Chemistry 1415, Fall 2016
Course Website: canvas.ou.edu

Instructor Contact Information & Class Times

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Office</th>
<th>Phone</th>
<th>Email</th>
<th>Section</th>
<th>Day</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Z. Yang</td>
<td>TBA</td>
<td>5-1772</td>
<td><a href="mailto:zhibo.yang@ou.edu">zhibo.yang@ou.edu</a></td>
<td>001</td>
<td>MWF</td>
<td>10:30 am – 11:20 am</td>
<td>Dale Hall 211</td>
</tr>
</tbody>
</table>

Instructor Office Hours

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Office Hour Location</th>
<th>Day</th>
<th>Time(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Z. Yang</td>
<td>CHBA 219</td>
<td>MWF</td>
<td>11:35 am – 12:35 pm</td>
</tr>
</tbody>
</table>

Description: Chemistry 1415 is the second semester of a two semester sequence of general chemistry for students in the physical sciences, engineering, health sciences, biological sciences, and related fields.

Prerequisite: Grade of C in Chemistry 1315 or satisfactory score on the chemistry placement examination. This class is a continuation of Chemistry 1315.

Text: Chemistry: Structure and Properties, 1st Ed., Tro, Pearson, 2015. Although the Tro text has been selected for the course, you may choose to use any general chemistry textbook or open source online (e.g. https://openstax.org/details/chemistry) provided you are comfortable using the learning objectives in the syllabus and your source’s table of contents.

Homework & Sapling Reading Assignments: Online website, Saplinglearning.com (http://www2.saplinglearning.com/)


Preparation for Lectures & Exams

In order to be successful in CHEM 1415, students should do the following daily:

- Check email for course announcements.
- Consult lecture and lab syllabi for readings and read the appropriate material to be covered in the next meeting.
- Refer to the calendar on the Canvas 1415 site for important deadlines, including due dates/times of Sapling homework and reading assignments.
- Work on Sapling homework and reading assignment problems each day to keep up with the lecture.
- Check lab report and recitation assignment due dates.
- Verify the accuracy of any grades posted to the gradebook of Canvas (both lecture and lab/recitation).

Important Dates & Due Times

See the Canvas course calendar for a complete listing:

- There are three mid-term exams on 9/15, 10/13, and 11/10. These are held from 7:30 pm – 8:45 pm.
- The final exam is on 12/12 from 7:30 – 9:30 pm.
- Sapling Reading Assignments (EC SRA-#) for lecture preparation are due at 11:55 p.m. every Monday and Sapling Homework problem sets (HW-#) are due at 11:55 p.m. each Friday night. The only exception is during mid-term exam weeks when the Sapling Homework is due on Wednesday at 11:55 p.m.
- Lab and Recitation due dates/times will be addressed by your lab/recitation instructor. Turn in assignments accordingly.

Canvas Calendar & Readings:

Students should consult the Canvas course calendar to prepare for each lecture, lab, and recitation. For lecture, determine the number of lecture days over which a unit is covered, and divide the learning objectives of the unit (see pages 2 – 4) by this number. This will give an approximation of the content covered in each lecture.

The instructor reserves the right to change any items contained in this syllabus. This includes, but is not limited to: course content, scheduled dates, and fraction(s) of final grade assigned to individual components of the course.
Exams:
Exam content will be announced in lecture. Exams may not fall at the end of a Unit, but may have part of the Unit learning objectives on one exam and the rest on the next. For example, Unit 2 may be split between Exams 1 and 2.

Exam dates are as follows:

**EXAM 1** - Thursday, September 15th, 7:30 – 8:45 p.m. (Rooms to be announced)
**EXAM 2** - Thursday, October 13th, 7:30 - 8:45 p.m. (Rooms to be announced)
**EXAM 3** - Thursday, November 10th, 7:30 - 8:45 p.m. (Rooms to be announced)
**CUMULATIVE FINAL EXAM** - Monday, December 12th, 7:30 - 9:30 p.m. (Rooms to be announced)

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**Learning Objectives and Reading Assignments**

Reading Assignments refer to Chapter and Sections of the text (Chemistry: Structure and Properties, 1st Ed., Tro, Pearson, 2015)

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**Unit 1: Thermochemistry and Thermodynamics - Chapter 10, 19**

1. Essential Chemistry Review KE, PE, chemical energy; Use thermochemical equation and stoichiometry; calculate heat of a reaction, \( \Delta H_{\text{rxn}} \), from standard heat of formation, \( \Delta H_f \). [Chapter 10]
2. Use calorimetry to determine changes in energy or enthalpy from experimental data. [Readings 10.5, 10.6, 10.7]
3. Use Hess’s Law to determine changes in enthalpy, \( \Delta H_f^\circ \). [Readings 10.8]
4. Write formation reactions. Explain the meaning or purpose of formation reactions. [Readings 10.8]
5. Characterize spontaneity and chemical driving force. [Readings 19.1, 19.2]
6. Use Boltzmann’s macro-state and microstate to explain entropy. [19.3]
7. Predict the Entropy Change in physical and chemical reaction. Predict the relative entropy between substances. [19.4] (some review)
8. Determine \( \Delta S^\circ \) for a chemical reaction from \( S^\circ \) values of reactants and products. [Readings 19.4]
9. Explain entropy of the universe, \( , \Delta S^\circ_{\text{univ}} \), and calculate changes in entropy of the universe based on entropy and enthalpy of a system. [Readings 19.5]
10. Determine \( \Delta G^\circ \) for a chemical reaction from the Gibbs Free Energy equation. [Readings 19.6, 19.7]
11. Determine the equilibrium temperature, \( T_e \), for a chemical reaction from \( \Delta H^\circ \) and \( \Delta S^\circ \). [Readings 19.8]
12. Determine \( \Delta G^\circ_{\text{rxn}} \) for a chemical reaction from \( \Delta G^\circ \) values of reactants and products. [Readings 19.7]
13. Explain the significance of the change in free energy. [Readings 19.7]

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**Unit 2: Chemical Equilibrium - Chapter 16, 19**

1. Characterize dynamic equilibrium of chemical reactions in terms of reversibility and relative concentrations of Reactants and Products. [Readings 16.2]
2. Determine equilibrium expressions for homogeneous and heterogeneous chemical reactions from balanced chemical equations. [Readings 16.2]
3. Determine the relationship between \( K_{\text{original}} \) and \( K_{\text{new}} \) (K and K') when a chemical reaction is reversed, or multiplied by a constant factor of \( n \), or two reactions are added to form a third reaction. [Readings 16.3, 16.5]
4. Determine the relationship between \( K_c \) and \( K_r \) for a chemical reaction involving gaseous components. [Readings 16.4]
5. Determine value for \( K \) from equilibrium concentrations of reactants and products in a chemical reaction. [Reading 16.6]
6. Use the reaction quotient (Q) and the equilibrium constant (K) to predict the direction the reaction will shift, if any. [Read 16.7]
7. Calculate the equilibrium concentration of reactants and products using an ICE table. [Readings 16.8]
8. Use Le Châtelier’s Principle to predict the direction a reaction at equilibrium will shift as a result of changes in concentration, pressure or volume, and temperature to reestablish equilibrium. [Readings 16.9]
9. Calculate the standard change in free energy, \( \Delta G^\circ \), for a chemical reaction from the equilibrium constant; calculate the equilibrium constant from the standard change in free energy. [Readings 19.8]
10. Calculate the change in free energy, \( \Delta G \), under non-standard conditions. [Readings 19.8]
Unit 3: Aqueous Equilibria: Partially Soluble Salts and Complex Ions in Equilibrium Reactions – Chapter 18
3.0. Review: Ionic compounds: formulae and nomenclature and physical properties.
3.1. Determine the K_sp equilibrium expression for partially soluble salts. [Readings 18.5]
3.2. Determine the K_sp value given the solubility of a salt, or given K_sp determine the molar solubility of partially soluble salts. [Readings 18.5]
3.3. Determine the effect of a common ion on the solubility of a partially soluble salt. [Readings 18.5]
3.4. Predict precipitation using the reaction quotient and equilibrium constant [Reading 18.6]
3.5 Identify complex ions [Reading 18.7]
3.6 Identify and calculate K_f for Complex Ions involving Insoluble Salts [Readings 18.7]

Unit 4: Acids and Bases in Water -- Chapter 9, 17
4.0. Review: Identify the structure of acids: Inorganic, oxyacids, and organic acids. Identify common bases; hydroxides and amines
4.1 Define acids and bases in terms of Arrhenius and Brønsted-Lowry theories. Recognize and construct conjugate acid-base pairs of Brønsted-Lowry acids or bases in water. [Readings 17.3]
4.2. Using polarity, bond strength, and acid structure predict the strong and weak acids. [Readings 17.4]
4.3. Relate equilibrium reactions for weak acids with K_s values. Relate equilibrium reactions for weak bases with K_b values. [Readings 17.5, 17.8]
4.4. Explain auto-ionization of water and use K_w to calculate [H^+] and [OH^-] ion concentrations. Use [H^+] or [OH^-] to find pH and pOH, and vice versa. [Readings 17.6]
4.5. Calculate the [H_2O^+] and pH (and [OH^-] and pOH) of strong and weak acids. [Readings 17.7]
4.6. Calculate the [OH^-] and pH (and [H_2O^+]) and pOH of strong and weak bases. [Readings 17.8]
4.7. Identify acidic, basic, and neutral salts and ions [Readings 17.9]
4.8. Calculate the pH and [H^+], [OH^-], and pOH of a salt solution. [Readings 17.9]
4.9. Construct an ordered list of strongest to weakest for acids or bases from K_a and K_b values. [Readings 17.9]
4.10. Determine the [H^+], [OH^-], pH and/or pOH of weak and strong polyprotic acids. [Readings 17.10]
4.11. Identify acids and bases using Lewis theory. [Readings 17.11]

Unit 5: Buffers, Acid/Base Neutralization, and Titrations - Chapter 9, 18
5.1. Identify acid-base reactions, Neutralization. [Readings 9.7]
5.2. Define buffers and identify combinations of acids and bases that form buffers. [Readings 18.2]
5.3. Calculate the pH of a buffer as an equilibrium problem and with the Henderson-Hasselbalch equation. [Readings 18.2]
5.4 Calculate the change in pH when acid or base is added to buffer [Readings 18.2]
5.5 Make an effective buffer with high capacity at a specific pH. [Readings 18.3]
5.6. Analyze a strong acid/strong base titration (including polyprotic) (identify equivalence point, pH at any point, and molar mass). [Readings 18.4]
5.7. Analyze a titration of a weak acid or base with a strong base or acid (identify pK_a, equivalence point, pH at any point, and molar mass). [Readings 18.4]

Unit 6: Electrochemistry - Chapters 18 (§8)
6.1 Define and identify oxidation process, reduction process, oxidizing agent, and reducing agent for a redox reaction. [Readings 9.9]
6.2. Assign oxidation numbers (oxidation states) to individual elements in a chemical compound or complex ion. [Readings 9.9]
6.3. Recognize redox reactions; distinguish from reactions not involving oxidation/reduction. [Readings 9.9]
6.4. Balance oxidation-reduction reactions. [Readings 20.2]
6.5. Draw a diagram of a voltaic (galvanic, spontaneous) cell and explain how it works, predicting changes which will occur during discharge. [Readings 20.3]
6.6. Define and identify anode and cathode relating them to oxidation and reduction process. [Readings 20.3, 20.4]
6.7. Construct a line notation for an electrochemical cell from a balanced reaction and write a balanced reaction from a line notation. [Readings 20.3]
6.9. Predict the products of a spontaneous redox reaction. [Readings 20.4, 20.8]
6.10. Calculate and relate standard free energy, cell potential, and equilibrium values (E°, ΔG°, and K) for spontaneous and non-spontaneous reactions. [Readings 20.5]
6.11. Calculate cell potential, E, for a redox reaction under non-standard conditions of constituent concentrations and/or pressures. [Readings 20.6]
6.12. Draw, explain, and identify process in electrolytic cells. [Readings 20.8]
6.13. Calculate the amount of product(s) produced, current used, time involved, or moles of electrons using associated in an electrochemical process. [Readings 20.8]
Unit 7: Kinetics - Chapter 15
7.1. Use rate expressions to relate reactant and product concentrations to the rate of the reaction for a given reaction at a given time. [Reading 15.3]
7.2. Derive the rate law, reaction order, and rate constant for a chemical reaction from experimental concentration and rate data. [Readings 15.4]
7.3. Using integrated rate laws, determine half-life and calculate rate constant, time, or concentration of first, second, and zero order reactions. [Readings 15.5]
7.4. Determine ΔH & E_a for a chemical reaction from a reaction progress profile. [Readings 15.6]
7.5. From kinetic data, determine the relationship between E_a, k, and the temperature of both catalyzed and uncatalyzed chemical reactions. [Readings 15.6]
7.6. Use collision theory to explain how chemical reactions occur and how rates are affected. [Readings 15.6]
7.7. Determine the relationship between the rate law and the mechanism of a simple chemical reaction. [Readings 15.7]
7.8. Explain the role of catalysts, what they are, how they work, and how they affect a reaction profile. [Readings 15.8]
7.9. Identify the relationships between the rate of the reaction, equilibrium, and free energy.

Unit 8: Nuclear Chemistry - Chapter 21 (S2)
8.1. Identify the number of protons and neutrons found in the nucleus of any atom. [Readings 1.8, 21.3]
8.2. Identify the symbols representing various subatomic particles. [Readings 21.3]
8.3 Write balanced equations for nuclear reactions including decay, transmutation, fission, & fusion. [Readings 21.3, 21.7, 21.9, 21.10]
8.5. Determine the half-life, beginning amount, final amount, or elapsed time in radioactive decay reactions, including carbon and uranium dating. [Readings 21.6]
8.6. Determine the mass defect, binding energy, and binding energy per nucleon for a nuclear particle. [Readings 21.8]
8.7. Determine the energy (kJ/mol) absorbed or released in a nuclear reaction. [Reading 21.8]

Evaluation (grading)
A total of 895 points are possible for CHEM 1415.
Letter grades will be assigned based on the point cut-offs listed in the table to the right.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Points</th>
<th>Final Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90%</td>
<td>805</td>
<td>A</td>
</tr>
<tr>
<td>80%</td>
<td>716</td>
<td>B</td>
</tr>
<tr>
<td>70%</td>
<td>626</td>
<td>C</td>
</tr>
<tr>
<td>60%</td>
<td>537</td>
<td>D</td>
</tr>
<tr>
<td>Below 60%</td>
<td>&lt;537</td>
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The 895 points possible in CHEM 1415 are distributed as shown (detailed description of each follows table):

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Point distribution</th>
<th>Total point contribution to final grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-term Exam</td>
<td>Three exams @ 100 pts each</td>
<td>300 pts</td>
</tr>
<tr>
<td>Final Exam</td>
<td>One comprehensive exam @ 200 pts</td>
<td>200 pts</td>
</tr>
<tr>
<td>Laboratory Reports</td>
<td>Ten lab reports @ 15 pts each</td>
<td>150 pts</td>
</tr>
<tr>
<td>Full Lab Report</td>
<td>One five-page lab report @ 75 pts</td>
<td>75 pts</td>
</tr>
<tr>
<td>Recitation</td>
<td>Twelve recitation scores recorded, best nine used toward final grade @ 10 pts each</td>
<td>90 pts</td>
</tr>
<tr>
<td>Homework (Sapling Learning)</td>
<td>Best 13 out of 15 Homework problem sets @ 5 points each</td>
<td>65 pts</td>
</tr>
<tr>
<td>Safety Video Quiz (Canvas)</td>
<td>Ten questions @ 0.5 pts each</td>
<td>5 pts</td>
</tr>
<tr>
<td>Syllabus Quiz (Canvas)</td>
<td>Ten questions @ 0.5 points each</td>
<td>5 pts</td>
</tr>
<tr>
<td>Integrity Quiz (Canvas)</td>
<td>Ten questions @ 0.5 points each</td>
<td>5 pts</td>
</tr>
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</table>

Total points possible = 895
COURSE STRUCTURE

CHEM 1415 is divided into the follow three components:

1. **Lecture.** The CHEM 1415 lecture consists of three class times (MWF) per week. Lecture is taught by Dr. Zhibo Yang and is a large meeting of 200+ students. The Learning Objectives (see pages 2–4 of the course syllabus) will be covered in lecture over the term.

2. **Lab.** The laboratory meets once per week. Labs are taught by a lab/recitation instructor in a class size of 24 students. The laboratory seeks to reinforce chemistry principles through a thematic nature (cancer, energy, and art). Students gain hands-on experience in chemistry lab work.

3. **Recitation.** Recitation sections are classes of 24 students (the same students as in the linked lab section) and are taught by the same instructor as the associated lab. Recitation meets once per week in a classroom setting to allow students to work in groups on assignments designed to reinforce the principles covered or used in the course.

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**LECTURE**

**Required materials:**

- Sapling Learning Access code ([http://www2.saplinglearning.com/](http://www2.saplinglearning.com/)).
- i>clicker2 ([http://www1.iclicker.com](http://www1.iclicker.com))
- Approved calculator: either a TI 30XS or a Casio FX115MS calculator. **No other calculator may be used on exams.** Any other calculator used at the exam will be taken away from the student.
- The text for the course (Chemistry: Structure and Properties, 1st Ed., by Tro) is recommended but not required. If you prefer, you may use any general chemistry source (textbook or open source such as [https://openstax.org/details/chemistry](https://openstax.org/details/chemistry)) provided you are comfortable matching the learning objectives in the syllabus to your source’s table of contents.

**Evaluation/Assessment for Lecture:**

1. Mid-Term Exams
2. Final Exam
3. Sapling Learning homework assignments
4. Sapling Learning reading assignments *(extra credit)*
5. In-class activities using i>clicker *(extra credit)*

1. **MID-TERM EXAMS:**

**Exam organization:** The course content in CHEM1415 is divided into eight units. The chapters/sections of the text covered on each exam are listed by the reading assignments within each learning objective in the syllabus (see pages 2–4). Questions on examinations may cover laboratory concepts, homework problem sets, Sapling assignments, class context and examples, or other course content. A portion of mid-term exams 2 and 3 may be comprehensive, covering materials from previous exam(s) in the term.

Although previous exams may be posted to Canvas for concept practice, students should not expect the same order, format and/or question types on the current semester exams.

**Alternate exam time** (Exams 1 – 3 only): Students who cannot attend scheduled mid-term exams 1-3 at 7:30 pm because of a job or class conflict or other University approved activity may take an alternate exam to be given earlier in the day on the same day of the mid-term exam [7:00 am; location to be announced]. Due to limited exam space and proctoring capabilities, students may not use the alternate exam time for personal reasons. Students who qualify to take an alternate exam must register in advance by providing all of the following information by noon on Monday of the exam week: Name, OU I.D., Lecture Instructor, Lab Instructor, reason why you cannot attend the scheduled exam, and the name and phone number where excuse can be verified (not yourself or a family member). Submit this registration by OU email to Dr. Clifford, the coordinator for general chemistry courses [clifford@ou.edu]. Include “CHEM 1415 alternate exam” in the subject line of the email. You must submit a registration for each alternate exam needed even if the conflict is a reoccurring one, such as a class. Early exams are returned to the student through their lab/recitation instructor at the next lab or recitation meeting.
2. **FINAL EXAM:**

Final exam: The final exam (200 points) is comprehensive in content, covering CHEM 1415 content from the term. All students will have the opportunity to replace their lowest mid-term exam score by using their comprehensive final exam percentage score. For example, a student scoring 67 out of 100 points on mid-term exam 3 (67%) but 145 points out of 200 on the final exam (72.5%) will be able to use this higher score (72.5 points out of 100 points) in place of mid-term exam 3.

3. **SAPLING HOMEWORK ASSIGNMENTS:**

Sapling Learning (http://www2.saplinglearning.com/) will be used for homework problem sets in the course. A maximum of 65 points will be awarded through the homework with fifteen problems sets assigned and the best thirteen scores used for the final grade. Sapling homework scores will not count unless submitted by the deadline indicated on the Sapling Learning website (date and time). **Sapling homework is due at 11:55 p.m. each Friday night, except for exam weeks when it is due on Wednesday night at 11:55 p.m.** It is strongly advised that students work on problems as the topics are covered in the unit, avoiding the tendency to wait until the day the assignment is due.

Make-ups: There are no make-ups for homework assignments since these are posted to Sapling Learning well in advance of the due date/time. Failure to have adequate wifi access, access to a computer, or internet/computer issues are not reasons for an extension. Scores from the highest thirteen of the fifteen assessed homework assignments will be used in the final grade calculation. Any missed homework problem sets, up to two, will be dropped and the student’s other thirteen scores used. After two missed assignments, subsequent missed assignments will factor in the final grade as zeros.

4. **SAPLING READING ASSIGNMENTS (extra credit):**

Sapling Learning (http://www2.saplinglearning.com/) will also be used for extra credit assignments, termed Sapling Reading Assignments (SRAs). SRAs are designed to help students prepare for the upcoming lecture content and will be available through Sapling Learning (http://www2.saplinglearning.com/). Fourteen SRAs will be available, with the percentage score converted to reflect a score out of three points each for a maximum of 42 extra credit points awarded for the term. Sapling reading assignment scores will not count unless submitted by the deadline (date and time). **The due time for the reading assignments (lecture prep) is 11:55 p.m. each Monday night.** It is strongly advised that students work on problems well in advance of the due date/time, and avoid waiting until the last minute to complete SRAs.

Make-ups: There are no make-ups for SRAs since these are posted to Sapling Learning well in advance of the due date/time. Failure to have adequate wifi access, access to a computer, or internet/computer issues are not reasons for an extension. There are no dropped SRA grades – all scores count as extra credit.

5. **IN-CLASS ACTIVITIES USING i>clicker (extra credit):**

**Clicker extra credit:** Instructors will use i>clicker2 personal response devices (clickers) to ask students questions to earn extra credit in class. A maximum of 20 points of extra credit is possible from clickers, with five points possible over each exam period. Extra credit points are divided by exam periods as Clicker EC1, EC2, EC3, and EC4. EC1 encompasses questions asked in class over Exam 1, EC2 covers Exam 2, EC3 covers Exam 3, and EC4 covers the period up to the final exam. Questions asked in class earn 1 “clicker point” per correct answer and 0 points for an incorrect answer.

At the end of the extra credit period, clicker points are converted to extra credit points for the course as follows:

- If at least half (50%) of the clicker points are earned per extra credit period, students are awarded the full 5 points possible.
- If less than half (50%) of the clicker points are earned, students are awarded the proportion of the points corresponding to the amount of credit amassed.

**Missed lecture, forgotten clicker, etc:** The 50% level whereby full points are awarded is also a means of covering various issues, including but not limited to, battery failure, forgetting to bring a clicker to lecture, or missing a lecture due to illness. Answers to clicker question on paper will not be accepted. Students can only be awarded points for the clicker registered to their name and on answers submitted in class.
ABSENCE(S):
1. Absence from Lecture
2. Absence from mid-term exam(s): University sanctioned event
3. Absence from mid-term exam(s): Illness, non-University sanctioned event, etc.
4. Absence from final exam

1. Absence from Lecture: While attendance and participation in lecture is strongly encouraged, attendance is not taken in lecture. Clicker extra credit (see previous) in lecture cannot be made up – missing lecture translates to missed clicker extra credit opportunities.

2. Absence from mid-term exam(s): University sanctioned event. Students who will be away from campus on an exam date due to a University sanctioned event should contact Dr. Clifford and finalize arrangements with a National Collegiate Testing Association testing center at least one week prior to the exam date (see the course Canvas page for instructions). NCTA centers have different requirements about setting up exams in advance; therefore, it is advisable to start this process well ahead of the one-week deadline, with an abundance of caution. An official letter and/or email from the University office, advisor, or organization is required.

3. Absence from mid-term exam(s): Illness, non-University sanctioned event, etc.: There are no make ups for missed exams. Students who miss an exam due to illness, family emergency, or for any reason will not be administered a make-up exam. In lieu of a make-up exam, the percentage score of the comprehensive final exam will be substituted for the score of the missed exam. For example, a student scoring 160 out of the 200 possible points on the final exam (80%) will be awarded a score of 80 points out of 100 points for the missed mid-term exam. Students missing more than one mid-term exam should contact Dr. Clifford with documentation of the absences.

4. Absence from final exam: Students absent for the final exam due to illness must submit a doctor’s note in order to qualify for a make-up final exam to be held by the end of the finals week period.

LABORATORY

Required materials/procedures:
- Laboratory Activities: Available for download/printing from Canvas
- Approved safety goggles: Must be purchased by or at the first laboratory meeting
- Lab notebook
- 2 GB flash drive
- Attendance: Attendance will be recorded within the first ten minutes of the laboratory period. Students who are not present at the time attendance is recorded will be considered absent and will not be allowed to make up the laboratory without a valid documentation (doctor’s note, University sponsored event advisor letter, military duty, etc.). Documentation must be provided to the laboratory instructor within 48 hours of missing the laboratory.
- Lab check-in: Students will be assigned a lab drawer/locker on the first day of laboratory. Each student will account for his/her supplies at check-in and will vouch for the condition of the equipment, requesting replacements for dirty, damaged, or unusable items.
- Lab check-out: Students must check out of their laboratory locker at the end of the term at the last laboratory meeting. Failure to check out on the assigned day at the assigned laboratory time will result in being assessed a $75 check-out fee. Students who withdraw from the class must attend the next regular laboratory session in order to check out of their locker or they will be assessed a $75 check out fee. Students who withdraw may not arrange a special time with their TA in order to check out. For any extenuating circumstances, contact the General Chemistry Coordinator (Dr. Clifford, lclifford@ou.edu).
- Familiarity with using Canvas dropbox and turnitin.com: All lab reports will be submitted to the dropbox of Canvas, and turnitin.com will be used to check for plagiarized content. Laboratory instructors will provide information on how to use the dropbox on Canvas.
**Evaluation/Assessment for Laboratory:**

1. **Laboratory Reports (10):** Laboratory report grades will be based on ten laboratory reports worth 15 pts each, submitted to the Canvas dropbox of the lab/recitation section. No laboratory report scores are dropped – all count towards a student’s final grade. See the Canvas course calendar for a schedule of laboratory activities. Laboratory activities may be printed from Canvas. The lab/recitation instructor will provide more details on the pre-lab and lab report expectations, including rubrics for the grading of laboratory reports.

   A portion of the laboratory report will be assigned as a pre-lab assignment, due by midnight the night prior to the student’s lab period. Failure to complete the pre-lab by the due date/time may result in the laboratory instructor not allowing the student to attend/complete the laboratory due to safety considerations.

2. **Full Laboratory Report (1):** Students will complete one full laboratory report worth 75 points. A five page minimum scholarly/academic paper, written outside of class, with appropriate references is required for all general education science courses at OU. During the semester students will prepare for this paper in lecture, recitation and lab activities.

   The full laboratory report will be graded based on quality of scientific writing and completion. The writing assignment will be a full 5-page lab report completed over the last 3 weeks of the lab semester, including completing the experiment, writing the initial report, peer-review of the report during class time, and a final draft submission. Both the initial draft of the report and the final submission will be submitted electronically via turnitin.com on Canvas and checked for originality.

**ABSENCE(S):**

1. **Absence from Laboratory:** Students who are absent from the laboratory must provide valid documentation (including but not limited to a doctor’s note for illness, a University sponsored event advisor letter, military duty, immigration status meetings, child custody hearings, government proceedings, etc.) within 48 hours of the missed laboratory period in order to be given permission to make up the missed laboratory. Oversleeping is not an excused absence. Students with valid, documented excuses should contact their laboratory instructor for the make-up procedure, as the lab should be made up within one week’s time. If a make-up lab is warranted, a make-up slip will be issued by the student’s laboratory instructor. This make-up slip will be used by the student to attend another section’s laboratory period. The make-up laboratory must 1) be in the same room as the student’s normal laboratory (students will need to access their lab drawers for equipment), and 2) start at the make-up laboratory’s normal start time. When possible, kindly obtain the name of the make-up laboratory’s instructor and email him/her to ask permission in advance.

   Students with valid, documentable excuses who are unable to make up a missed laboratory within one week’s time will make up the missed laboratory at the end of the term. This is a last resort only for students who cannot make up the course laboratory content in the usual one week time frame.

2. **Absence from Peer-Review Evaluation Laboratory meeting:** Students absent from the Peer-Review session must provide documentation as with any absence from all other laboratory meetings (see above). As a make-up, students will use end of the term make-up for the missed 15 points of the peer review.
RECI TATION

Required materials/procedures:

- Recitation activities: May be posted to Canvas by the recitation instructor, to be printed in advance of the recitation meeting.
- Attendance: Attendance will be recorded within the first ten minutes of the recitation period. Students who are not present at the time attendance is recorded will be considered absent and will not be allowed to receive a grade for the recitation activity for the day, though they may still participate in the remainder of the recitation period.

Evaluation/Assessment for Recitation:

1. Recitation activity grades: Twelve recitation grades will be recorded with the best nine out of the twelve applied to the final grade calculation. Recitation meets every week of the term including the first day/week of class; however, there are some weeks where recitation will be a review/prep for the exam and a grade will not be assessed. On these rare occasions, no “R-#” appears on the Canvas course calendar, though recitation still meets. Days when recitation grades will be recorded are designated “R-#” on the course Canvas calendar.

ABSENCE(S):

There are no make-ups for recitation as students can miss three recitation grades with no effect on their grade. Absences due to illness or any other reason will all be treated in the same manner; however, it is strongly recommended that you let your recitation instructor know if you are ill prior to the start of recitation so that he/she may let you know of any important information that was disseminated during recitation.

Use your absences prudently. For example, a student who misses three recitations for no valid, documentable reason (illness, family emergency, etc.) and then misses a fourth for an unavoidable reason (funeral, illness, etc.) will NOT be allowed to make up the fourth missed recitation. This may negatively impact a student’s grade at the end of term.

EXAM POLICIES (M ID-TERMS AND FINAL EXAM)

Please note the following policies:

- ID is required: You must bring your OU I.D. or some other form of photo identification to all exams. Scantrons and adequate paper to work problems will be provided at each exam within the exam packet. You may not bring your own scratch paper or your own periodic table at the exam.

- No electronic devices are permitted: Electronic communication devices including but not limited to Apple Watches, cellular phones, pagers, FM receivers, headphones, music devices of any sort, etc. are banned from examination rooms and may not be in a student’s exam space (desk, floor around) or on their person (in a pocket, on their lap). Individuals for whom circumstances make the possession of such devices necessary must be approved by their laboratory/recitation instructor prior to an examination to make arrangements. Students found with an unauthorized electronic device in their exam space or on their person may be charged with academic misconduct, whether or not the device was in use or not at the time it was discovered.

- Exam completion: When time is called for the exam, students must immediately cease writing on the scantron answer sheet. This includes filling in the scantron for exam question answers, name, ID, exam version, and all coding necessary for the grading of the exam. Exam proctors will not accept any exams from students who continued to fill in scantron bubbles after time was called.

- Exam rooms: Exam rooms are assigned by Classroom Management. The general chemistry program cannot guarantee or control the size of the workspace area (tablet arm versus table), the functioning of exam room clocks, the temperature of the room, or the lighting. The teaching assistants in the exam rooms will announce minutes remaining in the exam at regular intervals once 30 minutes of the exam remain, even if there is a clock present in the room. Since students may not use their cell phones during the exam, plan to wear a non-Apple watch if you wish to monitor the exam time more closely.
• **Approved calculators only:** The only calculators allowed at the exam are the TI 30XS or Cassio FX115MS calculators. No other calculator may be used on this exam. Since cell phones are not allowed, you may not use the calculator function of a cell phone. You will be expected to use an appropriate calculator on all recitation and lab assignments as well as examinations so that you are well versed in the function of the calculator for the exams. Students using calculators on exams that have not been approved may be charged with academic misconduct.

• **Exam location:** Make sure you know where your assigned testing site is before the exam. Exam room assignments will be sent by email and will be posted to the course website. Students who arrive more than ten minutes late to an exam, or arrive after another student has left, will not be allowed to take the examination.

• **Exam grade discrepancies on Canvas:** Following each exam, an email will be sent by the general chemistry coordinator informing students that exam grades have been posted to Canvas. Students will have one week after this email is sent to report exam grade discrepancies for correction. After this stated deadline, there will be no changes to a student’s exam grade. Students will be directed to 1000 SLSRC for any grade discrepancies, including but not limited to missing or incorrect ID numbers on the scantron.

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**GENERAL NOTES ON GRADING & GRADE DISCREPANCIES:**

**Canvas:** Grades may be viewed on the Canvas website for the course (canvas.ou.edu). Please note that most grades will not appear immediately on Canvas as they will be intermittently updated during the term. Students will be notified via email by the General Chemistry Coordinator when grades are posted to Canvas. Once notified by Dr. Clifford of grade postings, students must abide by the deadline to correct any grade discrepancies. After the noted deadline, usually one week, no changes will be made.

**Deadline for any grade changes:** Students have one week following the posting of any grades to the course Canvas page or the lab/recitation Canvas gradebook in order to address grade discrepancies. Included are all exam, lab, recitation, lecture prep assignments, homework, extra credit Sapling Reading Assignments, and extra credit clicker grades. After this one week time, no changes will be made regarding missing or incorrect grades.

**What do to for Grade Discrepancies:**

1. **Lab Report grades:** Save all graded lab reports (view scores in Canvas). In the event of a discrepancy, you will need to provide information on the original, graded lab report for verification. Discrepancies in lab report grades should be reconciled with your laboratory/recitation instructor within one week after the grade has been posted to the lab/recitation Canvas gradebook.

2. **Recitation Grades:** Save all graded recitation activities returned to you by your recitation instructor. In the event of a discrepancy, you will need to provide information on the original, graded lab report for verification. Discrepancies in recitation grades should be reconciled with your laboratory/recitation instructor within one week after the grade has been posted to the lab/recitation Canvas gradebook.

3. **Exam Grades:** Discrepancies with exam grades posted to Canvas (including grade of zero for missing/incorrect OU ID) should be resolved within one week after the grade has been posted to the course Canvas gradebook. Students needing to reconcile exam grade discrepancies should bring their OU ID and exam paper (blue/pink/tan/gold exam) to request a hand-grade of the scantron from the Department of Chemistry & Biochemistry office staff (1000 SLSRC, 8 a.m. – 5 p.m.).

4. **Sapling Learning grades (homework or SRA):** Discrepancies in Sapling Learning grades (homework or reading assignments) should be reported within one week to the Gen. Chem. Coordinator (lclifford@ou.edu) once the grade has been posted to Canvas.

5. **Clicker extra credit:** Any discrepancies with clicker extra credit scores must be addressed to the lecture instructor assigned to the student. Although emails asking students to check grades are sent by the General Chemistry Coordinator, only the lecture instructor has the clicker data (e.g. clicker IDs and recorded responses) to address discrepancies.
FINAL GRADES

**Final grade determination:** Final grades will be determined by summing the scores noted previously in the syllabus (lab, recitation, exams, homework assignments, and the safety, integrity and syllabus quizzes). After the course points are summarized and the grade calculated, the extra credit points earned by the student will be added to this total. The final letter grade issued to the student will be that as determined by comparison of the sum of the course points plus extra credit points to the scale outlined previously on page 4 of the syllabus. Students should not expect a curve in the course; however, the instructors reserve the right to adjust cutoffs.

**Final grades:** Final grades are just that – final. Only in the event of an administrative error will grades be changed, and the only changes that will be made are those for which the time period for reporting errors/discrepancies is still valid (one week from the reporting of an exam score, for example). Grades are issued based on the student’s accumulated points. Once issued, grades will not be altered based on a student’s desire to achieve a higher score. Grades will also not be altered to fail a student desiring to replace the course grade and improve his/her GPA with retaking the course.

**What if my grade is really close to the cutoff?** Unfortunately, in a course of this size there is no possible way to prevent some students from being very close to the grade cutoffs. With as many students as are taking general chemistry, it is simply impossible to treat each student as a special case and be fair to other students. No grade change will be made solely on the basis of a student wishing to achieve a higher grade that was not determined by the listed cutoffs. Also, there is no extraneous extra credit and no possibility of rewriting laboratory reports or recitation assignments. Do not request additional extra credit from your lecture instructor, your lab/recitation instructor, or the General Chemistry Coordinator.

UNIVERSITY POLICIES & NOTES

**Disability Resource Center:** The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the professor as early in the semester as possible. Students with disabilities must be registered with the Disability Resource Center prior to receiving accommodations in this course. The Disability Resource Center is located at 730 College Ave., phone 405/325-3852 or TDD only 405/325-4173.

**University General Information:** Each student should acquaint her or his self with the University’s codes, policies, and procedures involving academic misconduct, grievances, sexual and ethnic harassment, and discrimination based on physical handicap.

**Religious Observance:** It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty.

**Adjustments for Pregnancy/Childbirth Related Issues:** Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact your instructor as soon as possible to discuss. Generally, modifications will be made where medically necessary and similar in scope to accommodations based on temporary disability. Please see [www.ou.edu/content/eoo/pregnancyfaqs.html](http://www.ou.edu/content/eoo/pregnancyfaqs.html) for commonly asked questions.

**Title IX Resources:** For any concerns regarding gender-based discrimination, sexual harassment, sexual misconduct, stalking, or intimate partner violence, the University offers a variety of resources, including advocates on-call 24.7, counseling services, mutual no contact orders, scheduling adjustments and disciplinary sanctions against the perpetrator. Please contact the Sexual Misconduct Office 405-325-2215 (8-5) or the Sexual Assault Response Team 405-615-0013 (24.7) to learn more or to report an incident.

**Academic misconduct:** Students engaging in academic misconduct (including cheating, plagiarism, and any other action that may improperly affect evaluation) will be subject to sanctions in accordance with the Student’s Guide to Academic Integrity at [http://integrity.ou.edu/students_guide.html](http://integrity.ou.edu/students_guide.html). Academic misconduct of any kind will not be tolerated. Academic Misconduct is defined as any act which improperly affects the evaluation of a student’s academic performance or achievement. Misconduct occurs when the student either knows or reasonably should know that the act constitutes misconduct. “I didn’t know it was plagiarizing/cheating” is never an excuse for academic misconduct.
Academic misconduct of any kind will be dealt with by official University channels and will be punishable by penalties including receiving a grade of “F” for the course and/or expulsion from the University. Any papers, writings, or materials that are deemed suspicious by the instructor or the exam proctors will be confiscated and/or documented for misconduct procedures as considered appropriate (e.g. photographs of writing on surfaces). You should understand that your instructors take these matters seriously. Students who are caught in any form of academic misconduct should expect extremely severe penalties. Turnitin will be used for laboratory report submissions, checking for plagiarism.

Students may report cheating of other students, especially cheating that occurs during exams. To do so, contact Ms. Brea Clark or Mr. Will Spain of the Office of Academic Integrity Programs at integrity.ou.edu.

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**EMAIL COMMUNICATION**

**Email Etiquette:** In order to aid communication, the University has established email as an acceptable means of official communication. All University students are assigned an official University email account and your lecture instructor, your lab/recitation instructor, and the General Chemistry Coordinator will be communicating with you through this account frequently.

Please note the following guidelines:

- Email sent to your University email account is expected to be read by you in a timely fashion (e.g. once per day). For convenience, you can arrange to have your email forwarded to another email account (go to [accounts.ou.edu](http://accounts.ou.edu)); however, the University warns that you do so at your own risk. Failure to receive or read the communications sent to you via your official email account in a timely manner does not absolve you from knowing the information contained in the communication.
- **Email will only be answered if it comes from an @ou.edu email address.** University junk mail filters are such that instructors may not see any emails sent from non-University accounts.
- Emails sent to lecture instructors and lab/recitation instructors should have a subject line that indicates your name, course number, and section number. For example, “Jane Smith, CHEM 1415-001 – Sapling problem” is helpful to the instructor. If the email is to your lab/recitation instructor, use your lab/recitation section number instead.
- **General etiquette:** Your lecture and lab/recitation instructors will treat you as a professional, and ask that you respond in kind. Kindly use appropriate salutations in email communication (“Dear Dr. Jones” or “Dear Professor Jones” as opposed to “Hey Jones”), use appropriate punctuation and capitalization, and **end with your first and last name.** AVOID UPPERCASE BECAUSE IT LOOKS LIKE YOU ARE SHOUTING.
- If your email is asking one of the instructional staff to address grading concerns (Exam grade, Sapling score, etc.), be sure to include your OU ID with your full name.

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**Class Conduct**

**Be ready for lecture/lab/recitation:** In order to make the most out of your education, prepare for each lecture, lab, and recitation by completing the assigned readings and by working problems through Sapling.

Please note the following:

1. Turn off/silence all cell phones, laptops, tablets, etc. Interruptions bother your classmates more than the instructor, so please be respectful to those seated around you.
2. Do not use electronic devices unnecessarily. If you attend lecture, it’s to learn the material and not to watch videos on your computer or to text friends. While instructors usually aren’t aware of this behavior, many students complain every term about the distracting behavior of those seated nearby.
3. Do not talk during class outside of the in-class activities (clicker questions, recitation assignments, lab activities). If you believe sitting at the back of the lecture hall means that it’s okay to talk, keep in mind that many students have tight schedules and must arrive when there is nowhere else to sit but the back. Your classmates are paying for their education just like you – don’t interfere with their learning by talking incessantly when it’s not warranted.
GENERAL TERM INFORMATION

**Laboratory and recitation will begin the first week of class:** You should bring paper, pen and pencil, lab or recitation materials, and an approved calculator to laboratory and recitation meetings. Students who do not check into laboratory during the first scheduled laboratory class may lose their space and be dropped from lab. All students enrolled in the lecture portion of the course must also be enrolled in a Chem 1415 laboratory/recitation section. Appropriate attire is required in the laboratory at all times (safety goggles, appropriate clothing and shoes, etc.), and will be explained by your lab instructor.

**Placement exams:** The CLEP office in the Center for Independent and Distance Learning (CIDL) conducts the exams to obtain advanced placement credit for CHEM 1315 and CHEM 1415. Contact the Department of Chemistry and Biochemistry Advisor, Mr. Lance Goins, for additional information (email ldg123@ou.edu or phone 325-4121) or the CIDL at 325-1921.

**Last day to withdraw:** The final day to withdraw from the course is October 28th, 2016. Students who stop attending but who do not officially withdraw from the course will be assigned a final course grade.

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**Need Additional Help?**

Besides normal class attendance in the lecture, recitation, and laboratory, students have several opportunities available to enhance their level of learning in the course.

**Help Lab:** The General Chemistry Help Lab is located in PHSC 303 and will be available starting the second week of class. The Help Lab, staffed by General Chemistry Teaching Assistants for both CHEM 1315 and CHEM 1415, is available for assistance on a walk-in basis [operational hours and staff to be posted to the course Canvas website after the start of the term]. Students can ask questions regarding any course content (lecture, lab, recitation, etc.). An honest effort must have been made on assignments/problems so that the Help Room staff can adequately help to clarify concepts.

**University College’s Action Center and Action Tutoring:** The Chemistry 1415 Action Center is an active and collaborative forum in which students work on problems together and receive assistance from instructors and Peer Learning Assistants in order to understand and master general chemistry concepts. Participation in the Chemistry 1415 Action Center is strongly recommended for all students, whether you need assistance or you want to ensure your mastery of the concepts. Regular participation has been shown to lead to positive results in class performance. Bring your OU ID, text, and notes. UC Action Tutoring will be available on a drop-in basis during evening hours (8 – 10 p.m., usually Monday through Thursday) in Adams Center, Muldrow Tower 105, next to Cane’s Chicken. University College Action Tutoring begins the second week of class. These are free, come-and-go sessions with trained Peer Learning Assistants. To view the finalized schedule, or for more information, visit http://uc.ou.edu/action.

**Study Groups:** Self-organized and independent meetings of small groups of students on a regular basis (weekly or semi-weekly, for example) to discuss homework and previous exam problems serves as another possible way to help many students discover misunderstandings and improve their performance on examinations.

**Course Website:** A course website is available for CHEM1415 at http://canvas.ou.edu/. The CHEM1415 instructor(s) may make lecture notes available on the course website.

**Office Hours:** Laboratory and lecture instructors have office hours to help students (see page 1). Students may attend any CHEM 1415 instructor’s office hours.

**Tutoring list:** The Undergraduate Program Assistant in the Department of Chemistry & Biochemistry office (cheminstruct@ou.edu or 325-4811) and Departmental Advisor, Mr. Goins (ldg123@ou.edu or 325-4121), maintain a list of tutors for private hire who may be interested in tutoring individual students or groups of students in chemistry courses. This is done only for the convenience of students and the Department of Chemistry and Biochemistry does not recommend the relative merits of the individuals who have requested to tutor students. Students interested in the tutor list are encouraged to consult with previous students for references and recommendations. The tutor list is generally not available until the second week of class. Please use the subject line “General Chemistry Tutor List request” so that your email may be directed accordingly.

**Previous Exams:** Copies of recent exams are available online at the course website at https://canvas.ou.edu. Although previous exams from past terms will be posted to Canvas for concept practice, students should not expect the same format and/or question types on the current semester exams. The number of exam questions and point total per question will vary per exam. Not all
material in the previous CHEM 1415 courses may be covered in the current term, and some new material may be incorporated that was not previously covered. Students should not rely solely on previous exams as a means of preparing for an exam.

**Homework and Sapling Reading Assignments:** Homework problem sets and reading assignment sets are available through Sapling Learning. You will have multiple attempts at each question. Additional practice problems (not for credit) can also be found at the end of the chapters in your textbook. The answers to many of these problems in the text are in the back of the textbook. These solutions should only be examined after working/attempting the problem.

**Computer lab resources:** The University has computer laboratories at several locations. Check [www.ou.edu](http://www.ou.edu) for campus resources.

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### Additional contact information relevant to CHEM 1415:

<table>
<thead>
<tr>
<th>Name</th>
<th>Function</th>
<th>email</th>
<th>Office</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Clifford</td>
<td>Gen. Chem. Coordinator</td>
<td><a href="mailto:lclifford@ou.edu">lclifford@ou.edu</a></td>
<td>1570 SLSRC (MWF)</td>
<td>325-4383</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>119 CHBA (TR)</td>
<td>325-3316</td>
</tr>
<tr>
<td>Dr. Martyn</td>
<td>Instructional Lab Developer</td>
<td><a href="mailto:tmartyn@ou.edu">tmartyn@ou.edu</a></td>
<td>1565 SLSRC</td>
<td>325-3751</td>
</tr>
<tr>
<td>(Chem office staff)</td>
<td>Undergrad. Program Assist.</td>
<td><a href="mailto:cheminstruct@ou.edu">cheminstruct@ou.edu</a></td>
<td>1000 SLSRC</td>
<td>325-4811</td>
</tr>
<tr>
<td>Ms. Kim Moser</td>
<td>ILS Coordinator</td>
<td><a href="mailto:Kimberly.A.Moser-1@ou.edu">Kimberly.A.Moser-1@ou.edu</a></td>
<td>CHBA 116</td>
<td>325-2742</td>
</tr>
<tr>
<td>Mr. Lance Goins</td>
<td>Dept. Advising Office</td>
<td><a href="mailto:ldg123@ou.edu">ldg123@ou.edu</a></td>
<td>CHBA 214</td>
<td>325-4121</td>
</tr>
</tbody>
</table>
CHEMISTRY 1415 LABORATORY OUTLINE
Fall 2016

The following outline is a guideline for all sections of Chemistry 1415. Each teaching assistant may have some more specific instructions and requirements in certain areas. A directory of teaching assistants and other personnel will be posted on the bulletin board outside of CHBA 116 and on the course web site.

Required materials:

1. **Laboratory manual activities**: Printed out from Canvas website
2. **Lab Notebook**: Permanently-bound notebook with at least 70 pages. A composition book is fine.
3. **Flash Drive**: 2 GB minimum
4. **Approved safety goggles**: Must be purchased before check-in during the first lab period

**The State of Oklahoma requires you to wear safety goggles in the laboratory at all times.** Suitable goggles will be sold during the first two weeks of school in your lab. While other outlets also sell goggles, you must make sure they meet state safety standards for laboratory use.

Laboratory Schedule:

<table>
<thead>
<tr>
<th>Check-in and Safety</th>
<th>Monday, August 22, 2016</th>
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<tbody>
<tr>
<td><strong>Safety Quiz DUE on Canvas (On lecture course site)</strong></td>
<td><strong>Friday, August 26, 2016</strong></td>
</tr>
<tr>
<td>1415-01: Dilution is the Solution</td>
<td>Monday, August 29, 2016</td>
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<tr>
<td>1415-02: Galvanized Nails</td>
<td>Tuesday, September 6, 2016</td>
</tr>
<tr>
<td>1415-03: Copper Ammonia Spectroscopy</td>
<td>Tuesday, September 13, 2016</td>
</tr>
<tr>
<td>1415-04: Active Metals</td>
<td>Tuesday, September 20, 2016</td>
</tr>
<tr>
<td>1415-05: Driving Forces</td>
<td>Tuesday, September 27, 2016</td>
</tr>
<tr>
<td>1415-06: Make it Visible</td>
<td>Tuesday, October 4, 2016</td>
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<tr>
<td>1415-07: Strong Bones</td>
<td>Tuesday, October 11, 2016</td>
</tr>
<tr>
<td>1415-08: Sort it Out</td>
<td>Tuesday, October 18, 2016</td>
</tr>
<tr>
<td>1415-09: Harnessing Energy</td>
<td>Tuesday, October 25, 2016</td>
</tr>
<tr>
<td>1415-10: Directionality vs. Speed</td>
<td>Tuesday, November 1, 2016</td>
</tr>
<tr>
<td>1415-11: Strength of Solution</td>
<td>Tuesday, November 8, 2016</td>
</tr>
<tr>
<td>Peer Review</td>
<td>Tuesday, November 15, 2016</td>
</tr>
<tr>
<td>Final Paper Due</td>
<td>Tuesday, November 29, 2016</td>
</tr>
<tr>
<td><strong>Check-out ($75 penalty if missed!)</strong></td>
<td>Tuesday, November 29, 2016</td>
</tr>
</tbody>
</table>

Recitation: Recitation Sections will meet every week from the first day to the last day of the term.

**Laboratory safety quiz:** The laboratory safety quiz on Canvas must be completed by Friday, August 26, 2016. Completion of the laboratory safety video quiz is required to attend lab.

Due Dates:
A portion of the laboratory report will be assigned as a pre-lab assignment, due by midnight the night prior to the student’s lab period. Failure to complete the pre-lab by the due date/time will result in the laboratory instructor not allowing the student to attend/complete the laboratory due to safety considerations.

Weekly lab reports are due 48 hours after the laboratory is completed. All reports will be submitted to the TAs Canvas site and will be checked for plagiarism using Turnitin.com.
Unless prior arrangements have been made with your TA, or unless a documented health or personal emergency occurs, lab reports not turned in at the designated time will be penalized 2 points per day. Reports more than five days late will not be accepted.

General Laboratory Information:

CHECK-IN: Students will be assigned a drawer on the first day of laboratory. Each student will account for his/her supplies at check-in and will vouch for the condition of the equipment, requesting replacements from the Instructional Laboratory Stockroom (ILS) for damaged or unusable items. All missing, broken, or damaged items should be replaced by ILS at this time at no charge. Any equipment that cannot be replaced by ILS on the first day of laboratory will be listed as a “check-in shortage” on the record card. During the semester, any equipment that is broken or damaged will be recorded on the record card. Students must use PEN when filling out their record cards at check-in.

Since students will often be sharing equipment with a lab partner, it is imperative that each student account for their equipment at the end of every laboratory period. Students are held financially responsible for all equipment issued to them at check-in. The cost of replacement/repair for missing/damaged equipment will be billed to students through the bursar’s office as a “breakage fee.” Please note that this “breakage fee” is not the same as the “service charge” paid with other registration fees. The “service charge” is intended to partially cover the cost of chemicals and other consumable items used in the laboratory.

Keep your equipment drawer locked. You will ultimately be responsible for equipment if it is stolen from you.

CHECK-OUT: Students must check out of their laboratory drawer at the end of the term. Failure to check out on the assigned day at the assigned laboratory time will result in being assessed a $75 check-out fee. Students who withdraw from the class must attend the next regular laboratory session in order to check out of their drawer or they will be assessed a $75 check out fee. Students who withdraw may not arrange a special time with their TA in order to check out. Any absences from the laboratory check-out due to valid reasons must be accompanied by written documentation or the $75 check-out fee will be assessed.

ABSENCE(S):

Attendance in lab: Lab periods are three hours long. Please utilize this time wisely: planning your experiments, collecting data, and writing reports. Attendance will be recorded within the first ten minutes of the laboratory period. Attendance will be posted on Canvas through the lab/recitation Canvas page. Once posted, students will have one week to contact the TA regarding inaccuracies. After the one week period, no changes will be made. Students turning in lab reports for a laboratory period when they were absent will be charged with academic misconduct.

1. Absence from Laboratory: Students who are absent from the laboratory must provide valid documentation (including but not limited to a doctor’s note for illness, a University sponsored event advisor letter, military duty, immigration status meetings, child custody hearings, government proceedings, etc.) within 48 hours of the missed laboratory period in order to be given permission to make up the missed laboratory. Oversleeping is not an excused absence. Students with valid, documented excuses should contact their laboratory instructor for the make-up procedure, as the lab should be made up within one week’s time. If a make-up lab is warranted, a make-up slip will be issued by the student’s laboratory instructor. This make-up slip will be used by the student to attend another section’s laboratory period. The make-up laboratory must 1) be in the same room as the student’s normal laboratory (students will need to access their lab drawers for equipment), and 2) start at the make-up laboratory’s normal start time. When possible, kindly obtain the name of the make-up laboratory’s instructor and email him/her to ask permission in advance.
Students with valid, documentable excuses who are unable to make up a missed laboratory within one week’s time will make up the missed laboratory at the end of the term. This is a last resort only for students who cannot make up the course laboratory content in the usual one week time frame.

End of semester make-up labs (December 6, 7, 8 times to be announced) are reserved for documented absences that prevent a student from attending all classes for a full week. Every effort should be made to make-up a missed lab during the week of the missed laboratory. Unfortunately, there is NO provision for making up laboratory work after the last scheduled laboratory experiment of the semester. This is true no matter what the reason.

2. Absence from Peer-Review Evaluation Laboratory meeting: Students absent from the Peer-Review session must provide documentation as with any absence from all other laboratory meetings (see above). As a make-up, students will use end of the term make-up for the missed 15 points of the peer review.

GRADING:
Laboratory grades will be based on ten reports worth 15 pts each and a final report worth 75 points. Make-ups for laboratories will require an appropriate and verifiable excuse. See your laboratory instructor for appropriate make-up procedures.

Your laboratory grade will depend on the laboratory reports, including pre-lab activities. Your laboratory instructor will grade these reports using specific criteria including:

1. Was the report submitted on time?
2. Does the work presented reflect the allotted time?
3. Is all the work of the lab exercise attempted?
4. Does the data reasonably reflect good laboratory technique?
5. Do the explanations and conclusions represent a good quantitative understanding of the laboratory exercise?
6. Are the conclusions logically related to the data collected by the students?

Grading Rubric for Weekly Reports

<table>
<thead>
<tr>
<th>Grading Criteria</th>
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<tbody>
<tr>
<td>Preparation</td>
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<tr>
<td>Prelab is</td>
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<tr>
<td>Complete</td>
</tr>
<tr>
<td>On-time</td>
</tr>
<tr>
<td>Accurate</td>
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<tr>
<td>Experimental Data</td>
</tr>
<tr>
<td>All Data present</td>
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<tr>
<td>Data follows correct trend</td>
</tr>
<tr>
<td>Data is fully discussed</td>
</tr>
<tr>
<td>Organization</td>
</tr>
<tr>
<td>All responses are in complete sentences or tabulated.</td>
</tr>
<tr>
<td>References in ACS format</td>
</tr>
<tr>
<td>References are cited in text.</td>
</tr>
<tr>
<td>Analysis – Conceptual</td>
</tr>
<tr>
<td>Macromolecular/ microscopic connection is made</td>
</tr>
<tr>
<td>Analysis – Quantitative</td>
</tr>
<tr>
<td>Work is shown for calculations</td>
</tr>
<tr>
<td>Calculations are correct and complete.</td>
</tr>
<tr>
<td>Units, significant figures and error bars are complete.</td>
</tr>
</tbody>
</table>

These criteria will be applied to the laboratory report as a whole rather than to individual sections of the report. Laboratory reports are assigned grades between 0 and 15 points.

The final report for experiment 11 will be graded out of 75 points. With 15 points for completion of experiment 11, 15 points for a complete peer review and 45 points for the complete, quality report. Refer to the rubric posted to Canvas for further details.
WORKING IN PAIRS: Students will work in pairs during most laboratory sessions, with a few exceptions. Each student is expected to complete and turn in their own unique individual laboratory reports via their lab/recitation instructor’s Canvas page dropbox. Turnitin.com will be used for laboratory report submissions, checking for plagiarism.

The following regulations will apply to this policy:
1. If one partner is absent or late, the laboratory instructor will assign the attending student to another partner.
2. The laboratory instructor will reassign partnerships at his/her discretion or at a student request at any time during the term.
3. Students are free to work alone if they so desire.
4. Both partners must be present for the whole period to be eligible to receive credit for a laboratory report. The partner who misses a laboratory is solely responsible for making up the activity and will not be allowed to use his/her partner’s data.
5. No more than two students may constitute a partnership except by permission of the instructor.
6. Students are encouraged to finish laboratory reports during the period of the laboratory activity.
7. Each student should be prepared to submit a copy of their collected data to the instructor in charge before leaving.
8. Students should submit reports and make conclusions based on their data collected by them and their partner, arrived at independently of other students, and stated in their own words. Any evidence of falsifying data, copying web content, or copying conclusions from other students (present or past) will be used in academic misconduct proceedings against the students involved.
9. Both partners are expected to contribute to the collection and interpretation of data. Students who do not do their part may be assigned a new partner or be asked to do their laboratory work independently.
10. Each student of the pair must submit a lab report via the laboratory instructor’s Canvas page dropbox. Only the data collected should be identical between the partners’ lab reports.

Conduct: Each student is expected to conduct themselves accordingly both in lab and at the ILS. Any inappropriate behavior or comments to staff may result in being removed from the laboratory for the day. Students asked to leave the laboratory will not be allowed to make-up the missed laboratory.

SAFETY:
Safe laboratory practice is based on understanding and respect, not fear. The regulations below are intended to help you work safely with chemical reagents. Do not hesitate to consult with your instructors if you have questions about any experiment or about these regulations.

Instructional Laboratory Safety Rules and Procedures
In case of an accident, summon the laboratory instructor immediately. If you receive a chemical burn, immediately flush the burned area with cold water, then ask another student to summon the instructor immediately. Safety showers are available in all labs.

Minimum Attire and Personal Protective Equipment (PPE) Requirements for Laboratories
The following minimum attire and PPE requirements pertain to all undergraduate instructional laboratories.

Attire when occupying a Laboratory
- Full length pants (or equivalent) and closed toe/heel shoe attire must be worn at all times by all students and other workers who are occupying or entering a laboratory area. The area of skin between the pants and shoe should not be exposed.
- Long hair and loose clothing must be confined while in a laboratory.
PPE when working with, or adjacent to, hazardous material use areas within a Laboratory.

- **Protective eyewear** is required to be worn by all students working with hazardous materials.
- In addition, laboratory personnel occupying the adjacent area, who have the potential to be exposed to chemical splashes or other hazards are required to wear protective eyewear.
- All protective eyewear must be appropriate for the work being done. The Department of Chemistry and Biochemistry has approved splash-proof goggles for this purpose.
- Some operations and procedures may warrant additional PPE, these might include **Protective gloves**, face shields, aprons, or respiratory protection. The PPE must be appropriate for the material or process being used and must not interfere with the ability of the student to work safely.

**General Conduct:**

1. Eating, drinking or smoking is forbidden in the laboratory.
2. DO NOT perform unauthorized experiments or work in a laboratory alone. If make-up work is to be done, it must be carried out under supervision. Always obtain the instructor’s permission before carrying out any experiment that is not in the laboratory manual.
3. Acts of carelessness or mischief are forbidden. Chemicals and equipment may be handled only in prescribed ways and for prescribed purposes. Such activities as pushing, chasing, and threatening people with any chemical or piece of equipment are not tolerated.
4. Know the location and proper use of fire extinguishers, fire blankets, safety showers, eye wash devices, and first aid kits.

**Lab Hygiene**

5. All personal belongings should be placed in the appropriate designated spaces as you enter the laboratory.
6. Before leaving the laboratory, make sure your work area is clean and dry. Ensure that all gas, water, vacuum, and air valves are completely turned off.
7. Spilled chemicals, broken glassware, etc. should be cleaned up carefully and without delay.
8. The floor should be kept free of obstructions or slipping hazards (e.g., spilled ice, pencils, etc.).
9. Insoluble materials (paper, glass, compounds, etc.) falling into a sink or drain should be removed immediately.
10. Under all circumstances, appropriate chemical disposal should be followed. Ask the instructor for specific information.
11. Before removing a chemical from a bottle, read the label carefully.
12. Thoroughly wash your hands after leaving the laboratory.

**Basic Lab Procedures**

13. Never pour water into concentrated acids. Always pour acid slowly into water while constantly stirring.
14. If you are instructed to smell a chemical, gently fan the vapors toward your face. Never smell a chemical by putting your nose over the container.
15. Never take chemical bottles to your desk. Instead, obtain the material from the bottle in a clean container (beaker, flask, or weighing boat or paper). Do not take more material than you think you will need.
16. Always wipe spatulas clean before and after inserting into reagent bottles.
17. Never return unused chemicals to the bottles. Always return chemical bottles to their proper place so others can use them.
18. Securely replace lids, caps, and stoppers after removing reagents from containers.
20. Never direct the open end of a test tube toward yourself or anyone else.
21. Learn the proper procedure for igniting and operating a laboratory burner. Always extinguish the flame when the burner is not being used. Make sure that all flammable reagents are well removed before lighting the burner.
22. Never place chemicals directly on the balance pan. Always use a proper weighing container when using a balance to weigh a chemical. Never pour chemicals directly over the balance.

Report any accident and/or injury, however minor, to your instructor immediately.

In the event of a serious medical emergency or fire, Call 911
It is in your own best interest to stay alert and to be aware of possible hazards in the laboratory. Do not hesitate to call unsafe practices by your colleagues to the attention of the instructors.

Failure to observe laboratory safety rules and procedures may result in injury to you or to fellow students. For a first violation, you may be asked to leave the laboratory for the day with a grade of zero for the lab. Repeated violations may lead to dismissal from the course, at the discretion of the instructor.

In the event of an Emergency
From a University Telephone dial Campus Police (Emergency Calls) at 911. They will contact whatever service is needed, be it fire, ambulance, or poison control. There is a campus emergency phone on the third floor hallway in CHBA.

Codes and Policies
The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with their instructors as early in the semester as possible. Students with disabilities must be registered with the Disability Resource Center prior to receiving accommodations in this course. The Disability Resource Center is located in Goddard Health Center, Suite 166, phone 405/325-3852 or TDD only 405/325-4173.

Each student should acquaint her or his self with the University's codes, policies, and procedures involving academic misconduct, grievances, sexual and ethnic harassment, and discrimination based on physical handicap.

Pregnancy/Childbirth Related Issues
Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact your instructor as soon as possible to discuss. Generally, modifications will be made where medically necessary and similar in scope to accommodations based on temporary disability. Please see www.ou.edu/eoo/faqs/pregnancy-faqs.html for commonly asked questions.

Title IX Resources
For any concerns regarding gender-based discrimination, sexual harassment, sexual misconduct, stalking, or intimate partner violence, the University offers a variety of resources, including advocates on-call 24.7, counseling services, mutual no contact orders, scheduling adjustments and disciplinary sanctions against the perpetrator. Please contact the Sexual Misconduct Office 405-325-2215 (8-5) or the Sexual Assault Response Team 405-615-0013 (24.7) to learn more or to report an incident.

Email communication: In order to aid communication, the University has established email as an acceptable means of official communication. All University students are assigned an official University email account and your instructor and/or the General Chemistry Coordinator will be communicating with you through this account periodically. Email sent to this account is expected to be read by you in a timely fashion. For convenience, you can arrange to have your email forwarded to another email account (go to https://www.office.com/ and set your mail Forwarding options); however, the University warns that you do so at your own risk. Failure to receive or read the communications sent to you via your official email account in a timely manner does not absolve you from knowing the information sent to you. Any correspondence with your instructor should include your name, section number, and the phrase “CHEM 1415” in the subject line.
**Academic misconduct:**
Cheating in any form will **NOT** be tolerated. This includes copying old lab reports, copying other students’ lab reports, plagiarizing (web content or other sources), and falsifying data. You and your partner are encouraged to discuss your answers and calculations with other students in the lab, or with your lab instructor. However, the report should be written in your own words and based on your own work. All prelabs and reports are to be submitted individually. Only the data collected during lab should be identical to your lab partner.

If you are caught cheating, the least that will happen to you is that your grade in laboratory will be lowered. You may also be failed in the course and suspended or expelled from the University. The small gains you might acquire by cheating are not worth the penalties if you are caught.

The instructor reserves the right to change any items contained in this syllabus. This includes, but is not limited to: course content, scheduled dates, and fraction(s) of final grade assigned to individual components of the course.

**Contact information relevant to CHEM 1415:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Function</th>
<th>Email</th>
<th>Office</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Clifford</td>
<td>Gen. Chem. Coordinator</td>
<td><a href="mailto:lclifford@ou.edu">lclifford@ou.edu</a></td>
<td>1570 SLSRC (MWF)</td>
<td>325-4383</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>119 CHBA (TR)</td>
<td>325-3316</td>
</tr>
<tr>
<td>Dr. Martyn</td>
<td>Instructional Lab Developer</td>
<td><a href="mailto:tmartyn@ou.edu">tmartyn@ou.edu</a></td>
<td>1565 SLSRC</td>
<td>325-3751</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>122 CHBA</td>
<td></td>
</tr>
<tr>
<td>Ms. Kim Moser</td>
<td>ILS Coordinator</td>
<td><a href="mailto:Kimberly.A.Moser-1@ou.edu">Kimberly.A.Moser-1@ou.edu</a></td>
<td>CHBA 116</td>
<td>325-2742</td>
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<td>Mr. Lance Goins</td>
<td>Dept. Advising Office</td>
<td><a href="mailto:ldg123@ou.edu">ldg123@ou.edu</a></td>
<td>CHBA 214</td>
<td>325-4121</td>
</tr>
</tbody>
</table>