**Inorganic Chemistry – Chem 260**

**Lecture Syllabus**

Spring 2019

University of Wisconsin-Whitewater

**Instructor Information**

Name: Dr. Steven Girard

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Office: Upham Hall 263

Phone: x 1096

Office Hours: 10:30 am – 1 pm MW, 11 am- 12 pm F, or by appointment

Lecture Meeting Time: Three times a week, MWF 1:00 - 1:50 pm in Upham Hall 236

Laboratory Meeting Time: Once per week in Upham Hall 240

**Course Prerequisites**

You must have placed out of or passed Chem 104 with a C or better.

**Course Materials**

You should obtain these course materials:

1) *Inorganic Chemistry,* 3rd edition, by Catherine E. Housecroft and Alan G. Sharpe (available at the university bookstore for rental)

2) Sapling Learning account ($40), sign up at [www.saplinglearning.com](http://www.saplinglearning.com)

3) The Spring 2019 *Laboratory Manual for Introduction to Inorganic Chemistry,* Chemistry 260

4) **Splash proof**, impact resistant safety goggles (available at the bookstore)

5) Scientific, non-graphing calculator capable of performing square roots, logarithms, exponentiation, and scientific notation operations. ***Cell phones and programmable calculators are not permitted.***

6) Computer access and a valid Canvas log on

7) Research notebook (available at the bookstore)

8) Sponge or cloth for use in lab

**Course Objectives and Organization**

This course is composed of two components:

**A. Lecture**:

Chemists generally define inorganic chemistry as a main pillar of the undergraduate chemistry curriculum, but what is inorganic chemistry? In this class, students will improve their understanding of atomic structure, periodic trends in the behavior of atoms, coordination chemistry, molecular orbital interactions, solid state chemistry, symmetry, nanochemistry, materials chemistry, and descriptive main group chemistry. Other topics include: atomic and molecular structures, bonding theories, redox chemistry, and acid-base theories. Students will additionally gain exposure to chemical literature and reading and writing scientific publications and presenting and disseminating scientific research.

**B. Laboratory**:

In the laboratory, students will experiment with various inorganic syntheses and analysis. Many of these experiments will be viewed and taught through the prism of experience of Dr. Girard as a materials nanochemist. Students will gain experience in preparing and analyzing various inorganic compounds, and understanding their applications.

Students will be expected to demonstrate proper preparative, manipulative, observation, and related computation skills as well as to develop an understanding of the fundamental principles and techniques upon which laboratory experimentation is based. Much emphasis will be placed on the proper keeping of a professional-quality research laboratory notebook, as well as high-quality scientific writing. ***Note that an overall lab grade less than 60% results in failure in lab and the entire course.***

Course policies

**A. Attendance**

* Attendance is highly recommended. **There will be important materials presented in**

**lecture that is NOT available from the lecture outline or the text**. If a lecture is missed, it is the student’s responsibility to find out and obtain materials pertaining to what was covered in lecture, including announcements, lecture notes, assignments, etc.

* Please respect your fellow students and the instructor by turning off all communication

devices, and refrain from noisy chatter and other disruptive behavior during class time.

Disruptive students will be asked to leave the classroom.

**B. Announcements**

Occasionally, the instructor may provide additional instructions for an upcoming lecture

shortly prior to class time. These announcements will be posted on the course Canvas web site news page and whenever possible, the instructor will also attempt to contact all students in the course via e-mail. It is advised that students regularly check their university issued email accounts (e-mail will only be sent to uww.edu accounts) and/ or the course web site for updates.

**C. Exams and Homework**

The exam schedule is included in this syllabus. Students must take their exams on the scheduled day. **Students MUST take the COMPREHENSIVE FINAL EXAM in order to pass the course.** In general, THERE WILL BE NO MAKE-UP EXAMS.

A missed exam or homework will be recorded as ZERO except for the following reasons:

**(1) Religious Beliefs Accommodation**

Board of Regents policy states that students’ sincerely held religious beliefs shall be reasonably accommodated with respect to scheduling all examinations and other academic requirements. Students must notify the instructor, within the first three weeks of classes of the specific days or dates on which they will request accommodation from an examination or academic requirement. For additional information, please refer to the University Bulletin and the Timetable; “Accommodation of Religious Beliefs”.

**(2) Absence for University Sponsored Events**

University policy adopted by Faculty Senate and the Whitewater Student Government states that students will not be academically penalized for missing classes in order to participate in university-sanctioned events. They will be provided an opportunity to make up any work that is missed; and if class attendance is a requirement, missing a class in order to participate in a university-sponsored event will not be counted as an absence. A university-sanctioned event is defined to be any intercollegiate athletic contest or other such event as determined by the Provost. Activity sponsors are responsible for obtaining the Provost’s prior approval of an event as being university sanctioned and for providing an official list of participants. Students are responsible for notifying their instructors as soon as possible (at least one week in advance) of their participation in such events.

**(3) You are very sick on the day of exam**

Students must contact the instructor **PRIOR** to class time on/ before the day of the exam AND must present a doctor’s note to the instructor explaining the absence at the beginning of the next class period (or the first session that the student starts attending class again). The doctor's note does not need to include medical details but must specify: (1) The date the student received care in the medical facility (2) The duration in which the student is deemed unfit to attend class. If you are unable to attend class for an extended period of time, please notify the instructor to discuss possible options for making-up missed exam(s).

If the student meets one of the three criteria given above, at the discretion of the instructor, the student may be asked to take the exam or homework or the remaining exams or homework may be averaged to provide a score for the missed exam or quiz. A student who misses the final exam with a legitimate reason will be asked to take the final exam on a different day (A different version of the exam may be given at the discretion of the instructor). Otherwise, the student will receive a ZERO for the missed exam or homework. You must **PROPERLY NOTIFY** the instructor of your intent and reason to miss an exam or homework following the procedures outlined above; otherwise your request may not be honored even if your reason is legitimate.

**Grading**

Students will be evaluated based upon their scores on homework, exams, a comprehensive final exam and laboratory reports. The exams will be conducted on the dates shown on the syllabus. The exams and homework will test the student’s understanding of and ability to apply the principles of chemistry presented in class. The final exam will be two hours in length. The scores for each of the above will be weighted as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **Assignment** | **Point Value** | **Percentage (approx.)** | **Due Date (estimated)** |
| Homework #1 | 20 | 2.44% | 2/1/19 @ 11:55 pm |
| Literature Discussion 1 | 30 | 3.66% | 2/8/19 @ 11:55 pm |
| Homework #2 | 20 | 2.44% | 2/15/19 @ 11:55 pm |
| **Exam # 1** | **65** | **7.93%** | **2/22/19 in class** |
| Homework #3 | 20 | 2.44% | 3/10/19 @ 11:55 pm |
| Literature Discussion 2 | 30 | 3.66% | 3/18/19 @ 11:55 pm |
| **Exam # 2** | **65** | **7.93%** | **3/22/19 in class** |
| Literature Discussion 3 | 30 | 3.66% | 4/5/19 @ 11:55 pm |
| Homework #4 | 20 | 2.44% | 4/7/19 @ 11:55 pm |
| Homework #5 | 20 | 2.44% | 4/21/19 @ 11:55 pm |
| Literature Discussion 4 | 30 | 3.66% | 4/22/19 @ 11:55 pm |
| **Exam # 3** | **65** | **7.93%** | **4/26/19 in class** |
| Homework #6 | 20 | 2.44% | 5/5/19 @ 11:55 pm |
| Literature Discussion 5 | 30 | 3.66% | 5/16/19 @ 11:55 pm |
| **Final Exam** | **150** | **18.29%** | **5/15/2019**  **12:15 – 2:15 pm** |
| Lab grade | 200 | 24.39% | See below |

**Table 1.** Spring 2019 Chemistry 260 assignments with their corresponding point values and estimated due dates.

Grades are awarded on the following scale:

Letter Grade % Equivalent GPA

A >92.0 % of total points 4.000

A- >89.0 % of total points 3.670

B+ >87.0 % of total points 3.330

B >83.0 % of total points 3.000

B- >80.0 % of total points 2.670

C+ >77.0 % of total points 2.330

C >72.0 % of total points 2.000

C- >70.0 % of total points 1.670

D+ >67.0 % of total points 1.330

D >63.0 % of total points 1.000

D- >60.0 % of total points 0.670

F <60.0 % of total points 0.000

**Figure 1.** Point allocations for Chemistry 260.

The instructor reserves the right to modify or change the grading scale as the course proceeds.

*Your final grade for the whole semester will be based on your proficiency in both lecture (75%) and laboratory (25%).*

***Students must pass the laboratory portion in order to pass the course****.*

**Homework**

The homework will be assigned using Sapling Learning (online). There will be six homework assignments worth 20 points each. Homework will be announced in class, along with any changes in due dates. Each student must obtain a Sapling Learning access for this course.

**Make-up Exams**

As mentioned above, students will only be allowed make-up exams if they contact the instructor **PRIOR** to the exam via email or the Chemistry Office (Upham Hall 220, 472-1070). A Written explanation of the absence is required.

**Contesting an Exam Grade**

If a student does not agree with the points received for a particular exam, a written appeal that clearly indicates the reason(s) for disagreement must be submitted by 5 PM via email the day following the return of the graded exam. The entire exam will be re-graded and returned to the student within a week. No verbal explanations will be provided.

**Laboratory Grading and Organization**

The laboratory material is designed to work in concert with lecture to provide students hands-on chemical experience. There are four multi-part experiments that will be completed in this course, for a total of 200 points in the class. For each lab, students will be graded on the quality of their laboratory notebooks (5-10 points), as well as a formal laboratory report. Detailed rubrics will be provided. The final experiment will be a formal lab report and presentation for each group of students. The grading for each lab will be as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **Laboratory** | **Points** | **Notes** | **Estimated Report Due Date** |
| Chemistry of Art | 40 | Synthesis of Inorganic Pigments  Exploring Photographic Chemistry | 3/4/19 |
| Metal Acetylacetonate Complexes | 40 | Part 1 Synthesis  Part 2 Recrystallization | 4/1/19 |
| Diffraction | 40 | Part 1 Experimental Simulation  Part 2 Introduction to PXRD | 4/15/19 |
| Exploratory Nano Project | 80 | ZnO and ZHS  Group Presentation | 5/10/19 |

**Table 2.** Spring 2019 Chemistry 260 laboratory assignments with their corresponding point values and estimated due dates.

**Dropping the course**

It is the students’ responsibility to obtain, fill out and get the necessary signatures on official drop forms *before the deadline*. Students must also check out of the lab or a “hold” will be placed on your record.

**Academic misconduct**

Academic misconduct (cheating, copying, and plagiarism) will not be tolerated and will be dealt with according to UWS Chapter 14. The university believes that academic honesty and integrity are fundamental to the mission of higher education and of the University of Wisconsin System. The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others’ academic endeavors. Students who violate these standards are subject to disciplinary action. UWS Chapter 14 identifies procedures to be followed when a student is accused of academic misconduct. For additional information, please refer to the section in the Student Handbook titled, Student Academic Disciplinary Procedures. **IF YOU CHEAT, YOU WILL FAIL!** There are no exceptions or mitigating circumstance.

**Special Accommodation**

If there is anyone in the class who requires special accommodations, please notify me. Please let your instructor know three days in advance if you desire to take an exam at a testing center or other location.

**Additional notes**

The University of Wisconsin-Whitewater is dedicated to a safe, supportive and nondiscriminatory learning environment. It is the responsibility of all undergraduates and graduate students to familiarize themselves with University policies regarding Special Accommodations, Misconduct, Religious Beliefs Accommodation, Discrimination and Absence for University Sponsored Events. (For details please refer to the Undergraduate and Graduate Timetables; the "Rights and Responsibilities" section of the Undergraduate Bulletin; the Academic Requirements and Policies and the Facilities and Services sections of the Graduate Bulletin; and the "Student Academic Disciplinary Procedures" [UWS Chapter 14]; and the "Student Nonacademic Disciplinary Procedures" [UWS Chapter 17]). These required syllabus contents were agreed upon by the actions of the Whitewater Student Government (S95- 96:09), Academic Staff Assembly, Faculty Senate (FS956-13 and FS989-11), Provost Prior, and Chancellor Greenhill (approved Nov. 17, 1998).

This classroom is dedicated to a safe, supportive and non-discriminatory learning environment and the open exchange of ideas that may include controversial or underrepresented viewpoints. It is the responsibility of all students to critically evaluate, and to respectfully engage in discussion of divergent viewpoints within the classroom context. In order to encourage a classroom environment where the free exchange of ideas is possible video and audio recording must be limited to that done for educational purposes, and prior instructor permission and notification of fellow students is required.

UW-Whitewater is a campus community that prides itself on treating its students with compassion, care and support both in their academic pursuits and in working through their prior life challenges or difficulties that they may have experienced. Per UW-W policies and practices, if and when certain information is learned, whether in an academic program, residence life or other campus activity, the person (UWW employee) who learns that information is required to report if the information includes any form of sex discrimination, violence, abuse or neglect, past or present. Because this educational program involves a great deal of discussion and education related to our personal histories, experiences and backgrounds, there will be times when you may share something personal that falls within one of the categories above, thereby requiring the instructor or staff person to report what was shared. If this occurs, the staff person will use discretion, reason and sensitivity to abide by our policies while respecting your privacy. The goal of these requirements is to prevent or avoid further harm to you, as a student, or those who may be exposed to further abuse by others. If you have questions or concerns, you are encouraged to talk with your course instructor or department chair.

**Schedule**

This schedule is extremely, hugely, bigly, very tentative, extremely amorphous, and will be subject to- and most likely will- change as the semester progresses.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Week** | **Lecture Dates** | **Lecture Topics** | **Chpt** | **Notes** | **Lab** |
| 1 | 1/23  1/25 | Course Introduction  Electron behavior in atoms | 1 |  | N/A |
| 2 | 1/28  1/30  2/1 | Electron behavior in atoms  Electron behavior in atoms  Lewis dot structures, Valence Bond theory, VSEPR theory | 1  1  2 | HW1 | Check in/ Safety |
| 3 | 2/4  2/6  2/8 | Intro to MO Theory  Intro to MO Theory  Intro to MO Theory | 2  2  2 | Lit Rev 1 | Chem of art: Inorganic Pigments |
| 4 | 2/11  2/13  2/15 | MO Theory, Acid/Base Theory  MO Theory, Acid/Base Theory  d-block Metal Chemistry | 2/7  2/7  19 | HW2 | Chem of art: Photographic chemistry |
| 5 | 2/18  2/20  2/22 | d-block Metal Chemistry  d-block Metal Chemistry  **Exam 1** | 19  19  20 | **Exam 1** | Macac compound synthesis |
| 6 | 2/25  2/27  3/1 | Coordination Compounds  Coordination Compounds  Coordination Compounds | 20  20  20 |  | Macac analysis and recrystalliza-tion |
| 7 | 3/4  3/6  3/8 | Coordination Compounds  Coordination Compounds  Coordination Compounds | 20  20 | Lab Rep 1  HW3 | Diffraction Part 1 |
| 8 | 3/11  3/13  3/15 | Symmetry operations (group theory)  Symmetry operations (group theory)  Symmetry operations (group theory) | 3  3  3 | Lit Rev 2 | Diffraction Part 2 |
| 9 | 3/18  3/20  3/22 | Symmetry operations (group theory)  Symmetry operations (group theory)  **Exam 2** | 3  3  3 | **Exam 2** | ZnO Nanoparticles Part 1 |
| ☺ | 3/25  3/27  3/29 | SPRING BREAK |  |  |  |
| 10 | 4/1  4/3  4/5 | Symmetry operations (group theory)  Symmetry operations (group theory)  Symmetry operations (group theory) | 3  3  3 | Lab Rep 2  Lit Rev 3 | ZnO Nanoparticles Part 2 |
| 11 | 4/8  4/10  4/12 | Solid state chemistry  Solid state chemistry  Solid state chemistry | 6  6  6 | HW4 | Exploratory Synthesis |
| 12 | 4/15  4/17  4/19 | Solid state chemistry  Solid state chemistry  Solid state chemistry | 7  7  7 | Lab Rep 3 | Exploratory Synthesis |
| 13 | 4/22  4/24  4/26 | Solid state chemistry  Review  **Exam 3** | 7  7 | HW5  Lit Rev 4  **Exam 3** | Exploratory Synthesis |
| 14 | 4/29  5/1  5/3 | Materials Chemistry  Materials Chemistry  Materials Chemistry | 24/25  24/25  24/25 |  | Lab Check Out |
| 15 | 5/6  5/8  5/10 | Materials Chemistry  Materials Chemistry  Materials Chemistry/Review | 24/25  24/25  24/25 | HW6  Lab Rep 4  Lit Rev 5 | Group Presentations |
| 16 | 5/15 | **Final Exam**  **On 5/15/19, 12:15 – 2:15 pm** |  | **Final Exam** | N/A |

**Table 2.** Tentative schedule for Spring 2019 Chemistry 260.

*NOTE \*\*\*\*\*No class materials, including lecture outlines and exam questions/answers, can be posted on non-UWW web site(s) without the written permission of the instructor and the publishers.\*\*\*\*\**

**Sapling Learning Homework Login Instructions**1. Go to [http://saplinglearning.com](https://post.uww.edu/owa/redir.aspx?C=qbCaX1gJfUKhUFsvmw8DBtCjZRRj4NAIH-_wmXwKzXyRp-WoPkqVMBlKmALd5UK--O_4mgzh6eU.&URL=http%3a%2f%2fsaplinglearning.com) and click on “US Higher Ed” at the right.

2a. If you already have a Sapling Learning account, log in and skip to step 3.

2b. If you have a Facebook account, you can use it to create a Sapling Learning account. Click “Create an Account”, then “Create my account through Facebook”. You will be prompted to log into Facebook if you aren't already. Choose a username and password, then click “Link Account”. You can then skip to step 3.

2c. Otherwise, click "Create an Account". Supply the requested information and click "Create My Account". Check your email (and spam filter) for a message from Sapling Learning and click on the link provided in that email.

3. Find your course in the list (you may need to expand the subject and term categories) and click the link.

4. Using your access card, follow the remaining instructions to access the course.    
  
Once you have registered and enrolled, you can log in at any time to complete or review your homework assignments.

**If ever you have any technical problems**, you should immediately send an email to support@saplinglearning.com **and** CC me on the email (girards@uww.edu).