Welcome to CHEM 119. As the science that describes matter, chemistry is central to our understanding of many fields from health to the environment to the evaluation of materials. Rapid new developments in very diverse areas virtually guarantee that chemistry will become even more important in the years to come. Knowledge of chemistry will surely be a vital ingredient in your liberal arts education and an essential foundation for your technical education. As educated citizens, it is likely that it will be important for you to be able to understand, interpret, and evaluate information that involves the molecular world. Check with your advisor if you have any doubts concerning the suitability of this course for your degree.

CHEM 119 and 120 are the first-year chemistry sequence in the core curriculum. These are 4-credit courses that contain both lecture and laboratory portions. This lecture is a part of a much larger program. Those of us in the First Year Chemistry Program and the Chemistry Department at Texas A&M University are committed to providing a meaningful and stimulating course. Each section of this course is independent of the other instructors’ sections, but we strive to cover common content, etc.

This handout outlines the course policies for my sections. Other instructors’ policies may differ slightly. You should read this material carefully to familiarize yourself with the various rules and procedures, especially those that govern examinations and grades. The objectives of this course are to develop your:

1. problem-solving skills and critical thinking abilities,
2. knowledge of general concepts in chemistry,
3. understanding of chemical terminology used in society,
4. ability to perform basic chemistry calculations,
5. appreciation of the importance of chemistry in society, and
6. positive attitudes towards chemistry.

Specific learning objectives (what you should be able to do) will be given for each exam as a handout in lecture. I expect you to have the following prerequisites:

1. basic math and chemistry skills,
2. curiosity about the world around you
3. willingness to learn (even though your friends say chemistry is yucky)
4. commitment to attend each class (Chemistry "builds" on itself, thus you are lost if you miss earlier steps)
5. commitment for regular study (starting the first day!) 6-10 hours per week is average for reading and problem solving, preferably some time every day. NOTE: We will MOVE FAST!

A calendar is attached, which contains exam dates, reading assignments, and a schedule for lecture & lab. In order to get the most out of lectures in this course, it is beneficial that you come to class prepared. In the First Year Chemistry Program, we try to make ourselves approachable both in and outside the classroom. Feel free to call upon me whenever you have a question. Subsequent sections will give the details concerning the Exam Reviews and Web pages for this course. I look forward to a good semester.

Vickie M. Williamson 8/12/19
PHILOSOPHY BEHIND MY TEACHING
The philosophy of how students learn that is held by an instructor should directly impact his/her philosophy of teaching. As a teacher, my job is to facilitate student learning. As a chemical education researcher, my job is to investigate strategies that improve student learning. I believe that learning is an active process in which the individual builds or constructs meaning from experiences and events, which must be integrated into their existing conceptual frameworks. This is constructivism to some, but I had rather explain my philosophy than use a “buzz word” that might convey misconceptions. I believe that students learn best from direct experience, when they are active in the educational process. At primary grades, direct experience with concrete objects is required. As we mature, this direct experience can take more abstract forms. Methods to actively involve students can be incorporated even into a large lecture class. These include the use of questioning skills, ‘wait time’, analogy, visual aids, practice, the type of problems assigned, etc. Equally important to the process is drawing meaning from this direct experience through discussion and reflection. Last is the integration of the new idea or meaning with our existing understandings. These ideas are well-represented by a learning cycle approach, in which students gather data about a phenomenon, draw generalizations, and apply or extend the generalizations in other contexts.

COURSE POLICIES

LECTURE REQUIRED MATERIALS:
(1) Calculator suitable to use on lecture exams. Calculators may not have alphabetic memory. (See later discussion under 'lecture exam administration'.)
(2) The Textbook and homework are combined. The bundle can be purchased from http://www.owlv2.com/tamu_fa19.html at a special price for TAMU. At this website, choose the Chem 119/120 button, then find our section and click the ‘register’ button. After registering go back to the http://www.owlv2.com/tamu_fa19.html at click on chem 119/120, then purchase by our section. The best deal is if you are going to take chem 120, you should buy the chem 119/120 24-month access for the epack combo with a loose-leaf hard copy version of the entire textbook ($85) ISBN13: 978-1-337-74832-2. This means you will already have the books for chem 120. Epack means that you get a loose-leaf hard copy mailed to you (BUT in this book the electronic copy of the textbook will be in the homework. For 119 only, you can choose a 6-month access with a loose-leaf hard copy of the text for $65 ISBN13-978-1-337-81151-7—BUT note that you will have to buy an additional books for chem 120!). There is also a version for only the electronic versions for 6 months, but it is $45 ISBN13-978-1-337-62198-4. All of these also have a number of videos to help with various topics.

We are using the 1st edition of General Chemistry: Atoms First by Young, Vining, Day, and Botch. I would recommend that you RETURN WHAT YOU HAVE IF YOU PAID MORE THAN $85 FOR IT! There will also be a Homework help desk to give you help with purchasing and /or registering during the first week or so of the semester. I will publish the hours for this on the homepage. NOTE: THE ISBNS GIVEN ABOVE ARE FOR THE BOOKSTORE, THE CHEAPER ONLINE VERSIONS HAVE SLIGHTLY DIFFERENT NUMBERS, BUT ARE THE SAME.

(3) You will need an iclicker2: REEF polling is not needed. The university-approved non-REEF is ISBN- 9781429280471. It costs 56.00 new or less for used, plus tax for the device. Both have no cost to register your clicker into a course. We won’t use the reef polling, but you might need the new for other classes. Once you buy the clicker, you can use it for all your courses that require iclickers for the remainder of your time at Texas A&M. You can also sell it back to the bookstore or resell it. There are options to rent, but these are almost the same price as to buy, and you would pay more to rent both semesters for chem 119 and 120. We will use iclicker classic. You can purchase your iclicker2 at the Texas A&M Bookstore and other bookstores. You will need to register your clicker for the class. You can register at: https://www1.iclicker.com/register-clicker Be sure to use your TAMU ID number without any spaces or dashes. You will need to use it once in class to complete your registration.

LECTURE READING ASSIGNMENTS:
Lectures are designed to help you in developing an understanding of the material being
emphasized. To get the most out of lecture, one should always keep up with the assigned reading. Specific reading assignments will be given in lecture. With some chapters, you will be asked to read ahead of lecture, with others behind lecture. Tentative chapters are shown in the Calendar.

LECTURE SCHEDULE:
There is a tentative schedule at the end of this syllabus. Topics and chapter references are subject to change. Special announcements and schedule changes will be announced at the beginning of the lectures and posted on our homepage (see the web address below).

LECTURE ATTENDANCE:
I will not be taking attendance as such throughout the semester. However, to encourage you to attend class, there will be clicker points almost daily and could be periodic in-class quizzes that will account for part of your lecture grade (See grades below). YOU SHOULD ATTEND ALL CLASSES.

CLICKER POLLING/PARTICIPATION:
During the semester, you answer will questions during lecture. These will be done both individually and in groups during class. Some may be quiz-like, in that there is a 'correct' answer, others may be opinion based. I DO NOT expect you to get these all correct, so I only require 70% of the clicker points for FULL course credit. There are NO makeup clicker assignments, as the lower percent required should take care of necessary absences, forgotten clickers (bring your clicker to each class), or bad batteries. We will use clickers from day 1, but will count clickers in about a week. Clicker points will be posted for each day at first so you can be sure your clicker is working prior to them counting, then weekly. You only have 2 weeks to notify me if you believe there is an error in your points. Clicker points will be transformed into course points at the end of the semester using this scheme:

<table>
<thead>
<tr>
<th>Percentage of Clicker Points possible</th>
<th>25-29%</th>
<th>30-34%</th>
<th>35-39%</th>
<th>40-44%</th>
<th>45-49%</th>
<th>50-54%</th>
<th>55-59%</th>
<th>60-64%</th>
<th>65-69%</th>
<th>≥70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number added to your course points</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

ASSIGNMENTS:
During the semester, you will have assignments during the semester. Each assignment will be worth 5 course points. The best 5 assignments will count. There will be at least 7 assignments totally. These may be in various formats (written, clicker, on-line). Some may be UNANOUNCED in class quizzes; others will be on-line. There are no make-ups for in-class assignments; if you miss one, it will be one you drop. On-line and out-of-class assignments can have their due date extended for university-approved absences. Assignments may be taken from the assigned problems, demonstrations, material covered in lecture, etc. Assignments have two purposes: 1) to set deadlines to encourage you to keep up, and 2) to give me an idea of your understanding of the concepts.

LECTURE HOMEWORK ASSIGNMENTS:
Homework problems will be assigned for each topic of study. Homework from one lecture will be due in about 2 days. Homework will be assigned a grade about every 2 weeks and will be called a homework set. Each set of the seven homework sets will contain assignments for about two weeks of class and together will be worth 12 course points, for a total of 70 points for the semester. Homework MUST be turned in on time. The purpose of homework is to prepare you for exams. Additional details are on the schedule and will be given in class.

<table>
<thead>
<tr>
<th>Percentage of instructional units correctly completed and turned in on time for each of the 7 sets</th>
<th>&lt;40%</th>
<th>40-49%</th>
<th>50-59%</th>
<th>60-69%</th>
<th>70-79%</th>
<th>80-89%</th>
<th>90-94%</th>
<th>≥95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number added to your course points</td>
<td>0</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
</tbody>
</table>
LEARNING OBJECTIVES:
See the list at the end of this document. These are the skills that you should be able to do after all of your study. The exact coverage for each exam will be given in class.

LECTURE EXAMS AND FINAL:
There will be 4 lecture exams (Exams 1, 2, 3 and 4) given on the days indicated on the Calendar. Additionally, there will be a Final Exam. These exams may be all multiple-choice or include combination of multiple-choice questions that will be machine graded and non-multiple choice questions that will be hand graded.

(1) Lecture Exams: These are 45-minute exams given during the regular lecture times. Each carries a value of 100 course points with 15-25 questions. You MUST have a Photo I.D. in order to take exams.

*At the end of the semester, the lowest of the four regular exams can be dropped and replaced by the percentage you receive on the final examination (if it is higher).

(2) Final Lecture Exam: The Final Exam will be a 2-hour, 165-point exam covering all the chapters taught during the semester. The final may contain standardized and/or professor-written portions. The final will be COMPREHENSIVE. The final is scheduled for Monday, Dec. 9, 2019 from 10:30-12:30 AM for the 12:40 lecture and Tuesday, Dec. 10, 2019 from 3:30-5:30 for the 1:50 lecture in room 100 HELD. Please do not expect to take the final exam at any time other than the scheduled time FOR YOUR SECTION, unless you have made arrangements with me. You must bring a PHOTO I.D. to the Final Exam. Do not be LATE; as soon as the first person has left the final, no one will be allowed to begin the final.

(3) Make-up Lecture Exam: For students who have university-excused absences (or very good ones) and who also notify me (the instructor) within 2 academic days (M, T, W, R, & F), a make-up test will be arranged. I require a written documentation for the excused absence. Illness must have a confirmation from a health care professional. The make-up exams will be at least as difficult as the regular exams. The time for the makeup exam will be set after the 2-day signup period, from student schedules. Makeup exams are scheduled within a week of the regular exam. Makeup exams are free response, but you can get partial credit on each problem; they cover the same material and learning objectives.

LECTURE EXAM ADMINISTRATION:

(1) Check the exam seating assignment on the bulletin board outside Room 100 Held and on ecampus one day in advance. Each exam has a different seating assignment.

(2) Arrive at the exam on time. Cheating or bringing in material with intent to cheat will result in a zero for the exam or a more severe penalty.

(3) Bring to the exam at least two sharpened #2 pencils, an eraser, and a PHOTO I.D. (your TAMU I.D. card or a driver’s license will work). Pencil sharpeners and calculators (with certain restrictions) may also be brought. There must be NO "sharing" of calculators during an exam. Any other items must be "enclosed" out of sight in a briefcase, pack, purse, or sack, and stored under your assigned seat.

(4) Students cannot use calculators that are programmable or have alpha-numeric capabilities for the exams. This means no TI-eighty anything. You want a scientific calculator under $15. You can check to see if the keystroke is what you prefer by hitting the log key prior to purchase. Check with me if you have any questions. Any student attempting to use an unacceptable calculator, smart watch, cell phone, or any other electronic device will receive a zero for the exam plus other penalties.

(5) Follow the directions given to you as you enter the exam room. Do not write on the back of the scanner sheet. Failure to follow these directions may result in a withheld or zero grade. In addition, note that the answers have to be recorded on the provided standard scan sheet to be graded.
(6) During the exam, **keep all work covered** as much as possible. Talking or looking around the room will result in a withheld grade for the exam.

(7) Work carefully, but you must finish in the allotted time; exams handed in late will not be graded. You will be able to see your grades on ecampus.

(8) **For special seating requests** such as a left-handed seat or a table sign up at the beginning of the semester on forms I bring to class or go to room 412 HELD. You only need to turn in one request for the semester.

(9) If you believe that your scan is misgraded, you need to fill out a regrade form. These are available in room 412 HELD. Fill the form out and turn it in to room 412 HELD.

(10) **If you wish to review your exam, you must do so prior to the next exam.**

**REVIEW SCHEDULE:**
A Review Session will be posted on line for each hourly exam. You will have two sample exams for each of the 4 hourly exams. There will also be sample questions on the new material from the days of lecture after exam 4, which will be new for the final. Sample Exams will be in the form of pdf files and screencasts that you can play over as needed with Quicktime, Windows Media Player, on a computer, an ipod/ipad, or on a tablet. All links will be on Williamson’s 119 Bulletin Board (see the section below). I will also hold additional office hours near the exams for extra questions.

**SPECIAL ASSIGNMENTS:**
During the semester, you be given a special assignment(s) that will total 10 course points. In the past these could involve take-home worksheets, written lecture summaries, on-line assignments, or short essays. The form of the special assignments will be announced in class later in the semester.

**ACADEMIC DISHONESTY:**
Students are expected to be the sole source for any work submitted in their name. The utilization or submission of work of others is a violation of Texas A&M University scholastic dishonesty policies and disciplinary steps will be taken. Only **authorized** electronic or printed materials or equipment may be used in or near the classroom. As commonly defined, plagiarism consists of passing off as one’s own the ideas, words, writings, etc., which belong to another. **In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person or if you do the work but represent it as someone else’s (like using another student’s clicker).** Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research and knowledge cannot be safely communicated.

Study groups can be a valuable aid to learning. Within the group you should discuss your answers to homework problems. Your group can discuss questions with other groups. Quizzes, exams and the final must be done on your own, unless otherwise specified by the instructor. **Academic dishonesty will not be tolerated in any form** and will be reported to the proper university officials. Expulsion for academic dishonesty does not look good on one's permanent record and is not worth the points you are trying to gain by cheating. If you have questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section “Scholastic Dishonesty.”

The Aggie Honor Code is that:
*“An Aggie does not lie, cheat, or steal or tolerate those who do.”*

Please review the Honor Council Rules and Procedures on the web: [http://aggiehonor.tamu.edu](http://aggiehonor.tamu.edu)

Reports of academic dishonesty will be filed for those who fail to follow the code.
GRADE CALCULATIONS: Grades will be calculated on a point basis.

Lecture Points Possible:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points Possible</th>
<th>% of Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essay Assignment</td>
<td>10</td>
<td>1.4</td>
</tr>
<tr>
<td>Clicker Polling (only 70% of clicker pts required)</td>
<td>16</td>
<td>2.3</td>
</tr>
<tr>
<td>Homework (7 @ 12 pts each)</td>
<td>84</td>
<td>12.0</td>
</tr>
<tr>
<td>Assignments (best 5@ 5 points each)</td>
<td>25</td>
<td>3.6</td>
</tr>
<tr>
<td>Exams (4 @ 100 points each)</td>
<td>400</td>
<td>57.1</td>
</tr>
<tr>
<td>Comprehensive Final</td>
<td>165</td>
<td>23.6</td>
</tr>
</tbody>
</table>

Total points from Lecture: 700
Departmental Pre-Course ALEKS Assignment: 50
Laboratory Points Possible: 250

TOTAL POINTS for the Course: 1000 ~100%

Final Grade Cut-Off: A 1000 - 900
                    B 899 - 800
                    C 799 - 700
                    D 699 - 600
                    F 599 - 0

You can be assured of the letter grade that is indicated if you fall in the above ranges. The final grade cut-off may be slightly lowered at the end of the semester. Each semester’s ranges and each lecture sections’ ranges are independent of each other.

Students missing only a small portion of the course will receive a grade of "I" (Incomplete) if they request this grade and meet the University criteria for this temporary grade.

*At the end of the semester, the lowest of the four regular exams will be dropped and replaced by your percentage on the final exam (if it is higher).

YOUR GRADES:

PLEASE KEEP A RECORD OF YOUR LECTURE POINTS ON THE TABLE BELOW.

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Points Received</th>
<th>Exams</th>
<th>Points Received</th>
</tr>
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<tbody>
<tr>
<td>#1</td>
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<td>Best 5:</td>
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<td></td>
<td></td>
<td>#2</td>
<td></td>
</tr>
<tr>
<td>Essay Assignment:</td>
<td>Points Received</td>
<td>#3</td>
<td></td>
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<td>#4</td>
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<td></td>
<td>#5</td>
<td></td>
</tr>
<tr>
<td>Departmental Pre-Course Assignment:</td>
<td>#6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Points Received:</td>
<td></td>
<td>#7</td>
<td></td>
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</tbody>
</table>
TEXAS A&M SERVICES FOR STUDENTS WITH DISABILITIES:
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, either temporary (e.g. broken arm) or permanent (including a learning disability), please contact the Department of Student Life, Services for Students with disabilities at White Creek on west campus or call 845-1637. (Hours: 8 AM to 5:30 PM). For additional information, see http://disability.tamu.edu If you have any questions, see me.

COPYRIGHT:
The handouts used in this course are copyrighted. By “handouts,” I mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, lab problems or study sheets, in-class materials, review sheets, and additional problem sets, notes, etc. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission.

BULLETIN BOARDS:
Solutions to short answer assignments and exam questions will be posted for this class in the glass bulletin board near room 122 and 124 Heldenfels. We also have an electronic bulletin board described below.

COURSE INFO VIA THE WEB AT WILLIAMSON’S 119/120 BULLETIN BOARD:
You can find the latest news, objective list, frequently asked questions, etc. on my personal webpages. (http://chemed.tamu.edu/chem119/). BOOKMARK AND CHECK THIS SITE FREQUENTLY. Special announcements and schedule changes will be announced at the beginning of the lectures and posted on our homepage.

HELP: You can do these things to improve your grade:
(1) Attend all class periods.
(2) Keep up with your assigned reading and do the homework problems.
(3) Come to class prepared (ask questions if you don’t understand).
(4) Take all tests assignments, homework, and assignments.
(5) See me during office hours or make an appointment with me to discuss anything you don’t understand or can't work.
(6) Try a study group. Some will work, while others will not. Groups with students from your major or residence often work the best.
(7) Attend SI.
(8) See the TA helpdesk in room 406 HELD (but choose a time in the middle of a lab time)
(9) As a last resort, engage a tutor for hire. Tutors who can give you individualized help are best. I have a list of individual tutors for hire.
(10) Follow Williamson’s Study Rules

WILLIAMSON’S STUDY RULES:
(1) The 15-minute rule
Don’t spend over 15 minutes on any one problem unless you are making progress. Seek help, you are missing a point, and you don’t want to become frustrated.

(2) The 2-lecture rule
Don’t let any more than 2 lectures pass when you don’t understand something. Seek help. (This rule means that if you attend one lecture and a topic is fuzzy, go home, read about it, and try problems, remembering the 15-minute rule. Go to the 2nd lecture. If all is not clear by the second lecture, seek help.)

(3) Order of Study Rule
- Hear the lecture
• Read the text and try the practice problems from the book (remember the 2 rules above).
• Consider rewriting your notes to better organize the material. Write what is the important information from each slide in the ppt.
• Do assigned homework.
• As an exam nears, do old exams that are on-line. Take at least one of them under ‘exam conditions’ (set the timer, use only the tables and equations that will be on the exam).

(4) After an Exam Rule
• Score your exam with the key
• Ck the class average (compare your score to the average)
• Go over the exam for 2 things (You must review an exam before the next exam during office hours.)
  1) Can you work it now, easily getting the correct answer? Practice till you can.
  2) Why did you miss each question in the first place? Look for patterns so you can correct this error for the next exam (the same reason why you missed multiple questions). In the past students have told me that possible patterns are:
    • **Misreading the problem.** The problem asked for least electronegative, and the student answered it for most electronegative. In this case, marking the exam question with circles, boxes, etc. to help focus on the question BEFORE reading the possible answers will help.
    • **Choosing the wrong equation or method to use.** In this case you need practice planning your problem solving strategy. Go to homework or sample exam problems you have already done. Reread the problem and make a plan for solving it. Then ck your plan by looking at your previous work. Do NOT simply recalculate the problem. Don’t use a calculator to practice planning.
    • **Missing a relationship between variables.** This may be a conceptual type problem. You missed it because you didn’t know the trends, etc. You can help this by using the objective list to write out every relationship. For example, if the objective says to ID the trend in electronegativity, you could write out on an index card the relationship between position in the periodic table and electronegativity (electronegativity increases as you go up a family and across a period, with F being the most electronegative).
    • **Miscalculation:** You read the problem correctly; you chose the correct equation, but you got the wrong answer. In this case you need practice with your calculator. Go to the sample problems in the textbook, find the place where all values have been substituted in, and use your calculator until you can get the same number solution as the text.

(5) Study Group Rules
• Groups MUST
  1) Have regular meetings
  2) Meet at a place conducive to study
  3) Have 3-5 members
• Use your meetings to go over:
  1) assigned problems
  2) old quizzes
  3) objectives
  4) sample exam questions
• Keep your meeting on task. Socialization is great, but remember the purpose is to improve your understanding of chemistry (your grade too).
• If you are the brightest in a group, you benefit by verbalizing and defending your answers to others.
• If you catch on more slowly than others in a group, you benefit hearing and seeing the concepts explained by someone other than me.
• You DO NOT have to stay in the first group you try. Please try a group for a couple of meetings.
• Every study group will not be successful for you. Feel free to try another group. Grouping with those in your major can be helpful.
### TENTATIVE LECTURE SCHEDULE 8-18-19
**Chem 119 Fall 2019-----Dr. V.M. Williamson**

<table>
<thead>
<tr>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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<td>8/25</td>
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<td>1. Basic Measurement</td>
<td>2. Atoms</td>
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<td></td>
<td>1. Basic Measurement</td>
<td>*5pm Last day to add new courses or change sections</td>
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<td>9/1</td>
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<td>9/3</td>
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#### 1. Basic Measurement
- **Unit 1**

#### 2. Atoms
- **Unit 2**
- Unit 3, Sections 1-3

#### 3. Atoms, Part 2
- **Unit 4**
- Unit 3, section 4 and 5

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#### 4. Molecules
- **Unit 5**

#### 5. Bonding and Geometry
- **Unit 6**
- Unit 7

#### 6. Chemical Equations & RXN Stoichiometry
- **Unit 8**
- **Unit 9**
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**HWK SET #4 ENDS**

**HWK SET #5 ENDS**

**HWK SET #6 ENDS**

**HWK SET #7 ENDS**

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**EXAM 3**

**EXAM 4**

| 11/24 | 12/2 | *Prep Day
*Redefined Day - attend Friday class |
|-------|------|-------------------------------|
|       | 12/3 | *Prep Day
*Redefined Day - attend Thursday classes |
|       | 12/4 | Last day of class
*Prep Day |
|       | 12/5 | *Reading Day
*No classes or exams |
|       | 12/6 | *Finals begin
*Prep Day
*Redefined Day - attend Thursday classes |

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**FINAL EXAM**

12:40 Lecture
10:30-12:30 AM
HELD 100

1:50 Lecture
3:30-5:30PM
HELD 100

**Grades due to Registrar by noon on 12/16**
CheM 119  Learning Objectives for Dr. Williamson
You should be successful on each exam, if you can do the following:
(Note any changes will be announced in lecture or on the web bulletin board.)

Basic Measurement
1. Know basic units and prefixes (to convert metric to metric)
2. Define accuracy, precision, mean, and standard deviation
3. Read & express measurements in sig. figs
4. Carry out math operations in sig. Figs (add, sub, multiply, divide)
5. Express numbers in scientific notation
6. Carry out math operations in sci. notation
7. Convert units using the Dimensional Analysis (factor-label) method
8. Define the 3 temperature scales & convert between them
9. Define density. Given 2 of the 3 (volume, mass, or density), calculate the 3rd
10. Use evidence to distinguish between mixture/pure and states of matter
11. Use evidence to distinguish between element/compound or atom/molecule
12. I.D. chemical and physical properties
13. I.D. chemical and physical changes

Atoms
1. Describe and Evaluate Dalton’s Atomic Theory
2. Write symbols of elements given the name (v.v.) (1-36 + Ag, Pt, Au, Hg, Sn, Pb, I, Rn, U)
3. Describe the evidence for the nature of the atom from Dalton, Thompson, & Rutherford
4. Describe the composition of the atom in terms of p, e, and n
5. Determine the number of p, n, & e, given ‘X. (vv)
6. Determine atomic number and mass number of two or more isotopes
7. Explain and calculate atomic mass using % of isotopes (vv)
8. Describe the composition of an ion in terms of p, e, and n
9. ID metals, metalloids, families, groups, and periods in the Periodic Chart, including states of matter and diatomics.
10. ID trends in reactivity with water
11. ID trends in atomic radius and ionic radius
12. ID trends in Ionization Energy
13. ID E.M. radiation. (give types & relative wavelengths)
14. Calculate energy, wavelength, or frequency of light.
15. Describe evidence for quantified nature of energy (in electrons)
16. Describe the Bohr model of the atom
17. Give the Bohr electron configuration for elements 1-20.
18. Calculate the energy required to raise an electron to a higher energy level. (vv)

Atoms Part 2
1. ID trends in electron affinity & electronegativity
2. Explain probability, electron density, & orbital
3. Calculate wavelength, mass or velocity given 2 of the 3.
4. Give the shape and number of each type of orbitals
5. Describe the wave mechanical model of atom and explain trends with it
6. Predict similarity of properties by location in the periodic chart.
7. Write the ground state electron configurations for atoms & ions
8. Write orbital diagrams for atoms & ions; ID paramagnetic and diamagnetic
9. Explain the meaning of each Quantum Number
10. Write the Quantum numbers for an electron

**MOLECULES**

1. Identify the kinds & numbers of atoms in a formula (v.v.)
2. Write formulas from ions given names (v.v.)
3. Write the Lewis symbols for elements
4. Predict what ions are formed from given elements, using their place in the chart.
5. Write formulas for compounds, given their name (vv)
   - metal-nonmetal
   - variable valence metal-nonmetal
   - polyatomic compounds
   - Write the symbols and charge for polyatomic ions given their name (vv)
   - nonmetal-nonmetal
   - oxyanion compounds
   - acids
6. Define and use average atomic mass & amu
7. Define and use molecular mass & formula mass (weight)
8. Define and use the mole, Avogadro's number, & Molar Mass
9. Convert between moles, grams, & # of particles for elements or compounds
10. Calculate the mass or mass percent of an element or ion in a compound
11. Calculate empirical formulas given mass or % of elements
12. Calculate molecular formulas from the empirical given molar mass
13. Convert between moles, grams, & # of particles for hydrates

**BONDING AND GEOMETRY**

1. Predict what ions are formed from given elements, using electron structure.
2. Determine bond type: ionic, covalent, polar covalent.
3. Determine bond polarity
4. Write electron dot symbols for atoms, ions, and compounds
5. Write resonance structures for molecules
6. Describe the octet rule and its limitations
7. Assign formal charges
8. Summarize VSEPR theory
9. Determine the shape of molecules and ions (geometry)
10. Determine the bond angles in a compound or ion
11. Determine the polarity of a molecule
12. Determine bond order and bond length
13. Predict solubilities based on polarity
14. Summarize Valence Bond Theory
15. Determine the hybridization about an atom in a compound or ion
16. Determine the number of sigma and pi bond in a compound or ion
17. Describe the MO theory

**CHEMICAL EQUATIONS & RXN STOICHIOMETRY**

1. Identify the evidences of a chemical reaction
2. Write formulas (including diatomics) and balance equations (also know parts).
3. Find the moles of the product(s), given the moles of a reactant. (vv)
4. Find the grams of the product(s), given the moles of a reactant. (vv)
5. Find the grams of the product(s), given the grams of a reactant. (vv)
6. Calculate the percentage yield of a rxn. (% yield = actual yield/ theoretical yield x 100)
7. Determine the limiting reagent in a rxn.
8. Use the limiting reagent to calculate the grams and moles (stoichiometry) in a rxn.
9. Define ion, conductivity, and electrolyte
10. Describe dissolving at the particle level and the characteristics of solutions
11. Calculate M, mol, or L of a solution given 2 of the 3 or calculate M given density.
12. Calculate the concentration of a solution made by dilution.
13. Solve stoichiometry problems that use solutions.
14. Predict precipitates using a solubility table
15. Write molecular, complete ionic and net ionic equations
16. Distinguish between strong & weak acids or bases & between strong & weak electrolytes
17. Give operational AND theoretical definitions of acids and bases
18. Write products of acid-base rxns
19. Predict the products of gas-forming reactions
20. Use the relative activity of metals to predict rxn products
21. I.D. oxidation numbers in formulas
22. I.D. reducing and oxidizing agents

**THERMOCHEMISTRY**
1. I.D. endothermic & exothermic rxns
2. Define calorie, Calorie, joule. Convert between these units
3. Use 3 of these to calculate the 4th (Q, m, s, ∆T)
4. Describe the differences between heat and temperature
5. Predict and calculate changes in internal energy, work, heat
6. Predict ∆H in processes (+, - or ≈ 0)
7. Recognize standard state, standard conditions and state functions
8. Calculate the heat required for heating/cooling and phase changes
   9. Calculate ∆H using:
      • Heating/cooling curves
      • calorimetry
      • ∆H°
      • by combining known ∆H values
      • by using bond energies
      • by proportionality

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**STATES OF MATTER - GAS**
1. Describe the attributes of a gas
2. Convert between any two: torr, mm Hg, Pa, and atmospheres pressure
3. Describe the effect of pressure on volume (vv)
4. Describe the effect of temperature on volume (vv)
5. Define absolute zero, STP
6. Use the ideal gas law
7. Relate volume and # of moles
8. Use the combined gas law
9. Determine molecular weights of gases
10. Calculate the partial and total pressure of a gas mixture
11. Describe the Kinetic Molecular Theory
12. Calculate the rate of effusion
13. Describe deviations for ideality in gases
14. Calculate stoichiometry in gas rxns

**STATES OF MATTER - Liquids and Solids -**
1. Describe the Kinetic Molecular Theory & relate it to solids, liquids, & gases
2. Explain intermolecular forces (ion-ion, dipole-dipole; hydrogen bonding; London forces)
3. Estimate the strength of IM forces & relate this to viscosity, surface tension, evaporation, b.p., m.p., & vapor pressure
4. Describe the properties of liquids, including water
5. Interpret phase diagrams
6. Describe the properties of solids, including bonding types
7. Describe unit cells, packing, density, cell volume
CHEMISTRY 119 LABORATORY POLICIES

Laboratory TA: __________________________ E-mail: __________________________ Office hrs: ___________
Laboratory Coordinator: Edward Lee, Ph.D   E-mail: edlee@tamu.edu   Office: HELD 412

REQUIRED MATERIALS LAB:
(2) Hayden-McNeil Online
(3) Approved eye protection: Chemical splash goggles (fully enclosing goggles with four indirect vents) are required. These are the ONLY approved form of eye protection. No other goggles will be allowed.

Lab Safety:
- Student safety is a top priority in the Texas A&M Department of Chemistry.
- Protective eyewear, appropriate clothing and shoes that completely cover your feet must be worn at all times in the laboratory. Appropriate clothing includes pants or long skirts which come all the way down to the ankles so that no parts of the legs or feet are exposed and a shirt or top with sleeves.
- All CHEM 119 students accept a Lab Safety Acknowledgement (LSA) in Howdy upon registration.
- Furthermore, students must view a safety video and pass a safety quiz given during the first class meeting.
- Any student who does not view the safety video and pass the safety quiz will not be permitted to continue in CHEM 119.
- The safety guidelines associated with individual experiments are explained in the lab manual and will be presented at the beginning of each experiment.
- Prelab quiz questions regarding safety aspects specific to each experiment should be expected.
- Failure to adhere to any safety regulation while in the laboratory will result in a reduced performance score and/or expulsion from the laboratory.
- Eating, drinking, and smoking are prohibited in the lab at all times. Chewing gum or tobacco is also prohibited.
- Long hair must be held in place to the back of your head. You are responsible for bringing the bands or clips to hold back your hair.
- If you do not comply with the attire rules, you will be asked to leave the lab to get appropriate clothing. If you do not make it back to complete the lab, you will receive a zero for that particular lab.
- All personal belongings must be placed in the back of the room and any food/drink should be inside a backpack.

Further details on appropriate lab attire and other safety regulations are provided in the lab manual and will be explained during the first class meeting. If you are pregnant or become pregnant during this semester, it is important to speak to a Lab Coordinator so that safety concerns can be discussed.

Accidents and Other Incidents: Any illness or injury incurred in the laboratory must be brought to the attention of your Teaching Assistant or Laboratory Coordinator. In the event of serious injury, 9-1-1 will be contacted by the Lab Coordinator or Instructor and the situation will be assessed by the responding EMT team. Because students are not eligible for worker’s compensation, the cost of any care not provided by the Beutel Health Center must be covered by the student's personal health insurance plan.

Personal Electronic Devices: Cell phones, pagers and other personal electronic devices are NOT permitted to be used in lab. Unauthorized use of any electronic device could result in your expulsion from class.
Questions: If you have any questions regarding the laboratory course or specific experiments, e-mail your TA or go to the help desk in HELD 406. General questions regarding lost and found or other non-technical issues can be sent to chemfyp@chem.tamu.edu.

Communication and Conduct: All electronic communication with your TA, IA, the FYP office, and the Laboratory Coordinator must be conducted from a tamu email account. Emails sent to university email addresses are a permanent document of communication. Therefore, be sure that your emails are polite, professional and well-prepared before you send them. All emails should include the student’s first and last name, UIN, and the course and section number. Students are responsible for checking their tamu email on a regular basis to receive messages regarding the laboratory course. Please allow up to 48 hours for a response to emails. Responses will normally occur between 8 am and 4 pm, Monday through Friday. Inappropriate language and/or disruptive behavior can result in loss of credit at the discretion of the TA, IA or Laboratory Coordinator and/or reported to the Student Conduct Office.

eCampus: All of your grades for the course will be posted on the eCampus page for the laboratory, which can be accessed via: ecampus.tamu.edu. All supplemental information and/or handouts for experiments not included in your lab manual will be posted on eCampus. Furthermore, all online assignments and prelab quizzes can be accessed through eCampus. For more information regarding these assessments, see the prelab quizzes and electronic assignments sections under Online Assignments.

Students wishing to receive accommodations for disabilities for the laboratory portion of CHEM 119 must submit the appropriate paperwork to the FYP office in HELD 412. We are not responsible for providing any accommodations until after the appropriate paperwork has been submitted to the office.

Laboratory Assignments: Assignments associated with 6 laboratory experiments and 1 recitation comprise the majority of the lab grade. The points for each experiment are divided into as many as four categories, including: quizzes, performance and safety, data reduction and analysis, and reports. The other grade component is the lab final exam. A brief description of each of the course components is given below. A schedule of experiments and a point breakdown for all assignments is listed in the schedule found on the last page of this syllabus.

1. Prelab Quizzes: A prelab quiz will be administered for each experiment, or portion of an experiment for multi-week projects, in the course. All of the quizzes for the course are electronic, and will be administered through the course page on Hayden-McNeil Online. The prelab quiz for each experiment will be due prior to the beginning of the class meeting in which the experiment is scheduled to be performed.

Please Note:
- Prelab quizzes will not be subject to extensions and there will be no opportunities to make-up missed quizzes.
- Although use of the laboratory manual and other printed or electronic resources cannot be restricted, you are required to complete the quizzes individually.
- Students should also be aware that successful completion of the quizzes will require adequate preparation.
- If you experience a technical issue with a Hayden-McNeil assignment, contact the Support Team immediately. Technical difficulties will not be considered an excuse for non-completion, so we encourage you to begin and complete the assignment well before the deadline.
- No time extension will be granted due to loss of connection or computer failure. The only exception would be a system-wide outage of the network.
- All prelab quizzes for the next week will be made available after 7:00 PM the day your lab section meets. Furthermore, as this is graded course work, all rules and policies regarding the Aggie Honor Code apply to this assessment.
The prelab quizzes are designed to test a student’s preparedness for the upcoming experiment and their understanding of basic chemical concepts relevant to each experiment. Quiz questions may cover but are not limited to the following topics: basic calculations; experimental aim; ecological/environmental issues; analytical techniques; basic chemical concepts; experimental procedure; data manipulation, and equipment and reagents. At least one general safety question will be included in each quiz.

2. Safety and Performance (S&P):
   - The safety and performance grade includes adhering to safety guidelines (including wearing appropriate goggles and attire), maintaining a clean workspace, and being organized and prepared for the day’s activities.
   - Safety violations will result in lost points and can lead to dismissal from the laboratory. The performance form asks whether each student a) wore goggles throughout the entire exercise; b) was appropriately dressed; c) maintained a clean environment; d) was prepared; and e) followed directions.
   - Each violation costs the student 3 points (making negative scores possible). The TAs must strictly follow the rules and are not allowed to exercise discretion in any of these criteria.

3. Data Reduction and Analysis (DRA): The laboratory manual provides a series of directions, calculations and questions after each experiment. These exercises are designed to guide students through the analysis of their experimental data. The data reduction and analysis assignment is due at the beginning of the following lab period. All calculations and questions will be completed on a worksheet found in the lab manual. Any plots or data tables should be completed using an electronic software package such as Microsoft Excel. Paper copies of all tables and plots should be attached to the data reduction and analysis worksheet. A hand-written sample calculation must accompany any calculations performed with electronic spreadsheets.

4. Lab Report: Most scientific findings are communicated through scientific research articles published in scientific journals. A brief lab report, will be written for one experiment in Chemistry 119. The required format for this assignment is described in the lab manual and specific guidelines are provided on eCampus. Both physical (to TA) and electronic submission (eCampus) of these reports will be required to receive credit. Specific guidelines will be provided on eCampus. Please print the digital receipt and attach it to the front of your report and hand it in to your TA at the beginning of your lab. Failure to submit both an electronic and paper copy of your report will result in complete loss of credit for this assignment.

5. Online Assignments: During the semester, you will complete one assignment on Hayden-McNeil Online. These assignments consist of two parts: a tutorial and a set of questions. The tutorial is designed to help you learn the key concepts in the exercise. The questions will test your understanding of and ability to apply those concepts.

   Each assignment will be open for an extended period; the dates are given at the end of this syllabus. These assignments will not be subject to extensions and there will be no opportunities to make up missed online assignments.

   Technical difficulties will not be considered an excuse for non-completion, so we encourage you to begin and complete the assignment well before the deadline.

   These exercises are to be completed independently; all rules and policies regarding the Aggie Honor Code apply to these assignments.

6. Lab Practical Exam: One practical exam will be given in CHEM 119. This exam will be administered in lab during your regular lab time the week of November 25th. You will need to be appropriately dressed to complete lab work.

Assignment Due Dates and Late Policy:
   - All post-lab assignments (DRA or Lab reports) will be due at the beginning of each lab meeting.
   - A 4-point deduction per day beginning on the due date will be applied to any late assignments. For EXCUSED ABSENCES ONLY, the 4-point deduction will begin at the end of the working day after the end of the absence.
• Assignments submitted more than one week after the due date will not be graded.

**Determination of Laboratory Points:**
• Student scores from the assignments described above will be summed and the totals will be converted into a score out of 250 points. It is possible that the conversion may vary from section to section.

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= Preliminary Total Points

\[
\text{Preliminary Total Points} = \text{Laboratory Points (out of 250)} \approx 2.4
\]

• The Laboratory Instructor’s policy will attempt to compensate as much as possible for differences in the grading habits of TAs.

**Absences And Attendance In Lab:**
All absences from lab must be reported to and processed by the First Year Program office in HELD 412 in order to request a make-up lab. Your TA does not have the authority to approve a request for a make-up lab or to schedule a make-up experiment. An absence for a non-acute medical service (such as a routine doctor’s appointment) does not constitute an excused absence. Missing lab for not having goggles or other required safety attire is not an excused absence. We are under no obligation to allow make-up opportunities for unexcused absences. All students with University-approved excused absences may request to schedule a make-up. The student is responsible for providing documentation substantiating the reason for the absence. See Student Rule #7 (http://student-rules.tamu.edu/rule07) for further guidance.

Lab sessions begin with important information concerning the procedures to be followed and safety considerations. If you arrive late, it is at the TA’s discretion as to whether you can stay for that lab session as you may not be able to properly follow the procedures and the safety instructions discussed prior to your arrival.

**Academic Dishonesty:**
Even though laboratory data is collected in pairs all submitted work must be completed individually. Each student has to turn in their own pre-lab, post-lab, and data sheets. Copying entire or portions of prelab, postlab, and data sheets instead of turning in your own original work is considered cheating. Allowing others to view your work is also cheating. Turning in a post-lab and data sheets for a lab you did not complete is also considered cheating. Changing experimental data after leaving lab, making up or borrowing data that you did not obtain in class is also a violation of the honor code. Unauthorized collaboration via text messages, social media (Facebook, GroupMe, etc.), or any other means of passing or receiving information about exams or any other graded material are all considered honor violations. All honor violations will be reported to the Aggie Honor System Office.
<table>
<thead>
<tr>
<th>Week of (based on section number)</th>
<th>Assignment</th>
<th><strong>Last Makeup Lab</strong></th>
<th>Points Possible</th>
<th>Pre-Lab Quiz</th>
<th>S &amp; P</th>
<th>DRA</th>
<th>Lab Report</th>
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<tr>
<td>8/26</td>
<td>8/26</td>
<td>Safety</td>
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<tr>
<td>Opens on 9/2</td>
<td>H-M Online Activity: Significant Figures</td>
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<td>Due 9/16 at 10 PM, all sections</td>
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<td>9/2</td>
<td>9/9</td>
<td>Exp. 1: Sig. Figs. and Exp. 2: Scientific Measurements</td>
<td>9/12</td>
<td>9/19</td>
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<td>9/16</td>
<td>9/23</td>
<td>Exp. 4: Data and Graphics</td>
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<td>9/30</td>
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<td>Exp. 5: Physical Properties</td>
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<td>10/14</td>
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<td>Exp. 10: Chemistry of Recycling</td>
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<td>Exp. 11: Water Hardness</td>
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<td>11/25, 12/2*</td>
<td>Final Lab Practical</td>
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* Due to the Thanksgiving holiday, Nov. 27-29, students in Wednesday-Friday lab sections will take their final exams on the redefined days, December 2 (Friday sections) and December 3 (Thursday sections) and December 4 (Wednesday sections).

**Students must report to the FYP office in HELD 412 within two days after the end of an absence to request a make-up lab. This lab is at 6 PM on the date indicated; requests may not be accepted after 3:00 pm the day of the makeup.

*** Students who miss the safety orientation must make this up BEFORE their next lab meeting.