



**HOUSTON COMMUNITY COLLEGE NORTHWEST**  
**COURSE OUTLINE FOR CHEM 1411 – GENERAL CHEMISTRY I**  
**Fall 2015**  
**Class Number 74140**

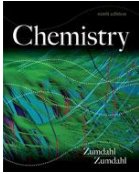

<b>Discipline/Program</b>	Chemistry
<b>Course Level</b>	First Year (Freshman)
<b>Course Title</b>	General Chemistry I
<b>Course Rubric and Number</b>	CHEM 1411
<b>Semester with Course Reference Number (CRN)</b>	Fall 2015 CRN 74140
<b>Course Location/Times</b>	8:00 AM – 11:00 AM Mon (lecture,----- ), Wed (lab or lecture,----- ); Spring Branch Campus
<b>Course Semester Credit Hours (SCH) (lecture, lab)</b>	4 (3 lecture, 3 lab)
<b>Total Course Contact Hours</b>	96
<b>Course Length (number of weeks)</b>	16
<b>Type of Instruction</b>	In-person
<b>Instructor contact information (phone number and email address)</b>	Dr. Mohammad Ali E-mail: Mohammad.Ali@hccs.edu Learning Web: <a href="http://learning.hccs.edu/faculty/mohammad.ali">http://learning.hccs.edu/faculty/mohammad.ali</a>
<b>Office Location and Hours</b>	
<b>Course Description: ACGM or WECM</b>	General principles, problems, fundamental laws, and theories. Course content provides a foundation for work in advanced chemistry and related sciences.
<b>Course Description: HCC Catalog Description</b>	Science and engineering majors study atomic structure, chemical reactions, thermodynamics, electronic configuration, chemical bonding, molecular structure, gases, states of matter, and properties of solutions. Core Curriculum Course. Note: Only one of CHEM 1305, CHEM 1405, and/or CHEM 1411 can be used toward associate degree natural science requirements. Only one of the three will count as Natural Science core; the others may count as electives in the degree plan.
<b>Course Prerequisite(s)</b>	One year of high school Chemistry; Must be placed into college-level reading (or take GUST 0342 as a co-requisite) and be placed into MATH 0312 (or higher) and be placed into college-level writing (or take ENGL 0310/0349 as a core requisite).
<b>Academic Discipline Program Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. To provide the student a basic and practical understanding of chemistry (formulas, reactions, and calculations) and recognize its relevance in our daily lives.</li> <li>2. To prepare our students to meet with success in higher level chemistry and other science courses when they transfer to four-year universities.</li> <li>3. To prepare our students for professional programs requiring a mastery of General Chemistry and Organic Chemistry, such as Nursing, Medicine,</li> </ol>

	<p>Dentistry, and Pharmacy.</p> <p>4. To enhance class lectures with a meaningful, hands-on laboratory experience involving making measurements, observing reactions, evaluating the results and drawing conclusions with the involvement of lab group or other class members.</p>
<b>Course Student Learning Outcomes (SLO)</b>	<ol style="list-style-type: none"> <li>1. Give names and formulas of elements, ions, and ionic and molecular compounds.</li> <li>2. Categorize, complete, and balance chemical reactions.</li> <li>3. Do chemistry calculations involving reaction stoichiometry and energy changes.</li> <li>4. Relate the properties of electromagnetic radiation (frequency, wavelength, and energy) to each other and to the energy changes atoms undergo which accompany electronic transitions.</li> <li>5. Identify the parts of the periodic table and the trends in periodic properties of atoms.</li> <li>6. Relate the properties of gases with the gas laws and extend the application of these relationships to reaction stoichiometry, gas mixtures, and effusion/diffusion of gases.</li> <li>7. Depict chemical bonding with dot structures and valence bond theory and determine the molecular shapes (geometry) of molecules based on VSEPR and valence bond theory.</li> </ol>
<b>Learning Objectives (Numbering system linked to SLO)</b>	<ol style="list-style-type: none"> <li>1.1. Given the name, identify the formula and charge of positive and negative ions, and vice-versa.</li> <li>1.2. Given the name, write the formula of ionic compounds, binary molecular compounds, and acids, and given the formulas of these types of compounds, name them.</li> <li>2.1. Identify given reactions as combination, decomposition, single displacement, and double displacement.</li> <li>2.2. Starting with the reactants, complete the reaction by writing the reaction products.</li> <li>2.3. Given the reactants and products, balance the equation for the reaction.</li> <li>3.1. Convert amounts in units of mass or volume to moles, and vice-versa.</li> <li>3.2. Given the amount of one substance in a reaction, calculate the amount of the other substances that react and form.</li> <li>3.3. Identify the limiting reactant and excess reactant in a reaction where more than one reactant amount is given.</li> <li>3.4. Determine the amount of the excess reactant that remains as unreacted excess.</li> <li>3.5. Calculate energy changes associated with chemical reactions using Hess's law, standard enthalpies of formation, or calorimetry.</li> <li>4.1. Relate frequency, wavelength, and the speed of electromagnetic radiation.</li> <li>4.2. From the frequency or wavelength of electromagnetic radiation, calculate its energy.</li> <li>4.3. Relate the energy change in the hydrogen atom to its electronic transitions using the Bohr model.</li> <li>4.4. Identify and relate the four quantum numbers that can be associated with electrons.</li> <li>4.5. Write the electronic configurations of atoms and ions, including the box diagram method.</li> </ol>

	<p>5.1. Identify the common regions of the periodic table. Identify by name selected groups of elements in the periodic table.</p> <p>5.2. Using the periodic table, identify the trend (increasing or decreasing in value) of selected properties of atoms such as atomic radius, ionization energy, and electron affinity.</p> <p>5.3. Identify reaction similarities of elements within the same group in the periodic table.</p> <p>6.1. Relate and calculate the pressure, volume, temperature, or amount of gas using Boyle's law, Charles' law, Gay-Lussac's law, Avogadro's law, the combined gas law, and the ideal gas law.</p> <p>6.2. Perform stoichiometry calculations which involve gaseous substances.</p> <p>6.3. Use Dalton's law and Graham's law to perform calculations involving gaseous mixtures and effusion and diffusion of gases.</p> <p>6.4. Explain the assumptions of the kinetic-molecular theory of gases.</p> <p>7.1. Draw the Lewis dot structure of molecules containing two or more atoms.</p> <p>7.2. Based on the dot structure of the molecule, determine its electron domain geometry and molecular geometry based on VSEPR theory.</p> <p>7.3. Given the dot structure, identify the hybridization of and geometry about each atom.</p>
<b>SCANS and/or Core Curriculum Competencies</b>	Reading, Speaking/Listening, Critical Thinking, Computer/Information Literacy
<b>EGLS: Evaluation of Greater Learning Student Survey</b>	At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time, you will be asked to answer a short online survey of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and division chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term.
<b>Course Calendar</b>	<p>Aug. 24 : Chapter 1: Chemical Foundation          Aug. 26: Safety Video: Complete chapter 1</p> <p>Aug. 31: Chapter 2: Atoms, Molecules, and Ions</p> <p>Sep. 02: Complete chapter 2; Chapter 3: Stoichiometry</p> <p>Sep. 09 : Complete Chapter 3</p> <p><b><i>Sep. 14: Expt. 1: Experiment 1- Measuring Techniques and Calculations (prelab questions due before Lab.)</i></b></p> <p>Sep. 16: Chapter 4: Types of Chemical Reactions &amp; Solution Stoichiometry</p> <p><b><i>Sep. 21: Expt. 2: Separation of a mixture (prelab questions due before lab.); Completed lab. 1 due (prelab + report + post lab);</i></b></p> <p><b><i>Expt. 4: Identification of the substance by Physical Properties (prelab questions due before Lab.)</i></b></p>

	<p><b><u>Sep. 23: Exam 1: Chapters 1, 2, 3</u></b></p> <p><i>Sep. 28: Expt. 8- Reactions in aqueous solutions;</i></p> <p><i>Completed Labs. 2,4 due (prelab + report + post lab);</i></p> <p>Sept 30. 1: Complete Chapter 4</p> <p><i>Oct. 5: Expt. 9- Reactivity of metals- Activity Series (prelab questions due before Lab.); Completed Lab. 8 due (prelab + report + post lab);</i></p> <p>Oct. 7: Begin Chapter 5: Gases</p> <p><i>Oct. 12: Complete Chapter 5; Expt. 13- Ideal Gas Law: Determination of the Molar Mass of a Volatile Compound (prelab questions due before Lab. ); Completed Lab. 9 due (prelab + report + post lab);</i></p> <p>Oct. 14: Begin Chapter 6: Thermochemistry</p> <p><i>Oct. 19: Complete Chapter 6; Expt. 11- Heat of Acid-Base Neutralization (prelab questions due before Lab. ); Completed Lab.13 due (prelab + report + post lab)</i></p> <p>Oct. 21: Begin Chapter 7- Atomic Structure And Periodicity</p> <p>Oct. 26: Continue Chapter 7; <i>Completed Lab.11 due (prelab + report + post lab)</i></p> <p><b><u>Oct. 28: Exam 2- Chapters 4-6</u></b></p> <p><b>Oct 30: LAST DAY TO WITHDRAW (BEFORE 4:30 PM);</b></p> <p>Nov. 2: Complete Chapter 7</p> <p>Nov. 4: Chapter 8: Bonding: General Concepts</p> <p>Nov. 6: Complete Chapter 8</p> <p>Nov. 9: Chapter 9: Covalent Bonding: Orbitals</p> <p>Nov. 11: <i>Expt.14: The VSEPR Theory of Molecular Geometry;</i> Complete</p> <p>Nov. 16: Chapter 9: Begin Chapter 10: Liquids and Solids</p> <p>Nov. 18: <i>Expt. 6- Formula of a Hydrate and percentage of water of hydration (prelab questions due before Lab.);</i></p> <p><b><u>Nov. 23: Exam 3- Chapters 7, 8, 9, 10</u></b></p> <p>Nov. 26: Thanksgiving Holiday</p> <p>Dec. 2: Unfinished Topics; Completed Lab. 6 due</p> <p>Dec. 7: Review for Final</p> <p><b><u>Thursday: Dec. 09: Comprehensive (chapters 1-10) Two Hour Final Exam (8 AM-10 AM)</u></b></p>
<b>Instructional Methods</b>	Standard class lectures using the whiteboard with occasional use of

	PowerPoints.
<b>Student Assignments</b>	<p>Outside of laboratory reports, special assignments are normally not required. I will recommend practice problems but these are not graded. Practice problems, such as those at the end of the chapters, are highly beneficial, indeed essential, to learning chemistry. I recommend that you work as many of the even-numbered end of chapter problems as you can (these have answers in the back of your textbook); similar additional problems follow in the "Additional Problems" section. Get a spiral leaf notebook just for working chemistry problems. That will keep your work more organized and you (or I) can easily review your work.</p>
<b>Student Assessment(s)</b>	<p>The overall score is based on the following:</p> <ul style="list-style-type: none"> <li>• Three regular exams 45%</li> <li>• Graded Assignments and Quizzes: 10%</li> <li>• Laboratory 20%</li> <li>• Final Exam 25%</li> </ul> <p>Overall Score = 0.45(Average of three regular exams) + 0.10 (Average of quizzes and assignments) + 0.20(Laboratory grade) + 0.25(Final Exam)</p>
<b>Instructor's Requirements</b>	<p><b><u>Laboratory Policy</u></b></p> <p>Lab safety will be reviewed before the first lab. Each student will then sign a statement affirming his or her commitment to following safe procedures in the laboratory, and turn the form in to the instructor. Be especially aware of the need for adequate eye protection and proper dress in the laboratory. Safety glasses or goggles must be worn at all times during the laboratory period. Normally, experiments will be performed in groups of two students. Students should arrive at the lab on time with their lab manual. After you have finished the experiment, show me your results for me to examine briefly, and I will initial ("MS") your lab report before you leave. Laboratory reports are due on the next lab day. Each report must be done individually, but of course you can work with your lab partners on it. Each report will be graded on a 100-point basis. Come to lab prepared. Read through the experiment beforehand and do the pre-lab questions at the end of the lab report. You will be much better organized when doing the experiments, and your laboratory experience will be much more rewarding!</p> <p><b><u>Exams and Make-up Policy</u></b></p> <p>Examinations will consist of three non-cumulative regular exams (45%), periodic quizzes and graded homework (10%) plus a comprehensive final (25%). Programmable calculators, such as the TI 83 Plus, are not allowed during exams! The department has calculators that you can use on test days if you do not have a "regular" calculator. Make-up exams will not normally be given, so make every effort to take the exams on their scheduled dates. In the event that you must miss a regular exam, I will count the grade made on the final exam as the grade for the missed exam (for one missed exam only), and calculate the final course grade accordingly. If you do not miss any of the regular exams, I will replace your lowest exam score with your final exam score if the final exam grade is higher. This is intended to provide you a "second chance" if you do not do well on a particular exam. Remember that the final exam will be comprehensive (meaning that it will cover all of the material from the whole semester, not just the last part). Please note that all students are required to take the final (no student can be</p>

	exempted).
<b>Program/Discipline Requirements</b>	At the program level, the Chemistry Discipline strives to accomplish the Program Learning Outcomes, Student Learning Outcomes, and Learning Objectives as described above. We desire that you receive a challenging and rewarding experience in your chemistry classes at HCC which will prepare you well for future chemistry and related science courses that you may take in the future.
<b>HCC Grading Scale</b>	<p>A = 100 – 90; .....4 points per semester hour  B = 89 – 80: .....3 points per semester hour  C = 79 – 70: .....2 points per semester hour  D = 69 – 60: .....1 point per semester hour  59 and below = F .....0 points per semester hour  IP (In Progress) .....0 points per semester hour  W(Withdrawn).....0 points per semester hour  I (Incomplete).....0 points per semester hour  AUD (Audit) .....0 points per semester hour</p> <p>IP (In Progress) is given only in certain developmental courses. The student must re-enroll to receive credit. COM (Completed) is given in non-credit and continuing education courses. To compute grade point average (GPA), divide the total grade points by the total number of semester hours attempted. The grades “IP,” “COM” and “I” do not affect GPA.</p>
<b>Instructor Grading Criteria</b>	See the above descriptions of the lab, exams, quizzes, and final. The course grade is based on these four criteria according to the Assessment section above.
<b>Instructional Materials</b>	<p><b><u>Textbook</u></b></p>  <p>Chemistry, The Ninth Edition  Steven S. Zumdahl, Susan A. Zumdahl  ISBN-10: 1133611095  ISBN-13: 9781133611097  © 2014  www.cengage.com/global  www.cengagebrain.com</p> <p><b><u>Laboratory Manual</u></b></p>  <p><b><u>Laboratory Manual for CHEM 1411,</u></b>  Blue Door Publishing: 2011  :ISBN-13: 978-1-59984-380-3</p>

<p><b>HCC Policy Statement:</b>  <b>ADA</b>  <b>Academic Honesty</b>  <b>Student attendance</b>  <b>3-peaters</b>  <b>Withdrawal deadline</b></p>	<p>Access Student Services Policies on their Web site:  <a href="http://hccs.edu/student-rights">http://hccs.edu/student-rights</a></p> <p><b><u>Disability Support Services (DSS)</u></b>  “Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at the respective college at the beginning of each semester. Faculty are authorized to provide only the accommodations requested by the Disability Support Services Office.”</p> <p>If you have any special needs or disabilities which may affect your ability to succeed in college classes or participate in any college programs or activities, please contact the DSS office for assistance. At Southwest College, contact Dr. Becky Hauri, 713-718-7909. Contact numbers for the other HCC colleges are found in the Annual Schedule of Classes, and more information is posted at the HCC web site at <a href="#">Disability Services</a>.</p> <p><b><u>Academic Honesty</u></b>  “Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Disciplinary proceedings may be initiated by the college system against a student accused of scholastic dishonesty. Penalties can include a grade of "0" or "F" on the particular assignment, failure in the course, academic probation, or even dismissal from the college. Scholastic dishonesty includes, but is not limited to, cheating on a test, plagiarism, and collusion.” In <b>this class</b>, the penalty for willful cheating on exams is a <b>grade of F in the course</b>. This is the standard policy of the Physical Sciences department at Southwest College.</p> <p><b><u>Attendance Policy</u></b>  The HCCS attendance policy is stated as follows: “Students are expected to attend classes regularly. Students are responsible for materials covered during their absences, and it is the student's responsibility to consult with instructors for make-up assignments. Class attendance is checked daily by instructors. <i>Although it is the responsibility of the student to drop a course for non-attendance, the instructor has full authority to drop a student for excessive absences. A student may be dropped from a course for excessive absences after the student has accumulated absences in excess of 12.5% of the hours of instruction (including lecture and laboratory time).</i>”</p> <p>Note that 12.5% is approximately <u>4</u> classes or labs for a 4 semester hour course, such as this one, which meets 2 times per week in a 16 week semester. If circumstances significantly prevent you from attending classes,</p>

	<p>please inform me. I realize that sometimes outside circumstances can interfere with school, and I will try to be as accommodating as possible, but please be aware of the attendance policy.</p> <p><b><u>Policy Regarding Multiple Repeats of a Course</u></b>  “NOTICE: Students who repeat a course three or more times may soon face significant tuition/fee increases at HCC and other Texas public colleges and universities. If you are considering course withdrawal because you are not earning passing grades, confer with your instructor/counselor as early as possible about your study habits, reading and writing homework, test-taking skills, attendance, course participation, and opportunities for tutoring or other assistance that might be available.”</p> <p><b><u>Last Day for Administrative and Student Withdrawals</u></b>  For 16-week Fall 2013 classes, this date is <b>November 1</b>. I urge any student who is contemplating withdrawing from the class to see me first! I want to be accessible and supportive. I do not believe in "weed out" classes, and I consider you to be much more than just a name or number! Note my office hours above; if you need assistance, I'm here to help.</p> <p>☞ <b><u>Policy Regarding Withdrawals</u></b> ☞  Students desiring to withdraw from a class must do so by the above withdrawal date by filling out a <b>withdrawal form</b> at the registrar’s office. <i>After this date, instructors can no longer enter a grade of “W” for the course for any reason.</i></p>
<b>Distance Education and/or Continuing Education Policies</b>	<p>Access DE Policies on their Web site:  <a href="http://de.hccs.edu/Distance_Ed/DE_Home/faculty_resources/PDFs/DE_Syllabus.pdf">http://de.hccs.edu/Distance Ed/DE_Home/faculty_resources/PDFs/DE_Syllabus.pdf</a></p> <p>Access CE Policies on their Web site:  <a href="http://hccs.edu/CE-student-guidelines">http://hccs.edu/CE-student-guidelines</a></p>
<b>Test Bank</b>	<p>Extra practice problems by chapter, sample exams, and sample finals may be found at the following web sites:  <a href="http://learning.hccs.edu/faculty/mohammad.ali">http://learning.hccs.edu/faculty/mohammad.ali</a></p>
<b>Scoring Rubrics</b>	<p>Regular exams and the final will consist of multiple-choice and show-work questions. These are graded in the standard manner. The regular exams will include extra questions for extra credit, for a total possible score of about 110 points.</p> <p>The lab reports are graded on the basis of completeness, neatness, and the correctness of the calculations tied to the experimental result. The pre- and post-lab questions are also checked. Each report is graded on a 100 point basis.</p>
<b>Sample Assignments</b>	<p>N/A</p>
<b>Sample Instructional Methods/Activities</b>	<p>See the PowerPoints at my Learning Web site for an overview of the content of each chapter:</p>



	<a href="http://learning.hccs.edu/faculty/mohammad.ali">http://learning.hccs.edu/faculty/mohammad.ali</a>
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