Course Goals: To understand the introductory fundamentals of chemistry; these fundamentals include:

- Review of polarity and dipole moments (chapter 7.2, 7.3)
- Intermolecular Forces and how they affect solutions (chapter 12.1, 12.2, 13.1, 13.2)
- Solutions (Chapter 13.3, 13.4, 13.5, 13.6, 13.7)
  - Various Methods for defining solution concentrations
  - Factors that affect solubility
  - Colligative properties and calculation using these properties
  - Colloids.
- Chemical Equilibrium (Chapter 15.1, 15.2, 15.3, 15.5, 15.6) exclude 15.4
  - Reaction Quotient vs. Equilibrium Constant
  - Homogeneous vs. Heterogeneous Equilibrium
  - Calculating Equilibrium Expressions
  - Le Chatelier’s Principle
- Acids and Bases (Chapter 16.1, 16.2, 16.3, 16.4, 16.6, 16.7, 16.8, 16.9, 16.10, 16.11, 16.12)
  - Bronsted Acids and Bases
  - Molecular Structure and Acid Strength
  - Water as an acid/base
  - pH and pOH
  - Strong Acid and Bases
  - Weak Acid and Bases
    - Calculations of Dissociation (Ionization Constant)
    - Calculations of pH and or pOH
  - Conjugate Acid Base pairs
  - Relationship between acid and base ionization constants
  - Di and polyprotic acid
  - Acid/Base properties of
    - Salts
    - Oxides
    - Hydroxides
  - Lewis Acids and Bases
- Acid-Base Equilibria (Chapter 17.1, 17.2, 17.3)
  - Common Ion Effect
  - Buffers
  - Acid-Base Titrations
    - Indicators
- Solubility Equilibria (Chapter 17.4, 17.5, 17.6)
  - Predicting Precipitation
  - Factors affecting solubility
    - Complex Ion Formation
These topics are covered in Chapters 7, 12, 13-20 in your book. Please note that we do not cover these exactly in order so you should refer to the excel spreadsheet with topics, dates and homework for each of the topics.

After completing this course, you should have a strong foundation for upper level courses in the Chemistry Department. We hope also that as part of this learning community that you will understand better the connections between the study of chemistry and how it relates to other scientific areas.

Student Learning Outcomes:

- Demonstrate competency with all of the learning objectives stated for Chem 111 and Math 111
- Apply common mathematical techniques to describe the kinetic and thermodynamic processes related to chemical equilibria
General Education Learning Outcomes:

- Students will be able to apply physical/natural principles to analyze and solve problems.
- Students will develop an understanding of the impact that science has on society.

General Education Learning Outcomes are assessed at the end of this class and the method will be announced. The assessment of these Gen Ed learning outcomes will be worth 5% of your grade.

Pre-requisite: A passing grade in Chemistry 111 (students with a D in Chemistry 111 are recommended to retake that course)
Co-requisite: Chemistry 112 Lab, which is a separate one-hour course.

Texts:
1) Required: Burdge and Overby, *Chemistry: Atoms First* (McGraw-Hill) 2nd edition. For online registration of the Connect Database use the following:
2) Learn Smart Prep, this module which must be purchased separately from the textbook (see instructions on the web and in the e-mail) counts for 5% of your final grade and must be completed by **August 31 (11 PM)** and is a requirement for the course.

**Calculator:** You will need a calculator for exams. You will need to bring this calculator to class.

**Course Expectations:**

A. **Attendance**
   Class attendance is mandatory with 4 allowed absences during the total semester. With extremely small exception, performance in the course is directly proportional to attendance. Students are responsible for all information presented in class whether they are present or not. Students
should obtain notes from a classmate, read the associated material in the
text, and then come ask me questions
Please note that an Absence Memorandum from the Office of Undergraduate
Studies only verifies your documentation for missing a class. It does not
entitle you to make up or be excused from any work, assignment or test.

B. Responsibilities
You are accountable for all material covered or assigned in class. You are
expected to spend a minimum of 3 hours of study for every hour spent in
lecture. The instructor is here to explain the material and help you to the best
of his time and ability. However, the burden of learning is upon you, the
student.

C. Disabilities
If there is a student in this class who has a documented disability and has
been approved to receive accommodations through SNAP Services, please
feel free to come and discuss this with me.

D. Academic Integrity
One of the core values of the College is academic integrity. This course is
conducted under the Honor Code (http://www.cofc.edu/StudentAffairs/general_info/honor_system/index.html)
of the College of Charleston. Students at the College are bound by honor and
by their acceptance of admission to the College to abide by the Code and to
report violations. Faculty members are required to report violations of the
Honor Code or Code of Conduct to the Office of Student Affairs. Conviction
of an Honor Code violation in this class will result in the grade of "F" for the
course. Please consult the department's Policy on Scientific Integrity
(http://www.cofc.edu/~chem/advising/integrity.html).

E. Email
Email is considered an official method for communication at the College of
Charleston. College of Charleston email accounts are automatically assigned
to all students upon acceptance at the College. If a student wishes to have
email redirected from their official College issued account to another email
address (e.g. @aol.com, @hotmail.com, @yahoo.com, or any other server
other than the official @g.cofc.edu), they may do so, but at their own risk.
Having email redirected does not absolve the student from the responsibilities associated with official communication sent to his or her College account. The College is not responsible for the handling of email by outside vendors or unofficial servers. A link to instructions on how to forward Edisto email can be found by clicking on Web Mail from the CofC home page. Students are expected to check their College of Charleston official email on a frequent and consistent basis in order to remain informed of College related communications. Checking email on a daily basis is recommended. Students have the responsibility to recognize that certain communications may be time-critical. “I didn’t check my email”, error in forwarding email, or email returned to the College with “Mailbox Full” or “User Unknown” are not acceptable excuses for missing official College communications via email.

F. Course Materials: Some course materials will be available to students on OAKS. You will need to take careful lecture notes.

G. Homework:  *The key to success in this class is doing chemistry problems again and again. If you are not working out problems every single day, you will not do well in this class. This class is very problem solving centric so doing assignments is critical.* Required homework packets will be assigned prior to class on OAKS and will be required to be handed in one week after they are assigned. Homework assignments must be legible and clearly show all work. You will be expected to work through problem sets assigned as well as the end-of-chapter questions. The assigned problem sets will be graded and this grade will comprise 10% of your overall grade.

H. Hourly Exams
The following are tentative dates for the exams. **These dates are subject to change.** There are 4 hourly exams and a Final. The material covered on each exam will be announced in class one week prior to the exam.
Wednesday, September 14
Wednesday, October 5
Wednesday, November 2
Wednesday, November 30
Final Exam: To Be Scheduled. Your final is a standardized exam written by the American Chemical Society. It is a **TIMED, multiple choice** test. You will have 110 minutes to complete the 70 multiple-choice questions.

Makeups: There are **NO** makeup tests. An unexcused absence on the day of an exam will result in a zero on that exam. If you have an **excused** absence that I find plausible, your remaining test scores will all be weighted equally and more heavily towards the final course grade to compensate for the missed exam. If you are going to miss an exam, **notify me ahead of time** by phone message or by email and we will try to find an equitable way to get the exam taken at a mutually agreed to time.

Even if you have a good excuse, you may not miss more than one exam. You will be dropped from the roll for excessive absences if you miss more than one exam.

Supplemental Instruction and Tutoring: This learning community will have an SI for the course that is responsible for provide additional instruction of the chemistry content. Our SI is **TBD**. The SI will be arranging a variety of times when he/she will be available to work through problems with you. Your attendance is not required, but data has shown that students who attend regularly do better in the course. Also, tutoring at the Center for Student Learning in chemistry is available to students at no cost. The hours of the walk-in science tutoring room are available online (http://csl.cofc.edu/labs/).

Deportment:
To maintain a classroom environment that is conducive to learning, I expect certain adult behavior from students in my classes. There will be no cell phone use, no distracting behavior and all students should display attentive learning modes during the lecture.

Grading:
Your final grade will be calculated by the following formula:

- **4 Exams:** (Each at 15%) \[ 60\% \]
- **Final Exam, ACS Standard Exam** 20% \[ 20\% \]
- **Required Homework** 10%
- **General Ed Assessment** 5%
- **Learn Smart Prep 5% (done by 8/31)** 5%
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