CHEM 1411 General and Quantitative Chemistry I

Facility contact:
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Office Hours: MWF 10:00-11:00 am

Introduction: General and Quantitative Chemistry I. 4 Semester Hours: 2.5 hours of lectures and 4 hours of laboratory per week. This course is part of the University Studies core courses and will meet criteria for laboratory science credits.

Supplemental instruction (SI): Students can attended tutoring sessions with tutors in the JAMP room, they usually run for two hours every day. Students sign-in to get credit. Full participation of 5 hours a week for 15 weeks will earn 5% extra credit for the course.

Objectives: This is the first part of a two-course sequence of general chemistry. This course is designed primarily for the students majoring in sciences or in pre-professional programs. By the end of the course, students will be familiar with the concepts of atomic and molecular structure, chemical formulas, reactions, equations, thermodynamics, quantum theory, electron configurations, periodicity, chemical bonding, and reactions of gases, liquids and solids. Chemists deal with these topics every day, but these concepts are also crucially important to other branches of science.

Learning Outcome:
1. Use conversion factor to convert one unit to another unit.
2. Write the name and formula for ionic compounds and binary molecular compounds.

Course Materials:
A pair of safety goggles and a padlock
Classroom: Lecture M/W/F 1:00–1:50 am in AGIT253
Laboratory: Sections 01L and 02L, Monday 2:00 – 5:50 pm, Science 310 and 311.
Laboratory: Sections 03L and 04L, Wednesday 6:00 – 9:50 pm, Science 310 and 311.
Laboratory: Sections 05L and 06L, Wednesday 2:00 – 5:50 pm, Science 310 and 311.
Laboratory: Sections 07L, Monday 9:00 – 12:50 pm, Science 310.
Laboratory: Sections 09L and 10L, Wednesday 9:00 – 12:50 pm, Science 310 and 311.
Laboratory: Sections 12L, Thursday 2:00 – 5:50 pm, Science 311.

Prerequisite: The student must have completed Math 141 or be concurrently enrolled in math 142 or other higher level courses in mathematics. Students who had adequate high school preparation in mathematics or were exempted from Math 141 will be allowed to enroll with the instructor's consent. Concurrent enrollment of Math 141 with CHEM 1411 generally is not encouraged. Students who are currently enrolled in math remediation courses such as PJCM 300, PJCM 306, or Math 131 will not be eligible for enrollment in CHEM 1411.

Attendance Policy: All students are expected to attend classes on a regular basis. The Department of Chemistry adheres to the attendance policy set by the University as stated in the
most current Undergraduate Catalog. The attendance record is taken from the daily sign-in sheet. A student who is late by more than 5 minutes or fails to sign the sign-in sheet will be counted as missing a lecture. **Excessive absence is defined as missing more than 10% of the lectures or more than 10% of the laboratory sessions without excusable reasons.** Excessive absence will be reported to the Dean of the College and the Dean of Students. In addition, **according to the TAMU-Commerce Procedure A13.02, if a student has excessive absences, the instructor may drop the student from the course.** The instructor will only excuse an absence if the student provides, with appropriate document, an excusable reason allowed by the TAMU-Commerce Procedure A13.02. Good class attendance will be necessary in order to pass this course.

**Student Conduct Policy:** All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment (see Student’s Guidebook, Policies and Procedures, Conduct). Any student engaging in disruptive behavior will be dismissed from class on the first offence. A second offence may constitute dismissal from the course with a failing grade.

**Cheating and other Breaches of Academic Conduct:** Academic cheating, plagiarism, and other forms of academic misconduct may result in removal of the student from class with a failing grade or may in extreme cases result in suspension or expulsion from the University as described in the Code of Student Conduct section of the Student’s Guidebook.

**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 have a disability requiring an accommodation, please contact: Office of Student Disability Resources and Services, Texas A&M University-Commerce, Gee Library Room 132, Phone (903) 886-5150 or (903) 886-5835, Fax (903) 468-8148 StudentDisabilityServices@tamu-commerce.edu

**Pointers to Succeed in CHEM 1411:**

1. The lectures in this course will cover topics from Chapters 1 through 11 of the assigned textbook. This material will be covered at the rate indicated by the **Tentative Class Schedule. Be sure to read the textbook before coming to the lectures.** The lectures will focus on important chemistry concepts but will not serve as a substitute for reading the textbook. The textbook is a more detailed presentation with a more extensive set of example problems. Chemistry is a physical science and it is imperative to master calculations to pass the course.

2. **Finish your homework promptly.** Even though the homework is not turned in or graded, working the problems will help you succeed in the course. The more problems that you work the better prepared you will be for exams.

3. **Read the experiment carefully before coming to lab.** A Pre-Lab assignment will be due at the beginning of each laboratory session. The Pre-Lab will be graded and account for 25% of the total lab grade. Therefore, it is necessary to read and understand the concepts as well as the procedure involved in the experiment carefully beforehand. The lab report is due at the beginning of the next laboratory session.
4. Be professional. 5% of the lab grade is dependent on your behaviors in the lab, such as adherence to the safety rules, keeping your bench neat during the laboratory and cleaning up your laboratory area throughout the lab period.

**Grading/Evaluation**

The grade for this course will be derived as follows:

**CHEM 1411: Lecture and Laboratory (graded as a single 4-credit hour course.)**

Lecture Portion: 75% of course grade

- Four examinations: 50% of lecture grade
- Final Exam: 25% of lecture grade
- Supplemental instruction: 5% extra credit

*Late work will not be accepted, and makeup quizzes or exams will not be given.* If you miss an exam, for whatever reason, the points for the missed exam will be placed on your final exam, making your final exam count for a greater percentage of your grade. The final exam will be comprehensive and cover material from Chapters 1-11. Grading will be based on a scale: 100-90 = A; 89-80 = B; 79-70 = C; 69-60 = D; 59-below = F. Dishonest scholarship will earn an automatic zero (0) and initiate prosecution to the fullest extent. Incomplete grades may be given only if the student has a current average ≥70% and is precluded from completion of the course by a documented illness or family crisis.

Laboratory Portion: 25% of course grade. Twelve laboratory reports will be required. The lab report with the lowest score will be dropped. The average of the grade for the rest of the eleven laboratories will constitute the laboratory grade.

- Prelab: 25%
- Conduct, lab cleanliness: 5%
- Lab report: 70%
- Total: 100%

**Tentative Lecture Calendar**

<table>
<thead>
<tr>
<th>Week starting</th>
<th>Chapter</th>
<th>Topics</th>
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<tbody>
<tr>
<td>Aug. 27</td>
<td>Chapter 1</td>
<td>Introduction/Basics of Chemistry</td>
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<tr>
<td>Sept. 3</td>
<td>Chapters 1</td>
<td>Basics of Chemistry, Atomic and Molecular Structure</td>
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<tr>
<td>Sept. 10</td>
<td>Chapters 2</td>
<td>Atomic and Molecular Structure/Chemical Equations</td>
</tr>
<tr>
<td>Sept. 17</td>
<td>Chapter 3</td>
<td>Chemical Equations and Formulas/Review</td>
</tr>
<tr>
<td>Sept. 24</td>
<td>Chapter 4</td>
<td><strong>Exam 1, Chapters 1-3, Wednesday Sept. 26th,</strong> Chemical Reactions</td>
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<tr>
<td>Oct. 1</td>
<td>Chapters 4 and 5</td>
<td>Chemical Reactions, Gaseous State</td>
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<tr>
<td>Oct. 8</td>
<td>Chapters 5</td>
<td>Gaseous State / Thermochemistry</td>
</tr>
<tr>
<td>Oct. 15</td>
<td>Chapters 6</td>
<td>Thermochemistry/Review</td>
</tr>
<tr>
<td>Oct. 22</td>
<td>Chapter 7</td>
<td><strong>Exam 2, Chapters 4-6, Wednesday Oct. 24th,</strong> Quantum Theory</td>
</tr>
<tr>
<td>Oct. 29</td>
<td>Chapters 7 and 8</td>
<td>Quantum Theory/ Electron Configurations</td>
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<tr>
<td>Nov. 5</td>
<td>Chapters 8</td>
<td>Periodicity/ Ionic and Covalent Bonding (Nov 9-12 ACS meeting)</td>
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<tr>
<td>Nov. 12</td>
<td>Chapter 9</td>
<td>Ionic and Covalent Bonding/Review</td>
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<tr>
<td>Nov. 19</td>
<td>Chapter 9</td>
<td><strong>Exam 3, Chapters 7-9, Friday Nov. 16th</strong> Ionic and Covalent Bonding</td>
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Course Information

Fall 2012

Chapter 10
Molecular geometry and Bonding Theory

Chapter 11
Liquids and Solids /Review

Exam 4, Chapters 10-11, Friday Dec. 7th
Final Exam, Chapters 1-11,

Tentative Laboratory Calendar

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Experiment</th>
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<tbody>
<tr>
<td>1</td>
<td>August 27-31</td>
<td>Check in equipment, Safety lecture &amp; quiz</td>
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<tr>
<td>2</td>
<td>Sept. 4-10</td>
<td>1C. Some Measurements of Mass and Volume</td>
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<tr>
<td>3</td>
<td>Sept. 11-17</td>
<td>1A. Identification of an Unknown Compound</td>
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<tr>
<td>4</td>
<td>Sept. 18-24</td>
<td>2. Isotopes and Mass Spectrometry</td>
</tr>
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<td>5</td>
<td>Sept. 25-Oct.1</td>
<td>3A. The Empirical Formula of an Oxide</td>
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<td>6</td>
<td>Oct. 2-8</td>
<td>3B. Hydrates and Their Thermal Decompositions</td>
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<tr>
<td>7</td>
<td>Oct. 9-15</td>
<td>4B. Ionic Reactions in Aqueous Solutions</td>
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<tr>
<td>8</td>
<td>Oct. 16-22</td>
<td>5A. Boyle’s Law and the Empty Space in Air</td>
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<td>9</td>
<td>Oct. 23-29</td>
<td>5B. The Decomposition of Potassium Chlorate</td>
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<tr>
<td>10</td>
<td>Oct. 30-Nov.5</td>
<td>6. Thermochemistry and Hess’s Law</td>
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<tr>
<td>11</td>
<td>Nov. 6-12</td>
<td>7. The Absorption Spectrum of Cobalt(II) Chloride</td>
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<tr>
<td>12</td>
<td>Nov. 13-19</td>
<td>8. Solubility Within a Family</td>
</tr>
<tr>
<td>13</td>
<td>Nov. 26-30</td>
<td>9A. The Identity of an Insoluble Precipitate</td>
</tr>
<tr>
<td>14</td>
<td>Dec. 3-7</td>
<td>Laboratory Check-Out, Return Equipment to Stockroom</td>
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Recommended HW problems and examples

Chap 1: 1.22, 1.24, 1.26, 1.28, 1.32, 1.34, 1.36, 1.42, 1.52, 1.54, 1.56, 1.58, 1.60, 1.62, 1.72, 1.78, 1.92, 1.114, 1.122, 1.138
Chap 2: 2.22, 2.24, 2.26, 2.30, 2.36, 2.46, 2.48, 2.52, 2.64, 2.72, 2.74, 2.80, 2.92, 2.108, 2.118
Chap 3: 3.14, 3.16, 3.18, 3.22, 3.26, 3.30, 3.34, 3.36, 3.40, 3.44, 3.46,
Chap 3: 3.50, 3.58, 3.70, 3.74, 3.90, 3.106
Chap 4: 4.18, 4.24, 4.26, 4.28, 4.32, 4.34, 4.38, 4.42
Chap 4: 4.46, 4.54, 4.58, 4.60, 4.66, 4.72, 4.78, 4.80, 4.86, 4.96, 4.98, 4.104, 4.110, 4.112
Chap 5: 5.24, 5.28, 5.32, 5.34, 5.38, 5.40, 5.44, 5.46, 5.52, 5.60, 5.64, 5.70
Chap 5: 5.82, 5.92, 5.94, 5.110, 5.128
Chap 6: 6.26, 6.28, 6.34, 6.36, 6.38, 6.40, 6.42
Chap 6: 6.44, 6.48, 6.52, 6.56, 6.58, 6.62, 6.68, 6.70, 6.72, 6.78, 6.84, 6.90, 6.102
Chap 7: 7.24, 7.30, 7.32, 7.34, 7.36, 7.38, 7.40, 7.44, 7.50, 7.52, 7.62
Chap 7: 7.64, 7.68, 7.74, 7.78, 7.82
Chap 8: 8.34, 8.36, 8.38, 8.46
Chap 8: 8.50, 8.56, 8.64, 8.68, 8.74, 8.76, 8.80
Chap 10: 10.20, 10.28, 10.30, 10.32, 10.36, 10.40, 10.46, 10.50, 10.54, 10.62, 10.64, 10.66