CHEM 4701  
INORGANIC CHEMISTRY  
SPRING 2018

_Time and location:_ MWF 12:20 PM – 1:10 PM – 331 SMITH HALL

_Instructor:_ Prof. Valerie C. Pierre  
237 Smith Hall  
pierre@umn.edu

_Instructor office hours:_  
Mondays: 4:00 – 5:00 pm and Fridays 3:00 – 4:00 pm in Smith 237; other times by appointment only and only if you cannot come to these office hours.

_Teaching assistant:_  
Randy Wilharm  
wilha013@umn.edu

_Teaching assistant office hours:_  
Tuesdays: 4:30 pm – 5:30 pm, and Thursdays 1:00 pm – 2:00 pm in the third floor public lounge in Kolthoff hall. The TA will _not_ hold special office hours for students.

_Prerequisites:_ Chem 2311 or concurrent registration is required (or allowed) in 2311, Chem 4501 or 4502 or concurrent registration is required (or allowed) in 4501 or 4502.

_Text:_ Required:  

_Supplementary text:_ Similar topics are discussed in the textbooks by Shriver and Atkins and by Housecroft and Sharpe. You may want to consult with these books if you want a somewhat different perspective or writing style.

_Moodle course site:_ Students registered in this course must use the Chem 4701 Moodle site.

_Attendance:_ Attendance is important! YOU ARE RESPONSIBLE for all announcements and for all material covered in class, whether or not the topic is in the text. Also, it is YOUR RESPONSIBILITY to obtain missed lecture notes, copies of handouts, and announcements regarding changes in this syllabus.

_Ungraded problem sets:_ A combination of questions from Miessler, Fischer and Tarr and other books will be assigned as problem sets. Although problem sets will not be collected or graded, you should complete the homework as it is necessary to improve your understanding of the course material. Also, related problems (or possibly identical ones!) may well appear on exams. Answers to the problem sets will be made available on the class web site. You are encouraged to discuss them with your peers, your instructor, and/or your teaching assistant.
Exams:

Quizzes: Quizzes, each 15 minutes long, will be scheduled at the beginning of class time. There will be no make-up time for late-comers. It is your responsibility to be on time for each quiz. Each quiz will cover topics covered in the preceding 6 lectures and the associated reading assignments and problem sets. Quizzes are closed book, closed notes, and no calculators are allowed.

Midterms: Midterm exams will be scheduled during class time. Each midterm exam will emphasize topics covered in the preceding months; however, earlier material usually serves as a foundation for understanding the more recent topics and thus may also be included. Exams will primarily cover the topics covered in lectures, reading assignments and associated problem sets. No extra time will be granted to late-comers, so BE ON TIME! Midterms are closed book, closed notes, and no calculators are allowed.

Two midterm exams and five quizzes are scheduled for the semester in addition to the two-hour final. All quizzes and midterms are scheduled during class time. Quizzes will take place in 331 Smith Hall and midterms will take place in room to be determined. The dates are as follows:

<table>
<thead>
<tr>
<th>Quiz # 1</th>
<th>January 31, 2018</th>
<th>331 Smith Hall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz # 2</td>
<td>February 14, 2018</td>
<td>331 Smith Hall</td>
</tr>
<tr>
<td>Midterm # 1</td>
<td>February 28, 2018</td>
<td>room to be determined</td>
</tr>
<tr>
<td>Quiz # 3</td>
<td>March 21, 2018</td>
<td>331 Smith Hall</td>
</tr>
<tr>
<td>Quiz # 4</td>
<td>April 04, 2018</td>
<td>331 Smith Hall</td>
</tr>
<tr>
<td>Midterm # 2</td>
<td>April 18, 2018</td>
<td>room to be determined</td>
</tr>
<tr>
<td>Quiz # 5</td>
<td>May 02, 2018</td>
<td>331 Smith Hall</td>
</tr>
<tr>
<td>Final Exam</td>
<td>May 10, 2018 8:00 a.m. – 10:00 pm – room TBA</td>
<td></td>
</tr>
</tbody>
</table>

No early or late final exams will be given. No extra time will be granted to late-comers to the final exam, so BE ON TIME! The final exam is closed book and closed notes; no calculators are allowed.

No make-up exams or quizzes will be given. There is no alternate time for quizzes and exams. Your lowest quiz score will be dropped.

Missed exams: If an exam is missed for a reason allowed under university policy (https://policy.umn.edu/education/makeupwork) and properly documented then the missed exam score will be replaced by the unweighted average of the other midterm exam and the final exam. Only one missed midterm exam will be replaced in this fashion. If a quiz is missed for a reason allowed under university policy and properly documented then the missed quiz score will be replaced by the unweighted average of the other quizzes. Only one missed quiz will be replaced in this fashion. No make-up exam will be given. No quiz or exam will be given at an alternate time. An unexcused absence from any of the quizzes or midterm exams will result in a score of zero for that exam. If both midterm exams are missed, or if two or more quizzes are missed, the student must discuss the situation with Prof. Pierre at least two weeks prior to the final exam. For information on missing the final exam, see “Incompletes”.

Re-grade policy: If you believe your quiz or exam has been graded incorrectly, follow this procedure. Submit to Prof. Pierre (not the TA) your original graded quiz or exam and a written explanation containing specific rationale for why your answer is correct or why you believe your
work has been graded incorrectly. ("I think I deserve a better grade" is not a valid rationale.) Re-grades requests are intended to correct grading errors, not for negotiating a higher grade. When work is submitted for re-grade, the entire work will be re-graded. Re-grades will only be accepted within one week of a quiz or exam being returned in class; re-grades will not be accepted afterward. Re-grades will only be considered if the quiz or exam has been written in ink; no re-grade will be considered if your exam or quiz has been written in pencil.

**Grading:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>100</td>
<td>(4 × 25 points – lowest grade is dropped)</td>
</tr>
<tr>
<td>Midterms</td>
<td>200</td>
<td>(2 × 100 points)</td>
</tr>
<tr>
<td>Final</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>500</td>
<td></td>
</tr>
</tbody>
</table>

The A-F and S-N grading systems will be observed in this course. If you are taking the course on an S-N basis, you will receive an S only if your grade on the A-F scale would have been a C grade or better; i.e., D grades do not represent satisfactory performance in this course.

Letter grades for the course will be determined by a method that combines an absolute scale with a curve applied at the end of the semester to the benefit of the students if needed. That is, if you get the following course % average, and you take the final exam, the equivalent letter grade will definitely be no lower what is listed below. Grades may be curved in a favorable direction at the end of the semester.

**Minimum Average Required for Letter Grades**

<table>
<thead>
<tr>
<th>Course % average</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90</td>
<td>A</td>
</tr>
<tr>
<td>85</td>
<td>A-</td>
</tr>
<tr>
<td>80</td>
<td>B+</td>
</tr>
<tr>
<td>75</td>
<td>B</td>
</tr>
<tr>
<td>70</td>
<td>B-</td>
</tr>
<tr>
<td>65</td>
<td>C+</td>
</tr>
<tr>
<td>60</td>
<td>C</td>
</tr>
<tr>
<td>50</td>
<td>C-</td>
</tr>
</tbody>
</table>

**Incompletes:** A student who is otherwise doing satisfactory work (course average >50%) but who must miss the final exam for a valid reason can obtain a course grade of I (incomplete). Arrangements must be made before the final, and provisions for making it up will be arranged on a case-by-case basis. A signed contract is required. This option is rarely exercised. An unexcused absence from the final exam will result in a final grade of “F” (fail) for the class.

**Students with disabilities:** Students with disabilities affecting their ability to participate in class or to meet all course requirements are encouraged to bring this to the attention of the Disability Resource Center (DRC, 626-1333, drc@umn.edu, https://diversity.umn.edu/disability/) and to Prof. Pierre. Students who have an accommodation letter from DRC must schedule to take their exams at the DRC under their supervision at the Alumni Center. It is the student’s responsibility to contact DRC at least two weeks in advance to schedule their exam with them. Exams must
be scheduled to overlap with the normal exam times. The student is responsible for providing 
the instructor with a copy of the accommodation letter from DRC at least two weeks prior to the 
first exam.

Credits and Workload Expectations
One credit is defined as equivalent to an average (over a full semester) of three hours of 
learning effort per week necessary for an average student to achieve an average grade in the 
course. For example, a student with an average level of preparation who is taking a 3 cr., 3 
lecture-per-week course, such as CHEM 4701, should expect to spend an additional 6 hr/week 
outside of class on homework, reading assignments, and study to achieve a grade in the B-
range.

Scholastic Dishonesty
The U of M Student Conduct Code defines scholastic dishonesty as:

...plagiarizing; cheating on assignments or examinations; engaging in unauthorized 
collaboration on academic work; taking, acquiring, or using test materials without faculty 
permission; submitting false or incomplete records of academic achievement; acting 
alone or in cooperation with another to falsify records or to obtain dishonestly grades, 
honors, awards, or professional endorsement; altering, forging, or misusing a University 
academic record; or fabricating or falsifying data, research procedures, or data analysis.


A student responsible for scholastic dishonesty can be assigned a penalty up to and including 
an "F" or "N" for the course. If you have any questions regarding the expectations for a specific 
assignment or exam, ask. As noted above, the policy in our General Chemistry courses is that 
the presence or use of a programmable or graphing calculator, a smartphone or any 
other unauthorized electronic devices during an exam will be considered scholastic 
dishonesty. If a student is guilty of scholastic dishonesty, the instructor will assign a grade of 
zero on the work involved and will report the matter to the student's college Scholastic Conduct 
Committee.

If you have additional questions, please clarify with your instructor for the course. Your instructor 
can respond to your specific questions regarding what would constitute scholastic dishonest in 
the context of a particular class; e.g., whether collaboration on assignments is permitted, 
requirements and methods for citing sources, if electronic aids are permitted or prohibited during 
an exam. The Office for Student Conduct and Academic Integrity has compiled a useful list of 
Frequently Asked Questions pertaining to scholastic dishonesty: 
http://www1.umn.edu/oscai/integrity/student/index.html

Student mental health and stress management: As a student you may experience a range of 
issues that can cause barriers to learning, such as strained relationships, increased anxiety, 
alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These 
mental health concerns or stressful events may lead to diminished academic performance or 
reduce a student's ability to participate in daily activities. University of Minnesota services are 
available to assist you with addressing these and other concerns you may be experiencing. You 
can learn more about the broad range of confidential mental health services available on 
campus via http://www.mentalhealth.umn.edu/.

Teaching and learning, student responsibilities, intellectual property: The materials 
provided in this course are intended only for the students officially enrolled in this section and 
are to be used to learn and practice the course material. Students may not distribute
instructor-provided notes or other course materials, except to other members of the same class and with the express (written) consent of the instructor. Students may not engage in the widespread distribution or sale of transcript-like notes or notes that are close to verbatim records of a lecture or presentation.

http://www.policy.umn.edu/Policies/Education/Education/STUDENTRESP.html

**Use of personal electronic devices in the classroom.** Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. Students are directed to turn off personal electronic devices including cell phones if the devices are not being used for class purposes such as note taking. **Students are not permitted to record any part of a class/lab/other session unless explicitly granted permission in writing by the instructor.** If the student does not comply, the student may be asked to leave the classroom.

**UMN Policies** described in the following links are enforced in this class.

https://policy.umn.edu/education/syllabusrequirements-appa

https://policy.umn.edu/education/studentresp

1. Grading and transcripts:
   
   http://www.policy.umn.edu/Policies/Education/Education/GRADINGTRANSCRIPTS.html

2. Makeup work for legitimate absences:
   
   http://www.policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html

3. Academic freedom and responsibility:
   

4. Sexual harassment:
   
   http://regents.umn.edu/sites/default/files/policies/SexHarassment.pdf

5. Equity, diversity, equal opportunity, and affirmative action:
   
   http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.pdf
Course Outline:

Topic 1. Atomic orbitals and properties
Topic 2. Properties of atoms and ions
Topic 3. Molecular Symmetry
Topic 4. Valence bond theory
Topic 5. Molecular orbital theory
Topic 6. Coordination complexes of d-block metals: ligand field theory
Topic 7. Thermodynamics Aspects of Coordination complexes
Topic 8. Transition metal reactivity – ligand exchange
Topic 9. Transition metal reactivity – electron transfer
Topic 10. Organometallic chemistry
Topic 11. Supramolecular chemistry
Topic 12. Transition metal reactivity – stereochemical non-rigidity
(If time allows)

Reading assignments, class slides, and associated homework/problem sets with their associated answer keys for each of the above topics are posted on the class Moodle site.