CHEM 202

FALL 2019

CLASS SCHEDULE:
Section 1: TTh 10-11:15 am
Section 2: TTh 1-2:15 pm
Section 3: TTh 2:30- 3:45 pm

INSTRUCTOR: Dr. Nichole Powell
OFFICE: OSB 420
OFFICE HOURS: Designated hours:
Tues and Thurs: 4:00 - 5:00 pm
Wed: 5:30 - 6:00 pm.

CONTACT INFORMATION: Email: nichole.powell@emory.edu Telephone: 770-784-8396

CLASS MATERIALS (REQUIRED):
3. McGraw-Hill CONNECT access (you will get this access with the Chemistry: Atoms First e-book)
4. ALEKS Registration Code for Powell sections
5. Scientific calculator (must be brought to every class). Calculators that can download and/or store information, can automatically solve equations or perform conversions, or can be programmed, are not allowed on quizzes/exams. The two calculators which are allowed are TI-30Xa or 30X II. These are generally available from places like Amazon or WalMart for under $15. Any other calculators will have to be checked and approved by the instructor. Students will not be allowed to borrow calculators from their classmates during class assignments, quizzes, or exams. The use of cell phones and PDAs will not be allowed.
6. “Molecular Visions” Model Kit – you will use this for multiple semesters

CLASS MATERIALS (RECOMMENDED):
- The solutions manuals for the textbooks. These are available in the Library Reserves.

THE CHEMISTRY UNBOUND CURRICULUM:
The curriculum is a student-centered, unifying approach to teaching chemistry that will break down barriers between traditional chemistry disciplines to build lasting thematic frameworks and give students context to real-world problems and solutions.

PEDAGOGICAL APPROACH OF THE CURRICULUM:

“What is important is learning, not teaching. Teaching effectiveness depends not just on what the teacher does, but rather on what the student does.”

- lecture-based teaching is passive for students, and only leads to 10% retention of the lecture material.
- comprehension jumps to 50-90% when students listen, observe, discuss, and participate in or outside the classroom.
- over 100 reputable institutions, such as MIT, Princeton, Harvard, North Carolina State, and Clemson (and now Emory!) use non-lecture-based teaching methods in their undergraduate science courses.
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COURSE GOALS:
The goal of this course is to provide a basic understanding of kinetics and thermodynamics of chemical reactions and how these are related to the structure of the reactants and products and the pathways between them. You will use reaction coordinate diagrams and the curved arrow formalism to illustrate reaction mechanisms, and you will be introduced to substitution, elimination, and nucleophilic acyl substitution reactions and their mechanisms. When you finish the course you will be ready to learn more reactions and their mechanisms and the importance of molecular orbitals in chemical reactivity.

COURSE OBJECTIVES:
Upon successful completion of this course you will be able to:

- Use your understanding of chemical bonding and energetics to predict and explain changes in enthalpy, entropy, and free energy for a variety of processes and reactions.
- Use your understanding of collision theory, temperature, and average kinetic energy of the system to make predictions about reaction rate and explain in the context of a reaction coordinate diagram.
- Demonstrate your understanding of chemical equilibrium and acid base chemistry through two different approaches: quantitative (mathematical calculations) and qualitative (structural analysis).
- Apply your understanding of acids and bases, thermodynamics, and kinetics to predict and explain simple organic reactions: substitution, elimination, and nucleophilic acyl substitution.
- Illustrate your understanding of reaction mechanisms by using curved arrow formalisms and proposing reaction coordinate diagrams.
- Interpret experimental kinetic data to distinguish between unimolecular and bimolecular substitution mechanisms and explain the differences in mechanisms from a structural perspective.

COURSE COMPONENTS:

CLASS MEETINGS:
This course utilizes the flipped classroom pedagogical approach. This student-centered approach allows students to learn more deeply, become more active participants in their learning, increases student interaction and peer-to-peer learning, and allows students to get more feedback.

Adapted from: https://facultyinnovate.utexas.edu/flipped-classroom
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Class meetings will emphasize the concepts and skills necessary for you to understand and investigate chemical behavior. It is also important that you become conversant with the language chemists use. Research on learning shows that explaining concepts helps you to better understand and retain the material than just merely listening to an explanation. It is therefore important that you prepare for each class, actively participate in class and ask questions when you do not understand the concepts. To help you understand the course material each class session will involve you working in groups to actively learn and apply the course material, solve problems and explain your problem-solving strategy. In keeping with the pedagogical approach of the Chemistry Unbound curriculum, the course will not be lecture intensive, however most class sessions will involve a mini-lecture to help you solidify the concepts.

Attendance
You are expected to attend each class period. Attendance is taken at the beginning of class, and it is your responsibility to ensure that your attendance was correctly recorded before you leave at the end of the class period. You are allowed 3 absences during the semester. Each absence exceeding 3 absences will result in a corresponding point deduction from your final course grade (eg. 4 absences= 1 pt, 5 absences= 2 pts etc). There are no excused absences but the ability to miss 3 days of class allows you to take a mental health day (if needed).

You are responsible for all material covered in the class meeting even if you were absent.

Religious Holidays: Instructors are encouraged, not required, to accommodate students' academic needs related to religious holidays. Please make every effort to negotiate your religious holiday needs within the first two weeks of the semester; waiting longer may compromise your instructor’s ability to extend satisfactory arrangements. If you need guidance negotiating your needs related to a religious holiday, the College Chaplain, Rev. Lyn Pace, ppace@emory.edu, Candler Hall 202, is willing and available to help. **Please be aware that Rev. Pace is not tasked with excusing students from classes or writing excuses for students to take to their professors. Emory’s official list of religious holidays may be found at http://www.religiouslife.emory.edu/faith_traditions/holidays.html.

Graded Assignments
Graded assignments (includes ALEKS and graded homework) will be given throughout the semester. The assignments will usually be housed on Canvas. ALEKS assignments are due before the topic is explored in class. CONNECT-based chapter quizzes/homework will usually be due within 48 hrs after we have completed the chapter/topic in class. Your lowest CONNECT homework assignment grade will be dropped.

Non-graded Assignments
You are expected to complete all assignments regardless of whether or not they will be graded. You are expected to work, at minimum, the end of chapter problems in your textbook that are indicated on Canvas, unless otherwise noted.

Pre-class quizzes
A very short pre-class quiz will be administered in Canvas the day before most class meetings. The pre-class quiz will be used to gauge your understanding of the material to be explored/applied during the next class meeting. You will be told the specific pre-reading or video that is relevant to the pre-class quiz.

In-class Assignments
In-class assignments include worksheets and any quizzes given during the semester. Every four checked worksheets will be grouped and assigned a grade equivalent to one quiz grade or 20 pts. Your lowest grouped worksheet or quiz grade will be dropped. You cannot make up in-class assignments if you are absent.
Examinations
Three (3) exams are scheduled during the regular class period. No make-up examinations will be given. Excuses including the reason for missing an exam must be presented before the scheduled exam—this may be done by email or sending a note to class. Ensure that your excuse is verified and accepted by the Oxford Advising Support Center. If the excuse is accepted, the grade obtained on the final exam will count in place of the missed exam. If your excuse is not accepted you will receive a zero for that exam. You may only be excused from missing 1 exam.

Anticipated Exam Schedule:

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
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<tbody>
<tr>
<td>I</td>
<td>Tuesday, Oct. 8</td>
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<tr>
<td>2</td>
<td>Thursday, Nov. 7</td>
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<tr>
<td>3</td>
<td>Thursday, Dec. 5</td>
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Exam dates are subject to change. The sections to be covered in each exam will be announced in class.

Final Exam – will be given during the final exam period.
- **Section 1** on Tuesday, Dec. 17 at 7 - 10 pm.
- **Section 2** on Monday, Dec 16 at 9 am - 12 pm.
- **Section 3** on Wednesday, Dec. 18 at 7 - 10 pm.

The final examination is mandatory and will be comprehensive. Any material discussed during the semester may be included in this exam. Final exams will not be returned.

COURSE GRADE:
Your course grade will be computed as follows:

<table>
<thead>
<tr>
<th>ALEKS Objectives</th>
<th>4%</th>
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<tbody>
<tr>
<td>ALEKS Final Assessment</td>
<td>3%</td>
</tr>
<tr>
<td>Graded Homework</td>
<td>5%</td>
</tr>
<tr>
<td>(CONNECT)</td>
<td></td>
</tr>
<tr>
<td>In class Assignments/Worksheets</td>
<td>5%</td>
</tr>
<tr>
<td>Pre-class quizzes</td>
<td>2%</td>
</tr>
<tr>
<td>Exams (3)</td>
<td>60%</td>
</tr>
<tr>
<td>Final Exam (Cumulative)*</td>
<td>21%</td>
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<tr>
<td>LearnSmart</td>
<td>1%(Bonus)</td>
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</table>

Total 101%

* I have a growth mindset, inclusive grading policy. Since you will grow in your knowledge throughout the semester, I believe that growth should be reflected in your course grade. Your final exam grade may therefore be used to replace your lowest exam grade with the following exceptions: 1) If you have a zero on an exam due to missing the exam without a valid excuse no grade may be replaced, including the zero. 2) If you missed an exam with an accepted excuse only the grade for the excused exam may be replaced. This means that your final exam would count for 21% of your grade, if it is lower than your other exam grades; or 41% of your overall course grade if it is higher than one of your other exam grades.

**Grading Scale**
- A = 93 – 100
- A- = 90 – 92
- B+ = 87 – 89
- B = 83 – 86
- B- = 80 – 82
- C+ = 77 – 79
- C = 73 - 76
- C- = 70 - 72
- D+ = 67 - 69
- D = 60 – 66
- F = below 60 F
Errors in grading:
Exams should be reviewed immediately upon return for grading or addition errors. If there appears to be an error, submit your request for a regrade in writing no later than one week after the exam was returned in class. The Regrade Request form is available in Canvas.

HONOR CODE
It is expected that you will adhere to the Honor Code [link]. It is expected that you will not cheat, contribute to or condone the cheating of others. You are therefore expected to submit your own best effort on all assignments. Pens/pencils and a non-programmable calculator are the only tools you are allowed to bring to and use in exams (no cell phones or smartwatches). Having a cell phone/smart watch during a quiz/exam will be treated as a violation of the Honor Code. Unless otherwise specified, collaboration is not allowed in any assignment to be submitted.

FEEDBACK
Feedback is given in a variety of ways – dependent on the type of assignment. Below is the key for feedback given on quizzes/exams.
- CAL – calculation error
- CON – inadequate understanding of concept
- CVF – problems with conversion factor
- FORM – incorrect formula or wrong use of formula
- SFU – problems with significant figures and/or units

Q&A SESSIONS
A brief question and answer session will be conducted in the class session prior to each exam.

Canvas will be the primary means of communicating outside of class. It also houses all course content and course resources. Students are also expected to read the Canvas site daily. It is extremely helpful to receive Canvas notifications.

AVAILABLE RESOURCES
- Physical copies of the textbooks used in this course (as well as solutions manuals) are available as course reserves in the library.
- Need help? – please come to office hours at the first sign of trouble. You should also attend the weekly SI sessions even if you think you have mastered the material.
- Tutors – The tutoring schedule is available in Canvas. Tutors are available Sun – Wed.
- Need more problems? - the textbook "Chemistry: A Molecular Approach” by Tro (including solutions manual) and “General Chemistry” by Chang are available as course reserves in the library.

ACCOMMODATION
The Office of Accessibility Services (OAS) works with students who have disabilities to provide reasonable accommodations. In order to receive consideration for reasonable accommodations, please contact the OAS and complete the registration process. Faculty may not legally provide you with accommodations until an accommodation letter has been processed and discussed with them; accommodations do not start until this point and are not retroactive. Students registered with OAS who receive a letter outlining specific academic accommodations are thus strongly encouraged to immediately coordinate a meeting with their professors to discuss a protocol to implement accommodations that will (or may) be needed over the course of the semester. This meeting should occur as early in the term as possible. Contact Megan Bohinc in OAS for more information at (770) 784-4690 or oas_oxford@emory.edu.
**ADDITIONAL INFORMATION**

Quiz and Exam keys will be posted on Canvas. Exam keys are posted 24 hrs after the exam is returned in class. It is very important that you spend time reworking questions you had difficulty with before looking at the exam key. If you are still having difficulty after consulting the key – please see me for help.

**Welcome to CHEM 202!**

In order for you to become fluent and proficient in a foreign language (eg. Spanish or French) you have to spend time practicing (reading, writing, and speaking) the language. Chemistry is like a foreign language and in order to become proficient you must spend time reading (textbook), writing (solving many problems, and a variety of problems), and speaking (explaining concepts and using the correct terminology) Chemistry. All activities and assignments given in this course are to help you become proficient in Chemistry. I encourage you to have an open mind, actively participate in class and lab, and consistently spend time practicing Chemistry!

**Student work submitted as part of this course may be reviewed by Oxford College and Emory College faculty and staff for the purposes of improving instruction and enhancing Emory education.**

**EMORY STATEMENT ON CIVIL DISCOURSE:**

We believe the manner in which we interact with each other is critical to cultivating and maintaining a meaningful and effective intellectual environment. We encourage a climate of respect and inclusiveness that welcomes and embraces community members with diverse backgrounds and life experiences. We deliberately seek multiple perspectives and support the free and open exchange of ideas and civil discourse. We affirm the inherent dignity in all of us and we strive to maintain a climate of justice marked by respect for each other. Our community can only continue to thrive when we approach each conversation with an open mind and when each member can contribute fully.