Syllabus – Chemistry 100, Chemical Science (Lec 401), Fall 2017

Instructor: Dr. Christine Carlson
Office: CHM 143
Office Hours: MW: 11:00am – 12:00pm; TR: 4:00 – 5:00pm
Email: cac4@uwm.edu

The syllabus is subject to change. Only the most current version of this syllabus is valid. If the syllabus is changed after the start of classes, one verbal announcement will be made in lecture and the new version will be uploaded to D2L with the version date in the file name.

All emails correctly addressed will be answered within two business days. To ensure that your email is correctly addressed you must include your Course number and lecture number in the subject line, ex: Chem 100 – 401. In addition, the email must be sent from your UWM email account.

Overview of the course

Introductory course in general inorganic chemistry designed for the student with little or no previous science training. 3 hrs lec, 1 hr dis.

Prerequisites

Not open for cr to students who have cr in Chem 102. Prereq: a math placement score of 30 or a grade of C or better in Math 105(P) or 108(P).

Dropping the Course, Changing Sections, Incompletes

All drops, adds, and section changes of Chemistry Department courses should first be attempted using PAWS. Any changes to your schedule that cannot be done using PAWS will require the stamp of the Chemistry Department. This may also require my signature. A discussion or laboratory TA can never sign an add/drop form.

An incomplete can be given only for a student who has been doing satisfactory work, but is unable to complete the course for a reason which I judge to be valid, and must be accompanied by appropriate documentation.

Important dates

You will be responsible for knowing the deadlines for drops or withdrawals as determined by the University. This includes the final day to withdraw from any class for academic reasons.

Last date to ADD/SWAP – September 18th 2017. I do not allow ADDS or SWAPS after this date.

Last date to DROP without a W – October 2nd 2017

Last date to DROP a course – October 27th 2017 - After this day, I will not sign any withdrawals from the course for academic reasons.
Required Materials


**Homework System – ALEKS 360:** This is the homework system for this course. Access to this system comes with your ebook (if purchasing the ISBN number above). If a student choose to not purchase the approved course materials (ISBN number above) then the student will need to purchase access to the homework system separately.

**Classroom Response System:** You will use your own electronic device to enter answers into a classroom response system. To do this, you will need to register on Tophat.com (registration information on page 8). Expected cost is $18 or less.

**Chemistry 100 – Lecture Exercises** – available by the start of classes at Clark Graphics, 2915 North Oakland – expected cost approximately $25. Ensure that you purchase the book for this lecture.

**Calculator:** Non-graphing or non-programmable scientific calculator with logarithms, exponential functions, etc. – expected cost approximately $20.

Graphing calculators, cell phone calculators, laptops, pda's, etc. are strictly forbidden in exams or quizzes. You may only use a NON-PROGRAMMABLE, scientific calculator for exams or quizzes. If you attempt to use something else which is prohibited you will be required to work with pencil and paper only.

Lecture **Chemistry 190** MWF 9:00am – 9:50am

The number of points you receive for attending lecture will be minimal. Part of the learning process involves thinking about what is being said in lecture, writing it down, and even re-writing it to clarify what you have heard.

You are expected to read your textbook before coming to class and once again after lecture. It is very helpful to test yourself on your knowledge development. Using the quiz or exam as a means to test if you have learned something could be too late to determine you still have a gap in knowledge.

**Homework, Lecture Questions (classroom responses) and Lecture Quizzes**

Homework will be assigned and graded using the ALEKS 360 system. More information will be given about this at the start of the semester giving specifics concerning deadlines and procedures for registering. Graded homework from ALEKS will contribute to your homework total. Homework from the textbook (all red-numbered problems) are also assumed to be completed but will not be collected or graded. Not completing your homework will reduce your points and will affect your grade.
Lecture Questions – TopHat will be used for a small number of lecture questions (approximately 2 questions per lecture). The lecture question provide for both attendance and an evaluation of how well students are keeping up with the material. The procedure for registering for this will be discussed on the first day of lecture and given on D2L. The percentage of your TopHat participation (NOT correctness) throughout the semester will determine your lecture question total. **Students who participate in at least 80% of the questions will receive 100% of the points.** Participating in less than 80% of the questions will reduce your Lecture Question Total and will affect your grade.

Lecture quizzes will be given every week of class except the first week of the semester or thanksgiving week (therefore 13 quizzes will be given). The lecture quizzes will be given in the last 20 minutes of Friday lectures. **Your highest 10 quizzes will count towards your quiz total** (with the three lowest being dropped, excused absences are not accepted). The only exceptions to this are verified military activities, verified student disability (ARC VISA verification), religious observance verification (following university policy). Quizzes may include extra credit. Quiz solutions will be posted on D2L.

**Missing a quiz for any reason results in that quiz counting as one of your drops – do not request to take a quiz at any other time since everyone can drop two quizzes.**

Discussion

**You are required to attend your discussion section** (the discussion section for which you have registered) for this reason 2 or the 10 possible points earned in discussion each week will be given for being present on time. Your attendance and participation in discussion sections is essential because your final grade depends critically on your ability to solve problems.

You will have an opportunity to work some problems from the “Lecture exercises” in discussion collectively. In order to have a positive experience in discussion, it is to your benefit to both prepare for discussion and participate. You will be required to complete supplemental problems in discussion and submit these at the conclusion of each discussion section. Discussion points will be earned in all discussions except for the first week, thanksgiving week, or the last week of the semester (leaving 12 discussions that earn points). **Your highest 10 discussion grades will count towards your discussion total** (with the two lowest being dropped, excused absences are not accepted). The only exceptions to this are verified military activities, verified student disability (ARC VISA verification), religious observance verification (following university policy). **Missing discussion (beyond two that earn points) will reduce your points and will affect your grade.**

Examinations

Four hourly exams are scheduled by the university throughout the semester on Monday evenings (5:30-7:00 pm per the schedule of classes) as shown in the table below. Please note that the location for these examinations is different from the location for the lecture. **Although the time period is 1 hr and 30 minutes. I, as the instructor decide how much time to give for an examination.**

The final Examination is on Wednesday December 20th from 7:30am – 9:30am as noted in the table on the next page. This is in accordance with the University Final Exam Schedule (http://uwm.edu/onestop/enrolling/finding-classes/final-exam-schedule/).
<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
<th>Start Time</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hour Exam #1</td>
<td>Mon 09/25/17</td>
<td>5:30 pm</td>
<td>LAP 162</td>
</tr>
<tr>
<td>Hour Exam #2</td>
<td>Mon 10/23/17</td>
<td>5:30 pm</td>
<td>LAP 162</td>
</tr>
<tr>
<td>Hour Exam #3</td>
<td>Mon 11/20/17</td>
<td>5:30 pm</td>
<td>LAP 162</td>
</tr>
<tr>
<td>Hour Exam #4</td>
<td>Mon 12/11/17</td>
<td>5:30 pm</td>
<td>LAP 162</td>
</tr>
<tr>
<td>Final Examination</td>
<td>Wed 12/20/2017</td>
<td>7:30am – 9:30pm</td>
<td>TBD</td>
</tr>
</tbody>
</table>

Your graded hour exams (Hour Exam #1, #2, and #3) will be returned in the next regularly scheduled discussion section.

If you believe that your exam has been unfairly graded you must return the exam to your TA before the end of the discussion section. He/she will get the exam to me and I will re-grade it completely. You should be aware that if you elect to do this, your grade may be higher, the same, or lower, depending on whether or not other problems may have been graded too generously.

You will be allowed to drop your lowest hour exam (#1 - #4) score. There will be no early exams, no late exams, and no make-up exams (excused absences are not accepted). The only exceptions to this are verified military activities, verified student disability (ARC VISA verification), religious observance verification (following university policy). The final exam is mandatory (cannot be dropped).

If you have problems with an employer, travel plans, reservations, athletic or music trips, etc. work them out at an early date. Take this syllabus to your employer if necessary. This is not designed to be punitive. With many students, logistics make this policy necessary.

**Two standardized final examinations will be used in this course.**

In order to be eligible to pass the course, you must score in the 35th percentile or higher on both of the standardized final examinations.

If you do not take BOTH of the final exams, you cannot pass the course.

**Supplemental Instruction (Chemistry Department)**

The Chemistry department has started to offer supplemental instruction. This is open to all students in the class, however if you are at risk due to attendance, homework scores, quiz scores or exam scores you will be personally encouraged to attend the supplemental instruction offered. Attendance at supplemental instruction sessions will earn students extra credit points.

**Academic Dishonesty**

Cheating on an examination, quiz or other graded material (including labs) will result in a grade of zero as a minimum consequence. Failure in the course and referral to the Dean may also occur. Academic dishonesty or misconduct in any form will not be tolerated. This includes the use of unauthorized materials during a quiz or exam – such as graphing calculators, phones, smart watches, etc.
Grading

Your final grade in the course is determined by adding up the total points earned from the following grade categories: Hourly Exam total, Final Exam score, quiz total, homework total, lecture question total, discussion total and any extra credit earned. The total of these grade categories is divided 900 (the total number of points for the course). Your percentage is then compared to the grade table on the next page. Students are only given the grade that they have earned in the course.

The total number of points for the class is 900. A general breakdown by letter grade is shown but may be altered as needed. Breakdown of the 900 points is as follows:

<table>
<thead>
<tr>
<th>Grade category</th>
<th>Points</th>
<th>Percentage</th>
<th>Letter grade</th>
<th>Percentage</th>
<th>Letter grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hour Exams</td>
<td>300</td>
<td>92.5-100</td>
<td>A</td>
<td>72.5-76.4</td>
<td>C</td>
</tr>
<tr>
<td>Final examination</td>
<td>200</td>
<td>89.5-92.4</td>
<td>A-</td>
<td>69.5-72.4</td>
<td>C-</td>
</tr>
<tr>
<td>Quiz Total</td>
<td>100</td>
<td>86.5-89.4</td>
<td>B+</td>
<td>66.5-69.4</td>
<td>D+</td>
</tr>
<tr>
<td>Discussion Total</td>
<td>100</td>
<td>82.5-86.4</td>
<td>B</td>
<td>62.5-66.4</td>
<td>D</td>
</tr>
<tr>
<td>Homework Total</td>
<td>100</td>
<td>79.5-82.4</td>
<td>B-</td>
<td>59.5-62.4</td>
<td>D-</td>
</tr>
<tr>
<td>Lecture Questions Total</td>
<td>100</td>
<td>76.5-79.4</td>
<td>C+</td>
<td>Below 59.5</td>
<td>F</td>
</tr>
<tr>
<td>Total</td>
<td>900</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Exams: Each one-hour exam is worth 100 points; for a total of 300 (dropping the lowest score). Hourly Exam Total.

Final Exam: The two cumulative final exams are worth 200 points towards your final grade. Two final exam booklets will be used and in order to be eligible to pass the course. You must score a 35% or higher on the final examination in order to be eligible to pass this course.

Quizzes: Each quiz will be worth 10 Quiz points and some may include extra credit. The 10 highest quiz grades (3 lowest dropped) will be normalized to a total of 100 course points towards your Quiz total.

Discussion: Discussion sections points will be accumulated from attending discussion and completing the supplemental problems. Each discussion will be worth 10 discussion points. The 10 highest discussion grades (2 lowest dropped) will be normalized to a total of 100 course points towards your Discussion total.

Homework: Online homework will be assigned via ALEKS 360. Your homework grade is comprised of two parts: Objective scores (50%) and your overall pie completion (50%) at the end of the semester. Your ALEKS grades (objectives and overall pie) will be normalized to 100 course points towards your Homework total.

Lecture Questions: The percentage of your participation with TopHat to answer lecture questions will contribute a normalized total of 100 points to your Lecture Questions total.
Department of Chemistry Policies
Departmental policies regulating the conduct of this course can be found in the main office of the Chemistry Building (CHM 144). University policies can be found at http://www.uwm.edu/Dept/SecU/SyllabusLinks.pdf

Select University Policies: Below are links to a few select University policies

Accommodation of Religious Beliefs: https://www4.uwm.edu/secu/docs/other/S1.5.htm

Final Exam Policy: http://www4.uwm.edu/secu/docs/other/S22.htm

Register’s Office Policies: http://uwm.edu/registrar/students/enrollment-policies/

Active Duty Policy: http://www4.uwm.edu/academics/military.cfm

Lecture Questions - Registering for TopHat
You will be using your own device to give electronic responses into the classroom response system. These devices can be cellphones, laptop computers or tablets. You have the option of downloading an app onto your smartphone. You must also register to do this. To register, you need this information:

1. The 6-digit course code: 565622
2. The password: fall2017chem100401

Create an Account
1. Go to https://app.tophat.com/e/565622 to access the class directly (preferred) or to tophat.com.
2. Click on student sign up.
3. Select school “UWM” or enter “565622” under the 6-digit course code.
4. Enter your account details including your UWM ID number and your First and Last name as listed in D2L.
5. Enter your cell phone number if you wish to text your response (only to be used to link to your TopHat account).
6. If you enter your cell number you will receive a text with a code to enter.

Enroll in this Class
1. Select this course to enroll, “Chem 100-401 Fall 2017”. You will also need to enter the password “fall2017chem100401”.
2. At this point, you will need to register/purchase your registration code.
3. Payment information will be requested at this point. Select your code choice (either 1 semester or 5-year code). The costs are:
   1-semester code = $15 or 5-year code = $35
4. Through the check-out process the discount will be applied (you may first see a higher cost for a code but as you check out, the cost will be discounted to the rates above). In the event you would like to upgrade from a 1-semester code to a 5-year code, this can be done by calling Tophat at any time before your 1-semester code expires. You will then only pay the difference in the costs.
5. There is documentation under the TopHat section of the D2L Content page to guide you through this process.
To use TopHat in class Remember to bring your device to each and every lecture

You will be prompted to answer a question or a series of questions.
1. Wait until the question is active
2. Using the mobile app, enter your answer.
3. Using text function, enter your answer by texting to the text number shown on the question.
4. Using a laptop or internet access, go to tophat.com, login and enter your answer.

You can enter answers more than once. Only the answer entered last will be counted. You will receive confirmation that your answer was received.

If you have any difficulties with Tophat, please contact 315-636-0905

Homework - Registering for ALEKS

You homework will be completed using ALEKS. A code was included with your ebook purchase through the bookstore. You can also purchase a code separately.

Do I need to purchase access? What does it cost?  
Yes. You can purchase an access card at the bookstore. You can also purchase directly through ALEKS at www.aleks.com.

If you cannot purchase ALEKS right away, you can use the temporary access code (see step 5) that will allow you to work up to 2 weeks, then you will be prompted to pay in order to continue (there is no excuse to not complete homework assignments).

There is documentation on D2L (ALEKS section of the content page: UWM ALEKS Chem Quick Start-up Guide)

How do I log-in?  
1) Go to www.aleks.com  
2) Click on SIGN UP NOW!  
3) Enter Course Code: C6VXF-9EJ4V  
4) Confirm you're in the right course – Chem 100 401 Fall 2017. Credit will not be given for not being in the correct course.  
5) You will now be prompted to enter your access code. It is also at this step you can purchase access online. If you would like to begin working in ALEKS, but cannot purchase right now, feel free to use this temporary access code good for two weeks: 0D9C3-38015-09FD5-91883  
6) Fill out the student information webpage – The name that you enter MUST match your name as it appears in D2L.

To Do Items

1) Complete the ALEKS Initial Knowledge Check by 9/10 at the latest – You cannot start working on objectives until you complete this task.
   • You will be asked to solve about 20-30 problems (this will take you anywhere from 30 to 90 minutes – at any time you can logout and log back on, it will keep your place).
   • You'll get no help at all, nor should you try to find any. The idea is to find out where you should start learning, and you want ALEKS to get that just right. If you get your friend the chem grad
student to help you, or do a lot of googling, you'll just end up with learning that is **way too hard and frustrating**, because you'll be missing important pre-requisites. **If you don't take the Knowledge Check seriously, you'll just end up wasting time on material you already know.**

- The Knowledge Check is over the entire first-year material, so you can expect to get problems you have no idea how to solve. Don’t worry about that. This is a placement test, not a final exam. You’re not going to be graded on it, and there’s no reward for doing better or penalty for doing worse.

2) Learning Mode

- After the Knowledge Check, you will see your ALEKS “pie.” This shows you what you already know, what you’re ready to learn, and what topics you’ll eventually need to learn, and by what dates.

- After clicking “Next” at the bottom of the page, you can begin working on topics by clicking “Continue My Path”.

**Tentative Class Schedule (subject to change):**

<table>
<thead>
<tr>
<th>Week of</th>
<th>Lecture Topics</th>
<th>Exams / Quizzes / ALEKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept 4th</td>
<td>Syllabus; Overview of the course and keys for success – Introduction to Chemistry</td>
<td>ALEKS – initial knowledge check 9/10</td>
</tr>
<tr>
<td>Sept 11th</td>
<td>Introduction to chemistry Atomic Theory</td>
<td>Quiz 1 – Friday (9/15) ALEKS OBJ 1 Due 9/17</td>
</tr>
<tr>
<td>Sept 18th</td>
<td>Atomic Theory continued Electronic Theory</td>
<td>Quiz 2 – Friday (9/22) ALEKS OBJ 2 Due 9/24</td>
</tr>
<tr>
<td>Sept 25th</td>
<td>Electronic Theory continued Start Covalent Bonding</td>
<td>Quiz 3 – Friday (9/29) ALEKS OBJ 3 Due 10/1 Exam 1 – Monday (9/25)</td>
</tr>
<tr>
<td>Oct 2nd</td>
<td>Covalent Bonding continued</td>
<td>Quiz 4 – Friday (10/6) ALEKS OBJ 4 Due 10/8</td>
</tr>
<tr>
<td>Oct 9th</td>
<td>Intermolecular Forces Ionic Bonding</td>
<td>Quiz 5 – Friday (10/13) ALEKS OBJ 5 Due 10/15</td>
</tr>
<tr>
<td>Oct 16th</td>
<td>Periodic Trends Nomenclature</td>
<td>Quiz 6 – Friday (10/20) ALEKS OBJ 6 Due 10/22</td>
</tr>
<tr>
<td>Oct 23rd</td>
<td>Unit Conversions The Mole</td>
<td>Quiz 7 – Friday (10/27) ALEKS OBJ 7 Due 10/29 ALEKS – Mid Term Knowledge Check Exam 2 – Monday (10/23)</td>
</tr>
<tr>
<td>Oct 30th</td>
<td>Formula Calculations Empirical Formulas</td>
<td>Quiz 8 – Friday (11/3) ALEKS OBJ 8 Due 11/5</td>
</tr>
</tbody>
</table>
Learning Objectives

GER outcomes: GER courses provide “students with a broad body of knowledge” (UWM Fac. Doc. 1382, p. 2, II, par 1). This course carries the GER natural sciences distribution designation because it prepares students to achieve the following three learning outcomes. Upon successful completion of this course, you should be able to:

1. Understand and apply the major concepts of a natural science discipline, providing insights into its breadth and its relationship to other disciplines;
2. Explain and illustrate the relationships between experiments, models, theories and laws; and,
3. Demonstrate an understanding of the process of generating and testing of data, and apply this knowledge to the solution of problems.

Course-specific objectives: In order to set the GER outcomes within the framework of this course, a set of objectives have been designed to give you a better understanding of what you are expected to learn over the course of the semester, and some indication of how it will be measured as to what degree this has occurred. These will be incorporated through all types of assessments but will be formally measured on the weekly quizzes and hourly exams. In order to prepare for this, certain objectives will be presented each week in discussion with exercises for practice.

The examples of how these may be measured are examples ONLY and should not be interpreted as an inclusive ‘checklist’.

Objective 1: Understand spatial scale, particularly to the very sizes (on the order of atoms).
As an example you should be able to: estimate measurement, conceptualize relative sizes, use measurement tools skillfully, correctly compare numbers, convert measurements and scales, be able to compare specific objects (atoms and molecules, for example) by size and use the atom as a starting point in representing matter and changes.

Objective 2: Understand the language of chemistry including naming simple compounds.
As an example you should be able to: properly define important key terms, give a name for a chemical formula of a simple compound, give the chemical formula for a name, give the charges and names for the monoatomic and polyatomic ions of interest (these will be specified).

Objective 3: Understand the relationship between macroscopic, particle and symbolic representations of matter including atom relationships in molecules and compounds.
As an example you should be able to: identify macroscopic vs particle representations, read chemical formula, represent bonding detail in molecules, know that some elements exist as diatomic molecules, and be able to interpret organic chemical formulas from line drawings.

Objective 4: Understand the relationship between the composition of atoms and their properties.
As an example you should be able to: identify the number of protons, neutrons, and electrons for any isotope or ion, approximate the relative abundance of certain isotopes given the periodic table and additional information (for example, the number of isotopes and the number of neutrons in each), and calculate weighted averages, isotopic masses or relative abundances.

Objective 5: Understand the basics of chemical reactions.
As an example you should be able to: balance chemical equations, correctly use terms and states of matter and correctly represent chemical formula.

Objective 6: Understand the basics of mixtures and chemical reactions involving water as a solvent.
As an example you should be able to: define key terms of mixtures, represent solutions on a macroscopic and particle-level and quantitatively represent concentrations.

Objective 7: Understand quantitative relationships between substances represented in a balanced Chemical equation.
As an example you should be able to: do stoichiometric calculations involving moles, masses, volumes, pressures, particles, and concentrations of reactants and/or products also including limited quantities of a reactant.

Objective 8: Understand the basics of the properties and behavior of gases on both the macroscopic and particle level.
As an example you should be able to: relate pressure, volume, temperature and amount of an ideal gas, explain the ideal gas law in terms of gas particles, and calculate properties of a mixture of gases.

Objective 9: Understand the basics of the modern model of the atom as it applies to to electrons in atomic orbitals as well as writing electron configurations.
As an example you should be able to: define key terms, know the rules for relative energy of atomic orbitals, apply Hund's rule and correctly write electron configurations.

Objective 11: Understand periodicity of certain properties of the elements.
As an example you should be able to: define key terms, give periodic trends for certain properties, and give general descriptive chemistry facts.
Objective 11: Understand chemical bonding and molecular shape.
As an example you should be able to: be able to draw a Lewis dot structure, determine a molecular shape from VSEPR theory, determine molecular polarity and determine bond order.

Objective 12: Understand the experimental nature of science.
As an example you should be able to: define all components of the scientific method, identify key experiments and the conclusions made (particularly in atomic and electronic theory), and maintain the correct number of significant figures throughout the calculations.

In order to measure the degree to which students in this course meet the objectives for this course, the university criterion of understanding and applying the major concepts of a natural science discipline, including its breadth and its relationship to other disciplines will be measured using the final course exam. This final exam will be graded based on correctness of responses and, where appropriate, as supported by student work in problem solving.

UW System Shared Learning Goal: This course also meets shared UW System Shared Learning Goal 2: “Critical and Creative Thinking Skills including inquiry, problem solving, and higher order qualitative and quantitative reasoning.” This is met through the course objectives as described previously.

Time Spent on the Course:
To estimate the time that a student should expect to spend on this course, one can use the standard method of a minimum of 3 hours outside of class for every hour in class. Therefore for a 5 credit course (counting laboratory as only one hour), a student may expect to spend a minimum of 15 hours per week on the course outside of class. This includes studying, reading, doing homework, writing laboratory reports and rewriting class notes.

Some notes on studying
Learning in this class may come with hard work and dedication. Please remember that much of your learning takes place through your own reading of the textbook, reading of your lecture notes, working problems, and conversations with me, your TA, and your classmates. Please do not expect to learn all of the concepts by attending lecture only. Your teaching team (me and your discussion TA) will work cohesively to present you with learning opportunities. To best use these opportunities, please come prepared. Otherwise much of what is discussed may be confusing or frustrating. I am hopeful that by the end of the semester, you will find that learning chemistry is exciting and rewarding.

Here are some tips for success in Chemistry 100:
1. Read the text (on the lecture material for the day) before attending the lecture.
2. Attend lecture, discussion and laboratory sessions. Take these times seriously. Be on time, stay attentive and take notes.
3. Use your lecture notes – how may be very individual to you. This could include recopying or rereading after lecture (the closer to the lecture the better), adding to lecture notes from textbook material, adding problems, or discussing within a study group. Your lecture
notes should be considered another source of information for this course (like your textbook).

4. Do as many problems as you are able – more than those assigned. You will probably have to average 3-4 problems a day, seven days a week to be successful in the course. Don’t wait until right before the exam – you will most likely be overwhelmed and unable to properly understand the material. If you have difficulty solving a particular problem, go back to the more straightforward related problems in the text and work them first. Indeed, one of the main purposes of this course is to help you develop your own method of thinking through problems. See your homework as an opportunity to test yourself on your own learning – this will allow you to find where you have succeeded in understanding and where you may still need to work through some concepts. Please do not wait until a quiz or exam to test your learning. See me if you would like help with ways to check your learning.

5. Form a study group or attend the group tutoring sessions – these can be a very effective method of learning.

6. Strive for understanding instead of just familiarity. It may take several attempts to gain the level of understanding that will allow you to articulate and use the models presented in this course. Be patient with yourself!

7. Be proactive! If you are struggling to understand something – seek help. Chemistry builds on previous concepts – without fully understanding one concept, it is very difficult to understand the next concept on which it builds.

I hope your experience this semester will be an enjoyable one! rewarding one.