessions, in-class exams, selected assignments following inquiry-based work sessions, required classroom attendance and out-of-class textbook or other assignments.

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## Grading

There will be four in class exams that will account for forty-four percent of your overall grade, as well as a final exam that will be cumulative. Additionally there will be periodic quizzes and homework assignments. These will be announced in class and/or on Canvas. The tables below shows the breakdown of how much the assignments are worth, as well as a table illustrating the grading scale that will be used. **A failure in the laboratory represents a failure in the overall course.**

Assignment	Weight	Grading Scale			
Exams (four total)	48%	4.0 (A)	90.0-100	2.0 (C)	70.0-74.9
Quizzes/Homework	12%	3.5 (AB)	85.0-89.9	1.5 (CD)	65.0-69.9
Participation	5%	3.0 (B)	80.0-84.9	1.0 (D)	60.0-64.9
Laboratory	20%	2.5 (BC)	75.0-79.9	0.0 (F)	<60
Final Exam	15%				

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## Attendance Policy

All exams, quizzes, and inquiry-based activities must be taken at the prescribed time except for good reason (e.g. class field trips, away games) and must be cleared with me in advance (except for serious situations which could not be anticipated). Going away early for vacation or having other assignments are not good reasons; you know when you will have exams and assignments, plan ahead. **Make up quizzes and exams will only be given for college sponsored events or official excuses.**

**Attendance is mandatory** for this course. Attendance will be taken and at all lectures and laboratory sessions and will be taken at the beginning of each class. As stated in the KSC academic policies (<http://www.keene.edu/registrar/policy/attendance/>),

“A student who misses in excess of three weeks of classes prior to the eleventh week of the semester (for any reason whatsoever) must withdraw from the course. The student must follow the regular withdrawal procedure. The faculty member may waive this policy at his or her discretion, but if the faculty member wishes to enforce the policy, he/she will inform the student in writing, who then must initiate the withdrawal. A student so notified who fails to withdraw from the course will be given an F for the course.”

**There will be no make-ups given for missed laboratories. Two or more unexcused laboratory absences will result in an automatic failure in the course.**

Make-up exams will be allowed ONLY under extreme circumstances as outlined by Keene State College policy and ONLY by prior approval **from your instructor at one specified date, April 29th**, unless otherwise determined by the instructor.

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### Exams/Quizzes/Homework

YOU are responsible to bring a calculator, pen or pencil, and KSC ID to each exam. ALL CELL PHONES MUST BE OFF and stored during exam. **ANY use of a cell phone during a quiz/exam will result in penalties.**

**Exams:** There will be four in class exams. These will consist of a combination of multiple choice, short answer, quantitative calculations, chemical structures, multistep problems or more. The in class exams will have 70 minutes for completion. Material on any previous exam may be tested on the following exam(s). There will be a comprehensive final exam on at the scheduled time during exam week.

**Quizzes/homework:** There will be periodic in class quizzes and homework during the semester. Often questions will be similar or the same as those assigned in the textbook (watch for these!). Homework problems may also appear on exams.

**Practice Problems:** Practice problems from each chapter will be assigned. I will not collect these but they are required. Problems will be selected to reinforce material covered in class and help prepare you for quizzes and exams. If you find a particular type of problem difficult, find unassigned problems of that type to practice. *Chemistry is learned by doing problems, experimenting in lab, working with peers, making mistakes trying someone else's approach, and finally become proficient.*

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### Deadlines

**All deadlines for assignments will be strictly enforced**, unless previously cleared with the instructor. Any material turned in late will immediately result in an automatic 20% reduction of grade. An additional 10% will be lost for each day the assignment is late. **No assignments will be accepted past one week of the due date.**

For example, if an assignment is due on a Friday but not turned in until Tuesday, the grade of the assignment will be reduced by 50 %, so a score of a 86 would be reduced to a 43.

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### Academic Integrity

All students will be held strictly accountable for adhering to Keene State College's policies regarding academic integrity (<http://www.keene.edu/policy/academichonesty.cfm>). **Academic dishonesty, whether intentional or not, will result in a failure for the course and a formal charge reported to the Dean of Sciences.** Students and the instructor will be required to be respectful of everyone in the classroom. Cell phone use is strictly prohibited and frowned upon. **Plagiarism in any and all forms is taken very seriously and forbidden.** The work you turn in must be of your own original production, and proper citation and referencing is mandatory. If you are unsure what constitutes plagiarism consult the student handbook or your instructor.

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### Students with Special Needs

If there are students in the class who have a disability and need accommodations, please see me in private to discuss the accommodation needed. We will work with the office of disability services to coordinate proper accommodations for your needs. For more information, please visit their website at (<http://www.keene.edu/disabilitysvs/>). We should have this discussion as soon as possible before getting too far into the semester.

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### Laboratory

The labs are an integral part of this class. Some material will be introduced or mainly covered in lab. This does not mean you are not responsible for it in other settings. Classes (and quizzes and exams) will be conducted with the assumption you have learned this material and labs will be conducted with the expectation that you understand related class material. Lab attendance is mandatory. ***A failure in the laboratory represents a failure in the overall course. Not turning in laboratory reports or having two or more unexcused absences from lab will result with an automatic failure for the course.***

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### Emergency Academic Procedures:

In the event the College is impacted by an emergency situation students are responsible for regularly checking their KSC e-mail and Canvas for information from their instructors and/or the College.

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### Course Outcomes

***Students enrolled in this course are expected to:***

- Develop a detailed understanding of atomic structure and periodic trends: Atomic orbitals, ionization energy, electron affinity, shielding and effective nuclear charge.
- Develop an understanding of molecular structure and bonding: molecular geometries (symmetry point groups), valence bond theory, molecular orbital theory
- Apply understanding of molecular structure to understand chemical reactivity and physical properties: spectra, acid-base character, reactivity of elements and their compounds
- Develop an understanding of transition metal coordination complexes: stereochemistry, nomenclature, theories of bonding, thermodynamic and kinetic aspects
- Apply knowledge of bonding and structure to advanced topics such as catalysis, bioinorganic chemistry, material science
- Learn and use inorganic synthetic techniques in the synthesis and characterization of inorganic compounds
- Analyze reactions and characterize products using modern spectroscopic techniques
- Gain proficiency in scientific writing

Tentative Schedule

The following is a tentative schedule of topics we will cover with a rough schedule of dates. These are subject to change (and probably will). **Exam dates will NOT change.** The lab schedule here is subject to change, watch for in class and/or Canvas announcements.

Week of	Lecture Schedule	Tentative Lab Schedule
<b>January</b>		
15th	Chapter 1: Atomic Structure	Introduction, Safety, Review
22nd	Chapter 1: Atomic Structure Chapter 2: VSEPR and Lewis Structures	Exp 1: Introduction to Symmetry
29th	Chapter 6: Symmetry	Exp 1: Synthesis of Nitrile complexes
<b>February</b>		
5th	Chapter 2: MO theory <b>Exam 1: Friday 2/9</b>	Exp 1: Structural Investigation of Nitrile complexes
12th	Chapter 2: MO theory	Exp 2: Synthesis and resolution of a chiral Ni complex
19th	Chapter 3: Structure of simple solids	Exp 2: Synthesis and resolution of a chiral Ni complex
26th	Chapter 4: Acids and Bases <b>Exam 2: Friday 3/2</b>	TBA
<b>March</b>		
5th	Chapter 4: Acids and bases Chapter 5: Oxidation and Reduction	TBA
12th	<i>SPRING BREAK</i>	<i>SPRING BREAK</i>
19th	Chapter 5: Oxidation and Reduction	TBA
26th	Chapter 7: Coordination Chemistry <b>Exam 3: Friday 3/30</b>	TBA
<b>April</b>		
2nd	Chapter 20: d-metal complexes	TBA
9th	Chapter 20: d-metal complexes	TBA
16th	Chapter 21: Coordination Chemistry <b>Exam 4: Friday 4/20</b>	TBA
23rd	Special Topics in Inorganic Chemistry: TBA	TBA
<b>May</b>		
1st	<b>Final Exam, Friday 5/4 10:30-12:30 PM</b>	