1. COURSE TITLE, NUMBER, AND SECTION:
Chemistry for Engineers, CHEM 1410-311
Lecture Mon-Fri 9:30 – 11:30 AM Room: H207
Lab: Mon-Fri 11:40 AM – 1:35 PM Room : S218

2. INSTRUCTOR INFORMATION
INSTRUCTOR: Dr. Lee Jennings
Email: lee.jennings@blinn.edu Preferred method of contact.
Office Hours: Thur: 9:00 – 9:30 AM and Fri: 9:00 - 9:30 AM
Office: S117

Course Description: CHEM 1410 is a course designed for engineering majors that incorporates the major concepts and principles of both CHEM 1411 and CHEM 1412. Applications of these principles will be emphasized. The major areas which will be covered are: matter and energy relationships, structure of matter, chemical bonding, gases, liquids and solids, solutions, acids and bases, oxidation-reduction, electrochemistry, thermodynamics, kinetics, and chemical equilibrium.

Prerequisites: MATH 1314 with a grade of 'C' or better or an SAT math score of 550 or higher or an ACT math score of 22 or higher.

Core Curriculum Course: This is a course in the 42-hour Core Curriculum of Blinn College. As such, students will develop proficiency in appropriate intellectual competencies, educational objectives and general perspectives. The URL of the Blinn College core curriculum website is: http://www.blinn.edu/academics/core_curriculum.html

Course Objectives and Student Learning Outcomes:
Students who complete this course should gain an understanding of the topics listed in the course description and should be able to analyze, evaluate and solve problems related to those topics. Students should also be able to safely perform basic skills needed to investigate the course topics in laboratory. At the completion of the course, the student will be able to:

1. Classify atoms, molecules and compounds
2. Describe the characteristics of matter, measurements, and calculations in chemistry.
3. Understand the atomic nature of matter: electrons and nuclei, the elements, ions.
4. Demonstrate the representation and naming ionic and molecular compounds
5. Demonstrate the mole concept of matter, mass-mole conversions, determining chemical formulas, aqueous solutions.
6. Interpret chemical equations to determine yields of chemical reactions, percent yields, the limiting reactant, excess reactants, and reactions involving solutions.
7. Discuss the behavior of both ideal and real gases and reactions involving gases.
8. Understand the properties of electrons, quantum theory and quantum numbers, shapes of atomic orbitals, and chemical periodicity.
9. Discuss ionic and covalent bonding, electronegativity and polarity.
10. Draw Lewis structures and use VSEPR theory and Valence Bond theory to describe molecules.
11. Summarize the properties and behavior of solids and liquids.
12. Describe the energy changes of chemical reactions.
13. Illustrate how energy, entropy and free energy affect the spontaneity of chemical processes.
14. Understand the field of chemical kinetics applied to reaction mechanisms and rates of reaction.
15. Demonstrate the principles of chemical equilibrium.
16. Describe the different types of electrochemical cells.

Textbooks and Other Materials:
Homework: Online Web-Based Learning (OWL) access code.
   http://owl.cengage.com/owl-c/register/owlmgr.cgi
Safety glasses with side shields
Non programmable calculator. Scientific or graphing calculator is acceptable.
Laboratory Resources: All labs must be downloaded from my website and brought to class.
   https://www.blinn.edu/brazos/natscience/chem/jennings/
An apron or lab coat will be required in laboratory if your shorts or skirt do not cover your knees while standing.

Civility Statement:
Members of the Blinn College community, which includes faculty, staff and students, are expected to act honestly and responsibly in all aspects of campus life. Blinn College holds all members accountable for their actions and words. Therefore, all members should commit themselves to behave in a manner that recognizes personal respect and demonstrates concern for the personal dignity, rights, and freedoms of every member of the College community, including respect for College property and the physical and intellectual property of others.

Civility Notification Statement:
If a student is asked to leave the classroom because of uncivil behavior, the student may not return to that class until he or she arranges a conference with the instructor. It is the student’s responsibility to arrange for this conference.

Course Requirements and Policies:
Absences A severe personal problem such as illness or a death in the family may, with adequate documentation, warrant special academic consideration during the ongoing term for making-up certain work or turning in certain materials late. However, the difficult situation is not in itself an excuse for failure to meet the course requirements. If such a situation arises it is the student’s responsibility to inform the instructor immediately of the situation and the surrounding circumstances. Supportive documentation must be provided regardless of the circumstances. Make-up work may or may not be given for unexcused absences. The instructor does not provide copies of missed notes to students.

Reading is a requirement. Lectures and readings are designed to help you develop an understanding of the material being emphasized. Sometimes I will ask you to read material before you come to class and other times after a lecture is delivered. Please pay attention to announcements in class as to where you should be with the readings.

Homework is a requirement. There will be 10 assignments due during the semester worth 5 points each set (50 pts. maximum). Homework is assigned by the instructor and is available to students on the Online Web-Based Learning (OWL) System, http://owl.cengage.com. A code must be purchased in order to access this system. Further instructions are given at the website. The deadline for each weeks’ homework assignments is 5:00 PM Friday.
Exams are a requirement. There will be 4 exams worth 100 points each as indicated in the attached schedule. Each of the exams will include all of the material covered through that stage of the course, i.e., all exams are comprehensive. The lowest of the four exam grades will be dropped. Format of the exams will vary. Make up exams will be allowed in exceptional situations at the instructor’s discretion, but only if taken before the graded exam is returned to the class. The final exam is comprehensive, all multiple-choice and worth 150 points.

Laboratory Experiments are a requirement. The laboratory portion of this course counts for 25% of the total course grade. Laboratory instructions and report forms are downloaded from the instructor’s website at https://www.blinn.edu/brazos/natscience/chem/jennings/ and brought to class.

The Lab Report must reflect information obtained by you while in the laboratory and recorded, at the students’ option, in a lab notebook or a spiral notebook. A Lab Report consists of the completed report form and attached sheets showing calculations made. Neatness and completeness of your lab report and calculations may be considered when points are assigned. Lab Reports must be turned in individually (i.e. each student must turn in an assignment) and are due the day of the next Unit Exam (usually Friday). One lab may be turned in late for full credit.

Quizzes are a requirement. There will be four quizzes given. Quizzes will be given at irregular intervals at the beginning of Lecture and announced by the instructor. There will be no makeup offered for quizzes.

Eye protection in the laboratory is a requirement. Students are responsible for purchasing and correctly wearing appropriate eye protection during the lab period. Appropriate eye protection for this class will be safety goggles or OSHA approved safety glasses with side shields. Students must wear approved eye protection and closed toed shoes any time chemicals or equipment are being moved by anyone in the laboratory. Failure to wear eye protection or appropriate footwear will result in expulsion from the laboratory for the experiment involved.

Grading Criteria: Grades will be calculated in the following manner:

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<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Exams (3 exams @ 100 pts. ea.)</td>
<td>300</td>
</tr>
<tr>
<td>Comprehensive Final</td>
<td>150</td>
</tr>
<tr>
<td>Homework (10 @ 5 pts. ea.)</td>
<td>50</td>
</tr>
<tr>
<td>Experiments (11 reports @ 16 pts. ea.)</td>
<td>176 pts.</td>
</tr>
<tr>
<td>Quizzes (4 @ 10 pts. ea.)</td>
<td>40</td>
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<tr>
<td><strong>Total Course Points</strong></td>
<td><strong>716 pts.</strong></td>
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The grading scale will be:

- Course Grade ≥ 90 % = A
- Course Grade ≥ 80 % = B
- Course Grade ≥ 70 % = C
- Course Grade ≥ 60 % = D
- Course Grade < 60 % = F
Blinn College Policies:

Attendance  The College District believes that class attendance is essential for student success; therefore, students are required to promptly and regularly attend all their classes. Each class meeting builds the foundation for subsequent class meetings. Without full participation and regular class attendance, students shall find themselves at a disadvantage for achieving success in college. Class participation shall constitute at least ten percent of the final course grade. It is the responsibility of each faculty member, in consultation with the division chair, to determine how participation is assessed in his or her class. Faculty will require students to regularly attend class and will keep a record of attendance from the first day of class and/or the first day the student’s name appears on the roster through final examinations. If a student has two absences during the semester, he/she will be sent an e-mail by the College, via their Blinn e-mail account, requiring the student to schedule a conference with his/her instructor to discuss his/her attendance issues. Should the student subsequently accumulate four unexcused absences, he/she will be administratively withdrawn from class. There are four forms of excused absence officially designated by Blinn College: (1) Observance of religious holy days: The student should notify his/her instructor(s) not later than the 15th day of the semester concerning the specific date(s) that the student will be absent for any religious holy day(s); (2) Representing Blinn College at an official institutional function; (3) official involvement in a high school activity for “dual credit” students; and (4) military service. Other excuses will be considered and may be considered excusable at the instructor’s discretion, with documentation. Missing lecture or lab or both will count as one absence.

Dropping  If a student chooses to drop the course, it is that student’s responsibility to complete a drop order at the Office of Enrollment Services. Failure to do so could result in a grade of F in the course. The last day to withdraw with a “Q” is Friday, July 27.

Eating and drinking  are not allowed in classrooms or laboratories.

Dishonesty Statement  Blinn College does not tolerate cheating, plagiarism or other acts of dishonesty. Definitions of these acts and procedures for dealing with them are described in “Scholastic Dishonesty” in the Blinn College Student Handbook, copies of which are available at the information desk in the administration building.

ADA Statement  Students with physical or learning disabilities must present documentation from the Office of Disability Services to receive accommodation on exams and assignments. Accommodation is not retroactive.
<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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</table>
| **July 9** Chapter 2 Atoms and Molecules  
Safety Video / Quiz | **July 10** Chapter 3 Moles & Equations  
Density Lab | **July 11** Chapter 4 Stoichiometry  
% Copper in a Compound Lab | **July 12** Chapter 5 Gases | **July 13** Unit 1 Exam |
| **July 16** Chapter 5/6  
Titration Lab | **July 17** Chapter 6 Atomic Structure  
Gas Laws Lab | **July 18** Chapter 7 Molecular Structure  
Periodic Behavior of Metals Lab | **July 19** Chapter 8 Molecules & Materials  
Tutorial | **July 20** Unit 2 Exam  
Electron Configuration Worksheet due |
| **July 23** Chapter 8/9  
Molecular Models Lab | **July 24** Chapter 9 The 1st Law of Thermodynamics  
Calorimetry Lab | **July 25** Chapter 10 The 2nd Law of Thermodynamics  
Rate of Reactions Lab | **July 26** Chapter 11 Chemical Kinetics  
Tutorial | **July 27** Unit 3 Exam  
‘Q’ Drop Deadline |
| **July 29** Chapter 11 Chemical Kinetics  
Kinetics Lab | **July 30** Chapter 12 Chemical Equilibrium  
Electrochemistry | **Aug 1** Chapter 13 Electrochemistry  
Electrochemistry | **Aug 2** Unit 4 Exam | **Aug 3** Review for Final |
| **Aug 5** Final Exam | | | | |

denotes a ‘wet’ lab day. Come prepared with shoes and goggles.