CHEMISTRY 1415
Course Syllabus
Summer 2013

Jennifer Gray  jennifer-gray@ou.edu  Sec 275  MTWRF 10:30-12:30
Office Hours:  Daily after class, By appointment
Caio Franco  caio.franco-1@ou.edu  Sec 276  M-W 1:30-5:20
Office Hours:  By appointment
Jamie Sykes  jamie.r.sykes-1@ou.edu  Sec 277  M-W 1:30-5:20
Office Hours:  By appointment

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.


Online homework & Quizzes: Sapling Learning (www.saplinglearning.com)
Personal Response Device (clicker): Turning Technologies RF LCD Response Card (www.turningtechnologies.com)

Preparation for Lectures & Exams

The readings identified below are keyed to the current text and learning objectives for the course. You may choose to use any general chemistry textbook provided you are comfortable using the learning objectives below and your text’s table of contents. The order of the readings does not necessarily reflect the order of topics covered in lecture. Students may find that reading the textbook chapters in the order written by the textbook author to be more natural.

Extra credit homework problem sets (EC HW-) have been assigned to each unit of study and are due on the dates indicated on the course calendar at the end of this syllabus. These problems will be done via Sapling Learning, a computer based problem-solving program. Extra credit homework problem sets are minimum assignments representative of the question types you will be expected to be able to answer on examinations and quizzes. You should also attempt appropriate additional problems in your textbook as part of your preparation.

Learning Objectives, Reading Assignments, & Assigned Problems

1. Unit 1 - Kinetics - Chapter 14
   1.1. Express and compare rates of chemical reactions in terms of the concentration changes of the reactants and products (or factors proportional to concentration) per unit time. [Readings 14.1]
   1.2. Use collision theory to explain how chemical reactions occur and how rates are affected. [Readings 14.4]
   1.3. From experimental kinetics data, derive the rate law, order, and rate constant for a chemical reaction. [Readings 14.2]
   1.4. For a zero, first or second order reaction, determine the exact rate constant and half-life for a chemical reaction from time/concentration data. [Readings 14.3]
   1.5. From a reaction profile, determine ΔH & Ea for a chemical reaction. [Readings 14.4]
   1.6. Explain the role of catalysts, what they are, how they work, and how they affect a reaction profile. [Readings 14.6]
   1.7. From kinetic data, determine the relationship between Ea, k, and the temperature of both catalyzed and uncatalyzed chemical reactions. [Readings 14.4, 14.6]
   1.8. Determine the relationship between the rate law and the mechanism of a simple chemical reaction. [Readings 14.5]

2. Unit 2 - Equilibrium - Chapter 15
   2.1. Characterize chemical reactions in terms of reversibility and relative concentrations of reactants and products. [Readings 15.1]
   2.2. Determine equilibrium expressions for homogeneous and heterogeneous chemical reactions from stoichiometry. [Readings 15.2, 15.3]
   2.3. Determine the stoichiometric relationship between initial and equilibrium concentrations of reactants and products. [Readings 15.2]
2.4. Determine the relationship between $K_{\text{old}}$ and $K_{\text{new}}$ 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 15.3]

2.5. Determine the relationship between $K_C$ and $K_P$ for a chemical reaction involving gaseous components. [Readings 15.3]

2.6. Determine value for $K$ from equilibrium concentrations of reactants and products in a chemical reaction. [Reading 15.2]

2.7. Determine the equilibrium concentrations of reactants and products of a chemical reaction from initial concentrations and value of $K$. [Readings 15.4]

2.8. Determine if equilibrium has been reached in a chemical reaction; determine the direction the reaction will shift if equilibrium has not been reached. [Readings 15.4]

2.9. Use Le Châtelier’s Principle to predict the direction a reaction at equilibrium will shift as a result of changes in conc., pressure/volume, and temperature as it approaches a new equilibrium. [Readings 15.5]

**EXAM 1- Units 1 and 2 - Thursday, July 11 In-class**

3. **Unit 3 - Acid/Base - Chapter 16**

3.1. Relate $[H^+]$, $[\text{OH}]$, and $K_w$ in an aqueous solution. [Readings 16.2]

3.2. Determine the pH and/or pOH of an aqueous solution from the $[H^+]$ (or $[\text{OH}]$) and v.v. [Readings 16.3]

3.3. Define acids and bases in terms of Arrhenius, and Brönsted-Lowry theories. [Readings 16.1]

3.4. Recognize and construct conjugates of acids or bases. [Readings 16.1]

3.5. Determine the $[H^+]$, $[\text{OH}]$, pH and/or pOH of a strong acid or strong base solution. [Readings 16.4]

3.6. Determine and relate equilibrium concentrations, $[H^+]$, $[\text{OH}]$, pH and/or pOH with $K_w$ values for weak acids (also, same for $K_w$ values for weak bases). [Readings 16.5, 16.6]

3.7. Determine the $[H^+]$, $[\text{OH}]$, pH and/or pOH for weak acids or weak bases from initial concentrations. [Readings 16.5, 16.6]

3.8. Construct an ordered list of strongest to weakest (or v.v.) for acids or bases. [Readings 16.7]

3.9. Determine the $K_w$ for a weak base, given the $K_w$ value of its conjugate acid (v.v.). [Readings 16.7]

3.10. Determine the $[H^+]$, $[\text{OH}]$, pH and/or pOH of a salt solution. [Readings 16.10]

3.11. Qualitatively determine the acidic, basic, or neutral properties of a salt. [Readings 16.10]

3.12. Identify acids and bases using Lewis theory. [Readings 16.12]

3.13. Determine the $[H^+]$, $[\text{OH}]$, pH and/or pOH of weak and strong polyprotic acids. [Readings 16.8]

4. **Unit 4 - Aqueous Equilibrium - Chapter 17**

4.1. Define and make buffer solutions from (1) a weak acid and its conjugate base, (2) a weak base and its conjugate acid, (3) a weak acid and a strong base, and (4) a weak base and a strong acid. [Readings 17.1, 17.2]

4.2. Determine the pH of a buffer solution from concentrations and v.v. [Readings 17.1, 17.2]

4.3. Make a buffer with a specific pH. [Readings 17.2]

4.4. Determine the conjugate pair best suited to make a buffer of desired pH. [Readings 17.2]

4.5. Analyze a strong acid/strong base titration (including polyprotic) (determine end point location and entire pH curve, including pH at beginning, pH at end point, and pH at all other points). [Readings 17.3]

4.6. Analyze a titration of a weak acid or base with a strong base or acid (determine end point location and entire pH curve, including pH at beginning, pH at end point, and pH at all other points). [Readings 17.3]

4.7. Determine the $K_{\text{sp}}$ equilibrium expression for a partially soluble salt. [Readings 17.4]

4.8. Determine the $K_{\text{sp}}$ value, given the solubility of a salt (v.v.). [Readings 17.4]

4.9. Determine the effect of a common ion on the solubility of a partially soluble salt. [Readings 17.5]

**EXAM 2- Units 3 and 4 - Thursday, July 25, In-class**

5. **Unit 5 - Chemical Thermodynamics - Chapters 18 (& 5)**

5.1. Apply Hess’ Laws to thermodynamic quantities. [Readings 5.5]

5.2. Determine $\Delta H^\circ$ for a chemical reaction from $\Delta H^\circ$ values of reactants and products. [Readings 5.6]

5.3. Predict the qualitative change in enthalpy for various chemical reactions. [Readings 5.3]

5.4. Predict and compare the qualitative change in entropy for various chemical reactions and physical processes. [Readings 18.1, 18.2]

5.5. Determine $\Delta S^\circ$ for a chemical reaction from $S^\circ$ values of reactants and products. [Readings 18.3, 18.4]

5.6. Determine $\Delta G^\circ$ for a chemical reaction from the Gibbs equation. [Readings 18.5]

5.7. Determine $\Delta G^\circ$ for a chemical reaction from $\Delta G^\circ$ values of reactants and products. [Readings 18.5]

5.8. Determine $\Delta G$ for a chemical reaction from $\Delta G^\circ$ and the reaction quotient, Q. [Readings 18.6]

5.9. Predict whether a chemical reaction, as written, is spontaneous, non-spontaneous, or at equilibrium. [Readings 18.6]

5.10. Calculate the standard free energy for a chemical reaction from the equilibrium constant (v.v.). [Readings 18.6]
5.11. Determine the equilibrium temperature, $T_e$, for a chemical reaction from $\Delta H^\circ$ and $\Delta S^\circ$ (v.v.). [Readings 18.5]

### 6. Unit 6 - Electrochemistry - Chapters 19 (&4)

6.1. Assign oxidation numbers (oxidation states) to individual elements in a chemical compound or complex ion. [Readings 4.4]

6.2. Recognize redox reactions; distinguish from reactions not involving oxidation/reduction. [Readings 4.4, 19.1]

6.3. Stoichiometrically balance both half-reactions and cell reactions involving redox. [Readings 4.4, 19.1]

6.4. Draw a diagram of a voltaic (galvanic, spontaneous) cell and explain how it works, predicting changes which will occur during discharge. [Readings 19.2]

6.5. Define and identify anode, cathode, oxidation process, reduction process, oxidizing agent, and reducing agent for a redox reaction. [Readings 19.1, 19.2]

6.6. Calculate $E^\circ$ for a chemical reaction using a standard reduction potential table. [Readings 19.3]

6.7. Predict the products of a redox reaction. [Readings 19.3]

6.8. Calculate and relate values of $E^\circ$, $\Delta G^\circ$, and $K$ for an oxidation-reduction reaction. [Readings 19.4]

6.9. Calculate $E$ for a redox reaction under non-standard conditions of constituent concentrations and/or pressures. [Readings 19.5]

6.10. Draw a diagram of an electrolytic (non-spontaneous) cell and explain how it works, predicting changes which will occur during operation. [Readings 19.7]

6.11. Construct a line notation for an electrochemical cell from information concerning the anode, cathode, oxidation process, reduction process, oxidizing agent, and/or reducing agent (v.v.). [Readings 19.2]

6.12. Relate the amount of product(s) produced and/or reactant consumed in an electrolytic cell to the current used, time involved, and moles of electrons associated with the corresponding half-reaction. [Readings 19.7]

**EXAM 3- Units 5 and 6 - Tuesday, August 5 In-class**

**Unit 7 - Nuclear Chemistry - Chapter 20 (&2)**

7.1. Identify the number of protons and neutrons found in the nucleus of any atom. [Readings 2.3]

7.2. Identify the symbols representing various subatomic particles. [Readings 2.3, 20.1]

7.3. Using $N$ and $Z$ relationships for individual nuclides, predict stability/instability (non-radioactivity/radioactivity). [Readings 20.2]

7.4. Write balanced equations for nuclear reactions including decay, transmutation, fission, & fusion. [Readings 20.1, 20.4, 20.5, 20.6]

7.5. Identify missing nuclear particles in a nuclear reaction. [Readings 20.1]

7.6. Determine the half-life, beginning amount, final amount, or elapsed time in a radioactive decay reaction. [Readings 20.3]

7.7. Use radioactive (e.g. carbon-14) dating techniques to calculate the age of a substance. [Readings 20.3]

7.8. Determine the mass defect, binding energy, and binding energy per nucleon for a nuclear particle. [Readings 20.2]

7.9. Determine the energy absorbed or released in a nuclear reaction. [Readings 20.2]

**Unit 8 - Coordination Chemistry - Chapter 22 (&6)**

8.1. Determine the electronic configurations of transition metals and metal ions. [Readings 6.9]

8.2. Recognize and identify coordination compounds and their components. [Readings 22.1]

8.3. Determine oxidation number, coordination number, orbitals used in bonding, and geometry of the central metal in coordination compounds and complexes. [Readings 22.1]

8.4. Describe the bonding effects of polydentate ligands. [Readings 22.1]

8.5. Given their formulas, name coordination compounds and complexes (and v.v.). [Readings 22.1]

8.6. Recognize, describe, and identify structural isomers (coordination & linkage) and stereoisomers (geometrical and optical) of coordination complexes. [Readings 22.2]

8.7. Explain spin state and the magnetic and color properties of transition elements. [Readings 22.3]

8.8. Relate and predict electronic structure, field strength ($\Delta$), spin state, and magnetic and color properties of coordination complexes in octahedral, tetrahedral, and square planar environments. [Readings 22.3]

8.9. Relate and predict electronic structure, field strength ($\Delta$), spin state, and magnetic and color properties of coordination complexes based on ligand strength. [Readings 22.3]

**EXAM 4- Units 7 and 8 - Friday, August 16**

Make-up Exam – Up to 2 Units In-class
Examinations:

Exam organization: The course content in CHEM1415 is divided into eight units. Each unit on an examination will consist of ten multiple-choice questions, each question worth 5 points. The chapters of the text covered on each exam are listed by the reading assignments within each learning objective. One or more questions per examination may cover laboratory concepts, one or more questions may be based upon the extra credit homework problem sets, and one or more questions may reflect online quiz content.

Make up/Retake of Exams: Students who miss an exam or those who are dissatisfied with their performance have one opportunity to make up two unit exams. The higher of the two attempts, not the second attempt, is used in the final grade calculation. You will have this opportunity on the day of the last exam. You must specify which if any of the Unit exams you would like to make-up with that exam. You can make up only 2 unit exams.

Important exam information:

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 to the test.

No electronic devices: Electronic communication devices including but not limited to cellular phones, pagers, FM receivers, headphones, music devices of any sort, etc. are banned from examination rooms. Individuals for whom circumstances make the possession of such devices necessary must inform their laboratory instructor prior to an examination to make arrangements. Students found with an unauthorized communication device at an examination will be charged with academic misconduct, whether or not the device was in use at the time it was discovered.

Approved calculators only: Calculators with programmable functions and/or alphanumeric storage/recall capability (this includes graphing calculators) are not allowed for quizzes and examinations. You will be expected to use an approved calculator on all quizzes and examinations. If you have questions about your calculator, see me or your TA to ensure it is approved. Students using unauthorized calculators on exams may be charged with academic misconduct.

Exam location: Our exams will be during class, as indicated on the syllabus and class schedule. 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.

Laboratory:

Required materials:
• Turning Technologies RF LCD Response Card clicker (www.turningtechnologies.com) – also used in lecture & recitation
• Approved safety goggles: Must be purchased by the first day of lab

Lab check-in/check-out: Students will be assigned a 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. Students must check out of their laboratory locker 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 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.

Grading: Laboratory grades will be based on eleven reports worth 15 pts each. See the attached calendar (last page of syllabus) for a schedule of laboratory activities corresponding to your laboratory manual. Make-ups for laboratories will require an appropriate and verifiable excuse. See your laboratory instructor for appropriate make-up procedures.

Attendance in lab: Attendance in laboratory will be taken using the Turning Technologies LCD RF response card (clicker). Attendance will be recorded within the first ten minutes of the laboratory period. Students who are not present at the time attendance is recorded via clicker will be considered absent and will not be allowed to make up
the laboratory without a valid excuse (doctor’s note, University sponsored event, military duty, etc.). Students turning in lab reports for a laboratory period when they were absent will be charged with academic misconduct. Students must attend the laboratory check-out period at the end of the term or they will be assessed a $75 check-out fee. 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.

**Absences from lab due to illness:** If ill, a student must email their laboratory instructor prior to the start of the laboratory period regarding their absence due to illness or else a laboratory make-up will not be allowed. Only one laboratory per term may be made up due to illness without an accompanying doctor’s note. If a student has more than one absence over the term due to illness, a doctor’s note must be presented for each subsequent absence.

**Recitation:**
**Required materials:**

**Meeting:** Recitation meets after lab Monday-Wednesday.

**Grading:** Ten recitation grades will be recorded with the best eight out of the ten applied to the final grade calculation. Recitation grades will be based on group activities and computer laboratory activities performed in recitation. Your TA will provide further information related to recitation.

**Absences/Make-ups:** 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.

**Online quizzes (Sapling Learning):**
**Required materials:**
• Access through Sapling Learning (www.saplinglearning.com)

**Grading:** Online quiz scores will be assessed for each of the eight units covered. These quizzes are designed to help students prepare for the examinations and will be available through Sapling Learning [www.saplinglearning.com]. Quizzes are worth five points per unit and cover the content of the course learning objectives. Each online quiz question may be attempted up to 5 times. Online quiz scores will not count unless submitted by the deadlines (date and time) indicated on Sapling’s website. Since your computer and/or the net are not guaranteed to work at the last minute, we STRONGLY recommend that you not wait until the last minute to complete online quizzes. The Sapling Learning server time may differ from your clock, so submit your quiz well in advance of the due date time.

**Make-ups:** There are no make-ups for online quizzes since quizzes are posted well in advance of the due date/time for each unit.

**General notes on grading & grade discrepancies:**
**D2L:** Grades may be viewed on the D2L website for the course (learn.ou.edu). Please note that grades will not appear immediately on D2L as they will be intermittently updated during the term.

**Discrepancies:** Save all graded lab reports and any other documents returned to you for comparison with our records. In the event of a discrepancy, you will need to provide us with the original, graded lab or recitation assignment. Discrepancies in lab report grades or recitation assignments should be reconciled with your laboratory/recitation instructor. Discrepancies with exam grades should be resolved by bringing your student ID and your exam paper (blue/pink/tan/gold exam) to request a hand-grade of the scantron from the Undergraduate Program Assistant, Ms. Kristie Tevault (1000 SLSRC, 8 a.m. – 5 p.m.). Discrepancies in Sapling Learning quiz grades should be reported to Jennifer Gray.

**Extra Credit:** In addition to the course points assigned above, extra credit points are available for (1) in-class lecture activities and (2) the Sapling extra credit homework problem sets (designated as EC HW-#); and (3) extra credit evaluation for lab work. These extra credit homework problem sets are not to be confused with the online quizzes that are also available through Sapling. Deadlines for extra credit homework problem sets are available on the syllabus calendar and on saplinglearning.com.
In-Class (lecture) extra credit: Instructors will use Turning Technologies LCD RF response cards (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 Units 1 and 2, EC2 covers Units 3 and 4, EC3 covers Units 5 and 6, and EC4 covers Units 7 and 8. 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. 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.

Extra Credit: Lab Survey: You will be working with some new equipment this summer. In order to evaluate the labs with the new equipment, we will offer a 10 point extra credit survey at some time during the summer. Please participate in the Survey (and the extra credit.)

Sapling Learning Online Homework: Sapling Learning (www.saplinglearning.com) will be used for online homework in the course. A maximum of 32 points will be awarded through the homework extra credit, with a maximum of four points of extra credit awarded per Unit. Earning 80% of the points possible on the assignment yields the full 4 points of extra credit, 70-80% yields 3 points, 60-70% yields 2 points, and 50-60% yields 1 point. Earning less than 50% of the assignment points will not result in any extra credit points being awarded. Due dates for the online homework extra credit are variable – check the syllabus calendar (back page of syllabus). It is strongly advised that students work on problems as the topics are covered, avoiding the tendency to wait until the night before the assignment is due.

Policies & Notes

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 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.

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.

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://webapps.ou.edu/pass/); 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: 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 Norman Campus Academic Misconduct Code. Cheating of any kind will not be tolerated. Cheating is defined as an act performed so as to give a relative or unfair advantage to any person on an exam or assignment. Cheating 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.

**Class conduct:** Students are expected to be attentive during course and lab/discussion lectures and to remain seated until the end of the period. Disruptive behavior in lecture, laboratory, or recitation will not be tolerated.

**Laboratory and recitation will begin the first day of class.** You should bring paper, pen and pencil, lab or recitation manuals, and a 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.

**Last day to withdraw:** The final day to withdraw from the course is July 17, 2012. After this date, you must obtain the Dean’s permission to withdraw. Students who stop attending but who do not officially withdraw from the course will be assigned a final course grade.

**Table for grades**

<table>
<thead>
<tr>
<th>Unit Exam (50 ea.)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapters</td>
<td>14</td>
<td>15</td>
<td>4&amp;16</td>
<td>4&amp;17</td>
<td>18&amp;5</td>
<td>19&amp;4</td>
</tr>
<tr>
<td># of Questions</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Maximum pts</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Score</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Exam Make-up</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Best score</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

**Laboratory Grades**

<table>
<thead>
<tr>
<th>Lab</th>
<th>K-3</th>
<th>I-5</th>
<th>G-1</th>
<th>I-3</th>
<th>G-2</th>
<th>G-S</th>
<th>D-2</th>
<th>D-S</th>
<th>J-1</th>
<th>J-2</th>
<th>J-S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score (Max. 15 ea)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>Score (Max. 15 ea)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

**Recitation Quiz Grades**

<table>
<thead>
<tr>
<th>Quiz No. (Unit No.)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score (Max. 10 ea)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

**On-Line Quiz Grades**

<table>
<thead>
<tr>
<th>Quiz No. (Unit No.)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score (Max. 5 ea)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

**In-Class Clicker Grades**

<table>
<thead>
<tr>
<th>Grade Period Extra Credit</th>
<th>midterm</th>
<th>final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score (Max. 20 points total)</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

**On-Line Homework Grades**

<table>
<thead>
<tr>
<th>Unit No. Extra Credit</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score (Max. 3 ea)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>

**Final Grade Cut-Offs:**

<table>
<thead>
<tr>
<th>Maximum Pts Available</th>
<th>Final Letter Grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examinations 400</td>
<td>90% = A = 617</td>
</tr>
<tr>
<td>Recitation Quizzes 80</td>
<td>80% = B = 548</td>
</tr>
<tr>
<td>Laboratory 165</td>
<td>65% = C = 445</td>
</tr>
<tr>
<td>On-Line Quizzes 40</td>
<td>50% = D = 342</td>
</tr>
<tr>
<td>In-Class Clickers (20)</td>
<td>&lt;50% = F = &lt;342</td>
</tr>
</tbody>
</table>

1415 Syllabus
Do Not expect a curve given the extra credit potential.

More Policies & Notes

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 Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services 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.

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.

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 Norman Campus Academic Misconduct Code. You should understand that your instructor takes these matters seriously. Students who engage in academic misconduct should expect severe penalties. I will recommend an “F” in the course and expulsion from the University for all incidents (large and small) of academic misconduct.

Students are expected to be attentive during course and lab lectures and to remain seated until the end of the period. Disruptive behavior in lecture or laboratory will not be tolerated.

Laboratory will begin the first day of class. You should bring paper, pencil, and a calculator to lecture as well as your laboratory manual to laboratory. 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/discussion 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.

This is the second semester of a two-semester sequence; therefore, it is assumed that you are familiar with all the material presented in Chem 1315. If you did not receive a grade of “C” or better in Chem 1315, or did not pass the Chem 1315 placement exam, you should repeat Chem 1315 before attempting Chem 1415.

The final day to withdraw from the course is Wednesday, July 25. Students who stop attending but who do not officially withdraw from the course will be assigned a final course grade.

Who to See / Where to Go

<table>
<thead>
<tr>
<th>Name</th>
<th>Function</th>
<th>Location</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jennifer Gray</td>
<td>Instructor</td>
<td>PHSC 303</td>
<td>Daily after Class and By appointment</td>
</tr>
<tr>
<td>Chemistry Office</td>
<td>Gen Chem Sec.</td>
<td>SLSRC 1000</td>
<td>M-F 9:00 -11:30 am</td>
</tr>
<tr>
<td>Moser</td>
<td>Lab Coordinator</td>
<td>CHBA 116</td>
<td>M-F 8:00-5:00 or as posted</td>
</tr>
<tr>
<td>University Action Tutoring</td>
<td>Help</td>
<td>(<a href="http://uc.ou.edu/action.htm">http://uc.ou.edu/action.htm</a>)</td>
<td>[not avail. in summer]</td>
</tr>
</tbody>
</table>
Need Additional Help?

Besides normal class attendance in the lecture and laboratory, students have several opportunities available to enhance their level of learning in the course. Some of these items are suggested below.

**University College’s Action Tutoring:** The University College’s Action Tutoring is another source of possible help to all CHEM 1415 students. This UC’s Action Tutoring will be available on a drop-in basis during evening hours at a location and times to be announced. To view the location and schedule, go to http://uc.ou.edu/action.htm. University College Action Tutoring begins the second week of class.

**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 CHEM 1415 at learn.ou.edu. The CHEM 1415 instructors may make lecture notes available on the course website (download and print with Adobe® Reader). Check with your lecture instructor about this. If you are printing out the lecture notes at a computer lab, please be certain to print to the correct printer. In the past, course notes have ended up being printed out all over campus.

**Office Hours:** If you need an office hour with your TA, please notify and make arrangements with your TA.

**Tutoring list:** The Undergraduate Program Assistant in the Department of Chemistry & Biochemistry office, Ms. Kristie Tevault (ktevault@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. 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 an exceptional help to many students. Such independent study groups are, thus, also encouraged.

**Previous Exams:** Copies of recent exams are available online at the course website at https://learn.ou.edu. Students should try to answer the questions on past examinations under testing conditions – i.e., without access to any book, notes, another student, or instructor. Students should be aware that past exams were not necessarily written by the current instructors and may be based on a different textbook from the one being used this semester. However, for the most part the topics will be comparable to the current syllabus. Please note that old exams are posted without corrections.

**Homework:** Extra credit homework problem sets are available through Sapling. You will have multiple attempts at each question. Extra credit points will be available to students who correctly complete homework problem sets. 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. Worked out answers for these problems are available in the solutions manual on reserve in the Main Library (ask for the CHEM 1415 Solution Manual). These solutions should only be examined after working/attempting the problem.

**Computer lab resources:** The University has computer laboratories at six locations: 232 PHSC, Dale Hall Tower, Walker Tower, Couch Tower, Bizzell Memorial Library, and the Oklahoma Memorial Union. These facilities are open for student use seven days a week at hours posted in each lab. Both IBM and Macintosh computers are available.

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>Ms. Kristie Tevault</td>
<td>Undergrad. Program Assist.</td>
<td><a href="mailto:ktevault@ou.edu">ktevault@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>
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. Please fill in the blanks that follow in order for you to have the correct information about your laboratory section. A directory of teaching assistants and other personnel will be posted outside of CHBA 116 and at enroll.ou.edu

Laboratory Instructor_________________________________________Lab/Office Room #___________

TA Code__________ Section #__________ Office Hours ________________Office Phone ___________

Materials to be purchased for laboratory:
(2) During class inventions and computer lab activities Vol 1. 3rd edition, by Abraham, Gelder & Greenbowe, Hayden-McNeil, 2009
(3) Model kit: Foundation Set for General and Organic Chemistry (in 1415 course package)
(4) Approved safety goggles

<table>
<thead>
<tr>
<th>Summer 2013</th>
<th>Laboratory Experiments – CHEM 1415 (Section 346&amp;347)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday</td>
<td>July 9 Check-in – no experiment</td>
</tr>
<tr>
<td>Wednesday</td>
<td>July 10 K-3 Bromination of Acetone</td>
</tr>
<tr>
<td>Thursday</td>
<td>July 11 I-5 Iron(III) Nitrate &amp; Potassium Thiocyanate</td>
</tr>
<tr>
<td>Monday</td>
<td>July 15 No Lab (Review for Exam)</td>
</tr>
<tr>
<td>Tuesday</td>
<td>July 16 G-1 Acid &amp; Base Classifications</td>
</tr>
<tr>
<td>Wednesday</td>
<td>July 17 I-3 Acetic Acid</td>
</tr>
<tr>
<td>Thursday</td>
<td>July 18 G-2 Acid &amp; Base Interactions</td>
</tr>
<tr>
<td>Monday</td>
<td>July 22 Computer Lab – Acid/Base Classification</td>
</tr>
<tr>
<td>Tuesday</td>
<td>July 23 No Lab (Review for Exam)</td>
</tr>
<tr>
<td>Wednesday</td>
<td>July 24 D-2 Potassium Hydroxide &amp; Hydrochloric Acid</td>
</tr>
<tr>
<td>Thursday</td>
<td>July 25 D-S Heat Laws Systems</td>
</tr>
<tr>
<td>Monday</td>
<td>July 29 J-1 Oxidation-Reduction Reactions/Voltaic Cells</td>
</tr>
<tr>
<td>Tuesday</td>
<td>July 30 J-2 Electrolysis Reactions</td>
</tr>
<tr>
<td>Wednesday</td>
<td>July 31 Computer Lab – Electrochemistry/Concentration of Cells</td>
</tr>
<tr>
<td>Thursday</td>
<td>August 1 Check-out ($75 penalty if missed!) Review for Exam</td>
</tr>
</tbody>
</table>
Check-in and Breakage Policy

The first laboratory period is designated as check-in. At this time you will be issued a stocked equipment drawer. Check all the equipment in your drawer with the list provided by your TA. All missing, broken, or damaged items should be replaced by the stockroom at this time. When you visit the stockroom please take the time to make a list of needed items to avoid numerous trips. Any equipment that cannot be replaced will be listed as a "check-in shortage" on your record card. During the semester, any equipment that you break or damage will be recorded on the record card. You will be held financially responsible for all equipment issued to you. If this equipment is lost or damaged, the cost of replacement or repair will be billed to you 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 expendable 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 of lab should occur when you withdraw from the course or during the final laboratory period. Failure to check-out will result in a penalty fee of $75.00 for cleaning and inspecting your equipment. This fee will be billed to you through the Bursar’s office.

Attendance, Late Labs, Makeups

Lab periods are three hours long. Please utilize this time wisely: planning your experiments, collecting data, writing reports. If you elect to leave lab early, your lab report will be due at that time. Otherwise, all lab reports will be due at the end of the scheduled laboratory period, unless your laboratory instructor indicates another due date for some unusual or mitigating circumstance.

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 points up to a 2 lab meetings late. Reports more than 2 lab meetings late will not be accepted.

Please be prepared to provide documentation for missing a laboratory period. You will only be able to make up one lab for a legitimate reason. The make-up lab date is a computer activity. If you miss a lab period for a legitimate reason, contact your TA as soon as possible.

Codes and Policies

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.

Cheating in any form will NOT be tolerated. This includes copying old lab reports, copying other students’ lab reports, 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. You are responsible for all portions of the report written/done by your lab partner(s). If they plagiarize and/or cheat, you are as guilty as they are.

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.

Laboratory Grades

Your laboratory grade will depend on the laboratory reports that you and your partner submit. Your laboratory
instructor will grade these reports using specific criteria including:

1. Was the report submitted on time?
2. Did both students fully attend the laboratory session?
3. Does the work presented reflect the allotted time?
4. Is all the work of the lab exercise attempted?
5. Does the data reasonably reflect good laboratory technique?
6. Do the explanations and conclusions represent a good quantitative understanding of the laboratory exercise?
7. Are the conclusions logically related to the data collected by the students?
8. Was there visible contribution by both students in both collection and interpretation?

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

**Laboratory Reports**

In the laboratory you will work in pairs, except on certain exercises. The partnership is expected to complete and turn in one laboratory report for which the partners will receive the same grade. Both partners are expected to contribute to the report. 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 or require the student to work alone. The laboratory instructor will reassign partnerships at his/her discretion or at a student request. Students are free to work alone if they so desire.
2. 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 period and will not be allowed to use his/her partner's data.
3. No more than two students may constitute a partnership except by permission of the instructor.
4. Students are required to finish and submit laboratory reports during the period of the laboratory activity.
5. Students who are unable to submit laboratory reports at the end of the laboratory period should be prepared to submit a copy of their collected data to the instructor in charge before leaving. Unless otherwise indicated, reports are due at the end of the laboratory.
6. Partners should submit reports and make conclusions based on their data collected by them, arrived at independently of other groups, and stated in their own words. Any evidence of falsifying data, or copying conclusions from other students (present or past) will be used in academic dishonesty proceedings against the students involved.
7. Both partners are expected to contribute to the collection and interpretation of data and to the construction of the laboratory report. Students who do not do their part may be assigned a new partner or be asked to do their laboratory work independently.

**Reasonable Accommodation Policy**

Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact their lab instructor personally as soon as possible so they can discuss accommodations necessary to ensure full participation and facilitate their educational opportunities.

**Safety**

Your lab instructor will point out all the safety features of your lab during check-in. These include exits, fire extinguishers, safety showers, and eye washes. Other safety rules will be explained at that time.

The State of Oklahoma requires you to wear safety goggles in the laboratory at all times. Suitable goggles will be sold during the first week of school in your lab. (Other outlets also sell goggles. Make sure they meet state safety standards for laboratory use before purchase.) Your TA will expect you to wear your goggles OVER YOUR EYES at all times. Repeated disregard to this safety rule is grounds for your dismissal from lab.

Part of safety is good laboratory technique and good housekeeping habits. Your laboratory instructor will teach you laboratory techniques related to the exercises you are performing during the semester. You should also read about the techniques described in the appendices of your laboratory manual. You are responsible for
seeing that your laboratory station is kept clean and neat. Store books, backpacks, and personal items in the cubicles provided in the laboratory. Make sure gas jets and water taps are off when not used, and that waste is disposed of properly. Make sure that insoluble materials, paper, and broken glass is kept out of the sinks.

**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.

1. Approved safety goggles are to be worn by everyone in the laboratory whenever anyone is working. **This is a State Law.**
2. All personal belongings (books, bags, purses, coats) should be stored in cubby holes.
3. Shoes are to be worn at all times in the laboratory. Sandals are not allowed.
4. Smoking is forbidden in the laboratory.
5. Eating or drinking in the laboratory is forbidden.
6. Always obtain the instructor’s permission before carrying out any experiment which is not in the lab manual.
7. Students may not work in laboratories unattended. If make-up work is to be done, it must be carried out under supervision.
8. Never pour water into concentrated acids. Always pour acid slowly into water while constantly stirring.
9. Never taste a chemical unless specifically instructed to do so. If you are instructed to smell a chemical, gently fanning the vapors toward your face. Never smell a chemical by putting your nose over the container.
10. 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.
11. Never return unused chemicals to the bottles. Always return chemical bottles to their proper place so others can use them.
12. Always clean off your desk top thoroughly at the end of the period. Make certain that all gas outlets and water faucets are turned off before you leave the laboratory.
13. Spilled chemicals, broken glassware, etc. should be cleaned up carefully and without delay.
14. The floor should be kept free of obstructions or slipping hazards (e.g., spilled ice, pencils, etc.).
15. Insoluble materials (paper, glass, cmpds, etc.) falling into a sink or drain should be removed immediately.
16. Under all circumstances, appropriate chemical disposal should be followed. Ask the instructor for specific information.
17. Never fill a pipet by mouth suction.
18. Before removing a chemical from a bottle, read the label carefully.
19. Acts of carelessness or mischief are forbidden. Chemicals and equipment may be handled only in prescribed ways and for prescribed purposes. Such "playful" activities as pushing and shoving, wrestling, chasing, and threatening people with any chemical or piece of equipment are not tolerated.
20. Gloves, rubber aprons, or other protective clothing should be worn when appropriate.

**Normal penalty for violation of these rules is prompt dismissal from the class with no privilege of making-up work.**

From a University Telephone dial:

- Ambulance 911
- Campus Police (Emergency Calls) 911
- Fire Department 8-321-3131

Poison Control Center (OKC, 8-271-5454)
Norman Regional Hospital 8-321-1700