**Syllabus for General Chemistry I (CHEM 161)**

*Spring Term 2016, Section 2, CRN 85087*

Instructor: **Dr. David Cunningham**

Class Meetings: T,R: 09:00 – 10:15 am, PhySci 217

Office Location: Bilger 245B

Email address: TBA

Office Hours: T,R: 10:30-11:30 and as arranged.

Website: TBA

Mastering Chemistry Course ID: UHChem161CunninghamSpr2016

**Mission:**
By the end of this course students will be able to apply the knowledge, concepts and methods covered, to solve original problems as well as those directly solved in-class. Students will endeavor to understand the subject well enough, so that future application of course materials and methods both professionally and academically will require minimal review.

**Educational Philosophy:**
Our #1 Rule is: Don’t Get Stuck!!! Success in Chemistry requires persistent study and problem solving on topics before they are covered in lecture. Most students learn best with a combination of reading, practice problems, homework, lecture, group problem solving and interactive discussion. Memorization of basic information is important, but understanding fundamental principles and how they are related conceptually and mathematically is crucial. You will be required to apply concepts into new contexts. You must study and practice problems consistently and perform well on all evaluations to succeed in this course. Honesty and courtesy are essential elements of this course. If you feel “stuck”, try other resources such as Kahn Academy, You Tube, classmates, Learning Emporium… and do it right away, do not put it off.

**Course Description:**
CHEM 161 - General Chemistry I - University of Hawaii at Manoa
Basic principles of chemistry, including stoichiometry. Introduction to solution phase chemistry. Gas phase chemistry. Thermodynamics, including enthalpies of formation and reaction. Atomic structure, periodic trends, chemical bonding, molecular structure. Pre: C (not C-) in 131 or C (not C-) in 151 or successful completion of placement exam, or consent.

**Required Work Products and their Associated Performance Criteria:**
1. Mastering Chemistry online homework
   a. Problem focused learning, review, and complementary problems
   b. Self-grading, often with hints and helps
c. The course ID is: UHChem161CunninghamSpr2016
d. Evaluation! The cumulative average will be applied to your course grade.

2. Quizzes
   a. Short 1 to 5 question quizzes in class or through Mastering Chemistry. In class quiz questions may be given without notice anytime during class, but will generally be preceded by similar practice problems. Either clickers or Mastering Chemistry’s “Learning Catalytics” smart device interface may be used.
   b. Evaluation! The cumulative score will be applied to your course grade.

3. Exams, excluding Final Exam
   a. Generally multiple choice, and/or short answer
   b. Evaluation! Prepare early, this is a crucial part of your course grade

Ideas for Improved Understanding:
1. Provide peer coaching or peer mentoring to a colleague to help him or her effectively solve interrelated chemistry problems.
2. First skim through each chapter, then carefully read each chapter and section in detail, writing a summary of the key terms, concepts and problem solving approaches.

Resources and Materials:
2. Recommended: General Chemistry laminated chart product(s) as from: Bar Charts, Spark Notes… Should Include periodic table with trends, formulas, constants for formulas, and other useful graphics, information. OR equivalent App, of Web Links (many are free).
3. Learning Emporium (Bilger Addition 209) offers free tutoring:  
4. Chemistry Placement Exam, information:
   http://manoa.hawaii.edu/chem/academics/undergraduate/placement-exam/
5. Override Request:
   http://manoa.hawaii.edu/chem/academics/undergraduate/override-request-form/
6. Final Exam Schedule:
   http://manoa.hawaii.edu/undergrad/schedule/final-exams/spring/
Tentative Agenda:

<table>
<thead>
<tr>
<th>Week</th>
<th>LECTURE</th>
<th>Chapter(s)</th>
<th>NOTES.</th>
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</thead>
<tbody>
<tr>
<td>1 (T) 1/12</td>
<td>Intro, Matter, Measurement and Problem Solving</td>
<td>Intro, 1</td>
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<tr>
<td>2 (T) 1/19</td>
<td>Atoms and Elements, Intro to Molecules</td>
<td>2</td>
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<tr>
<td>3 (T) 1/26</td>
<td>Molecules, Ionic and Molecular Compounds, and Chemical Equations</td>
<td>3</td>
<td>1/19 Last day to drop w/o “W”; 1/20 Last day 100% Refund; 1/29 Last Day 50% Refund</td>
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<tr>
<td>4 (T) 2/2</td>
<td>Chemical Quantities, Aqueous Reactions (Stoichiometry)</td>
<td>4</td>
<td></td>
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<tr>
<td>5 (T) 2/9</td>
<td>Complete Chapters 1-4, and Intro to Gasses</td>
<td>1-5</td>
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<tr>
<td>6 (T) 2/16</td>
<td>Gasses and Review</td>
<td>1-5</td>
<td></td>
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<tr>
<td>7 (T) 2/23</td>
<td>Exam #1 and Review</td>
<td>1-5</td>
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<tr>
<td>8 (T) 3/1</td>
<td>Thermochemistry (Heat, Work, Energy, and Enthalpy)</td>
<td>6</td>
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<tr>
<td>9 (T) 3/8</td>
<td>Quantum Mechanics</td>
<td>7</td>
<td>3/11 4 p.m. Last Day to drop in-person w/ “W”</td>
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<tr>
<td>10 (T) 3/15</td>
<td>Periodic Properties, Trends, and Ground State Electron Configurations</td>
<td>8</td>
<td></td>
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<td>11 (T) 3/22</td>
<td>No Classes – Spring Break</td>
<td>N/A</td>
<td>Spring Break</td>
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<tr>
<td>12 (T) 3/29</td>
<td>Review and Chemical Bonding (Lewis Model)</td>
<td>9</td>
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<tr>
<td>13 (T) 4/5</td>
<td>Chemical Bonds, Molecular Shapes, VSEPR, and Hybridization</td>
<td>9-10</td>
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<tr>
<td>14 (T) 4/12</td>
<td>Chemical Bonds and Review</td>
<td>6-10</td>
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<tr>
<td>15 (T) 4/19</td>
<td>Exam 2 (Tuesday) Chapters 6-10, Review, and Intro Chapter 11</td>
<td>6-10</td>
<td>4/19 Last Exams before Finals</td>
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<tr>
<td>16 (T) 4/26</td>
<td>Liquids, Solids, and Intermolecular Forces</td>
<td>11</td>
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<tr>
<td>17 (T) 5/3</td>
<td>Review for Final</td>
<td>1-11</td>
<td>Review all covered chapters</td>
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<td>18 (R) 5/12</td>
<td>Final Exam</td>
<td>1-11</td>
<td>Thursday 9:45 – 11:45 am (Symbol 12)</td>
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**Evaluation System:**
1. Mastering Chemistry Homework 30%
2. Quizzes 10%
3. Hour Exams (2 exams) 30%
4. Final Exam 30%

Note: Some evaluations may have extra credit problems for a potential >100%, and extra credit points may be awarded for significant contributions toward course mission fulfillment.

**Assessment System:**
Assessment feedback will be provided according to the following:

1. Self and peer review of your performance and understanding of individual in-class problems
2. Self-evaluation of problems from your text book
3. Group and peer evaluation of group activities
4. Self and peer evaluation of practice problems

**Policies and Procedures:**
1. You must be a positive contributor to the class.
2. You must come to the class properly prepared (with readings and assignments completed)
3. Full participation is required.
4. Your work products must be at the highest quality, and submitted on time.
5. Your right to a fair learning environment and cheating:
   If you have ever been in a class where you knew that students were cheating, you know how unfair that was to the other students and how uncomfortable it made you or others. You have the right to learn and be tested in an environment free of cheating! While the professor will work to discourage and punish cheaters, you must do your part. If you know someone is cheating get them to stop or turn them in. When you are part of the solution, you will all have a fair and comfortable learning environment.

6. Academic Policy:
   The consequences of academic dishonesty can include grade reductions, course failure, and even expulsion from the University. Cheating is highly disruptive, I expect students to report any instances of cheating or plagiarism that they observe. I take cheating and plagiarism very seriously!!! I sincerely hope that this is the last time this subject comes up this semester.

Additional information: Academic honesty policies can be found in the UH Student Conduct Code- [http://www.studentaffairs.manoa.hawaii.edu/policies](http://www.studentaffairs.manoa.hawaii.edu/policies). No cell phones or earphones may be used in class during an examination.

Accommodations: The University of Hawaii is an equal opportunity/affirmative action institution, dedicated to teaching all students and reaching all learners. It is our commitment to make our lectures and classrooms accessible to all students. If you have, or think you might have, a disability and have not voluntarily disclosed its nature and the support you need, you
are invited to contact the UH KOKUA Program (http://www.hawaii.edu/kokua/ or (808) 956-7511). Please do this as early in the course as possible.

E-mail and class etiquette: It should be expected that your e-mail questions may take a while for a response, especially at night. Keep current with your studies so your questions can be answered throughout the year as opposed to the last minute before an exam.

Turn cell phones off during class, not silent mode, off. They should remain off for the entire class out of respect for fellow students. If you must leave class early, please sit in the back and be very quiet when you leave to avoid disrupting others when you leave. The instructor reserves the right to remove disruptive student(s). This includes excessive and rude comments, cell phone use, sleeping, eating and drinking in class, etc...

Course Culture and Processes:
The class will include opportunities for student-centered, Process Education activities, which require the learner to take ownership of their own learning. These processes include various forms of assessment (self-assessment, peer assessment, structured reflections, instructor assessment, mid-term assessment, etc.) and specific learning processes such as information processing, critical thinking, and problem solving.

Language development is critical and students will be accountable for new terminology and vocabulary introduced during the class. Students should be able to rephrase definitions to key terms in their own words, and relate concepts to each other. Flash cards and other memorization aids will be helpful.

Personal Benefits of Optional Small Group Work:
By studying and solving problems in small groups you will learn to work cooperatively and effectively in a team environment, while enhancing the scope and perspective of your understanding of chemistry. By presenting correct solutions to others you will exercise your ability to solve the problems yourself. By studying and working problems individually, you will assess your own performance and determine where to focus your study to prepare for exams, and for your own individual educational goals. This course is designed to maximize your understanding of the fundamental concepts of chemistry and their interrelationships. When you are successful at this, you will be able to apply these understandings to your other areas of study and professional work at a more expert and creative level.

This syllabus is a guide. It does not constitute a contract and is subject to changes. Nothing in this syllabus supersedes University of Hawaii or department policy. It is your responsibility to be aware of all posted syllabi revisions, and university academic and disciplinary policy.