

- Instructor:** Genette ("Gee") McGrew (gmcgrew@uvm.edu)
- Lectures:** Jan 12 – Apr 29: 11:45 am – 12:35 pm (MWF) in Angell B-112
- Office hours:** 12:45 – 1:15 pm (M & W); 10:00 – 10:30 am (W); 3:00 – 5:00 pm (Th) in Cook A-219
Also (almost!) any time by prior appointment (email me!)
- Primary text:** *Inorganic Chemistry*, 5th edition (Miessler, Fischer & Tarr). A copy of the text is requested for 2 h reserve at the library. For those of you who have access to a used 4th edition of this text, pages and problem set numbers will be included where reasonable.
- Other reading:** *Inorganic Chemistry*, 4th edition (Shriver & Atkins) has also been placed on 2 h reserve, and is recommended reference for its color illustrations.
Additional reading and work materials will be distributed on *Blackboard* (bb.uvm.edu).

Course description:

"Symmetry, group theory, molecular structure; electronic structure of atoms; bonding models including MO, crystal field, and ligand field; solid state, acid-base, and simple organometallic systems." – Course catalogue.

Chem 131 will cover some of the fundamentals of inorganic chemistry: symmetry, bonding, electronic structure, spectra, and solid state chemistry. Additionally, we will explore organometallic systems, transition-metal mediated catalysis, and bioinorganic systems.

Grading:

Attendance and participation in class exercises: Required (15 pts).

Quizzes: Each Quiz is worth 20 pts (120 pts total, ~25%).

Midterm: There is one midterm exam, worth 100 pts (~20%).

Final: The final (**May 01, 2015, Angell B112, 7:30am**) is worth 150 pts (~30%) and *will* be cumulative.

Problem Sets: Problems are not graded for *correctness*, but should still be submitted, as they are worth 15% of the total grade, and serve as crucial prep for upcoming quizzes and exams.
Excepting holidays, homework is due the following Monday (11:45 am, paper; 11:30 am, online). Collaboration with your peers is encouraged. However, all students must submit their own work.

Paper: If desired, the two lowest quiz grades (including missed quizzes) may be exchanged for a single grade on a *well-written* short paper on one Nobel Prize in Chemistry (range: 1951 – present) relevant to the topics of Inorganic Chemistry.
Additional requirements and grading criteria for the paper will be posted on BB. If you decide to write a paper, your topics must be submitted for approval by March 30.

Pop quizzes: Mini pop quizzes will be scattered into the semester to total ~5% of your grade. They will consist of a few short answer questions, and are meant to assess concept learning and attendance.

Extra Credit: There is extra credit, worth *up to* 10 pts, based off knowing your periodic table. The opportunity to earn this credit will appear unannounced near the end of the semester.

Final Grades: I use UVM's scale for assessment of letter grades. Read more at the [\[link here\]](#).

More details:

Online Resources: Reading, problem sets, answer keys, Q&A, and other course materials will be posted on Blackboard. Please log in to [\[Blackboard\]](#) for more details.

'Showing Work' Required: When a problem involves reasoning, algebraic manipulations, etc., you *must* show the work (math/logic) used in arriving at your answer in order to receive any credit for the answer.

Deadlines & Timeliness: All materials due during this course must be submitted on time.

Hard copies: placed in the rolling container inside the door by the beginning of class (11:45 am)

Electronic assignments: received by 11:30 am sharp.

Late materials are eligible for *no more than* 50% credit if received within 24 h of the deadline.

Art skills & Legibility: You do not need to be a Michelangelo in this class. However, materials submitted for evaluation must be clear and legible in order for grades to be fairly evaluated. Like practicing chairs in Organic, you should practice drawing orbitals, molecular geometries, etc. as necessary.

No Calculators: Calculators *will not* be permitted for any exam or quiz. Basic algebra or order-of-magnitude estimates may be requested; in these cases, you are required to work the math out by hand.

Key dates:

Jan 16 (F)	Last day to Add/Drop w/o Permission
Jan 19 (M)	No class (MLK Jr. Day)
Jan 23 (F)	Quiz 1
Jan 26 (M)	Add/drop deadline
Feb 06 (F)	Quiz 2
Feb 16 (M)	No class (Presidents' Day)
Feb 20 (F)	Quiz 3
Feb 27 (F)	Midterm Exam
Mar 02–06	No class (Spring Break)
Mar 20 (F)	Quiz 4
Mar 27 (F)	Withdraw deadline
Mar 30 (M)	Paper topic due
Apr 03 (F)	Quiz 5
Apr 17 (F)	Quiz 6
Apr 22 (W)	Paper Due
May 01 (F)	Final Exam (7:30 am)

Additional Information:

Academic Integrity: As part of the University academic community, students are charged with acting responsibly and honestly, in accordance with the Code of Academic Integrity. I take the Code very seriously; suspected violations will be forwarded to the Center for Student Ethics & Standards for further investigation, and may lead to a grade of XF. [\[Code of Academic Integrity\]](#)

Prereqs & reading: Inorganic chemistry builds on concepts and nomenclature learned in your prerequisite general and organic chemistry courses. I highly recommend that you acquire a(n affordable) hard copy of Miessler and Tarr and read ahead. Additionally, reviewing your previous texts will be helpful if you are worried about keeping up in this course.

Personal electronic devices: Please silence and put away all personal electronic devices (cell, tablet, DS...) for the duration of class. The sole exception to this is a laptop/tablet for work relating to class (i.e. note-taking). If you are found using electronics for non-131 purposes (youtube, fb, Candy Crush, etc.), I will ask that the device be put away for the rest of the semester.

There is a clock in the room. Thus, during quizzes and exams, the only permitted instruments on your desk are: pen(s), scratch paper (provided), handouts (provided), and quiz/exam.

Why am I filling out a Periodic Table ? I will be handing out a blank periodic table... periodically... at the beginning of class for students to write their names on and return. You are encouraged to fill it out as time permits, but you will not be penalized for leaving it blank. The primary function of the periodic table exercise – aside from practice – is for me to assess course attendance and interest.

Summary of Course Objectives:

By the end of the course, you will be expected to:

- use appropriate vocabulary and nomenclature
- be familiar with the periodic table and the trends/properties of the elements contained therein
- describe inorganic compounds, and both predict and explain the properties and behaviors of inorganic compounds based off of bonding, geometry, point groups, and symmetry.
- be familiar with spectroscopic methods used to determine geometric and electronic structure of inorganic compounds.
- count electrons in transition metal complexes and use the electron count to describe transition metal mediated processes, such as catalytic cycles.
- relate inorganic chemistry to materials science, biochemistry, environmental chemistry, and other current topics in science.

Main topics covered in this course:

Topics and chapter of Inorganic Chemistry, in order of coverage:

- History, atomic structure, and bonding (Ch 1 – 3)
- Symmetry, group theory, and molecular orbitals (Ch 4 – 5)
- Acid/base chemistry (Ch 6)
- Coordination chemistry (Ch 9 – 10)
- Organometallic chemistry & catalysis (Ch 13) and some bioinorganic topics
- Solid-state chemistry, band structure & superconductivity (Ch 7)

If a major change to this syllabus becomes necessary, the updated syllabus will be posted to Blackboard, and an announcement will be made in class and online.

last updated: Jan 14, 2015

Please contact me if you have any questions. Best of luck in the upcoming semester! - GIM