

Chemistry 115 General Chemistry I: Essential Concepts of Chemistry
Sections 1-6 Spring 04 MWF 9:10 - 10 am, Sci 101 3 unit lecture, 2 unit lab

Instructor: Dr. Jane DeWitt TH 724 338-1895 dewitt@sfsu.edu

Office hours: TH 724 M,F 10:15 – 11:30; W 1:00 – 2:00; by appointment and by email.

Course Prerequisites: 550 or above (old scale) or 50 or above (new scale) on ELM or approved exemption, or C in Math 70, **and** satisfactory score on chemistry placement exam given at the first lab meeting of the semester.

Materials Required for the Course: Textbook: *Chemistry*, McMurry and Fay, 4th Edition
Calculator A scientific calculator with logarithms, exponential operations and scientific notation.
Required for the Laboratory (1) Chemistry 115 laboratory manual (available at bookstore), (2) Laboratory notebook with carbonless copies, (3) chemical splash goggles. The Chemistry and Biochemistry Student Association will be coming to lab to sell lab notebooks and comfortable splash goggles during the first few weeks of class. These items are also available at the bookstore.

Chemistry Placement Exam: The placement exam is administered during the laboratory on Wednesday January 28 and Thursday January 29. **ALL** students **must** attend lab on one of those two days and take the exam. There are **NO EXCEPTIONS**. Students who are registered with the DPRC and need accommodations for the placement exam should have notified the Department Chair by January 22, 2004. **ATTEND LAB** until the results of the placement exam are known, as missed lab work can not be made up. Placement exam results will be posted on the **lab website** (see below) and on the bulletin board across from SCI 101 by 5 pm on Friday, January 30. The cutoff for the placement exam is 15 correct answers. Students who do not pass the placement exam should enroll in Chem 100 this semester and take Chem 115 next semester.

Students who are pass the placement exam but do not attend lab on **February 2nd, 3rd or 4th, 5th** will lose their place in class unless they have notified me in advance about their absence. Add permits will be handed out in lab on those dates.

Course Websites:

Lecture online.sfsu.edu/blackboard/access.html select Chem 115
Lab joule.sfsu.edu/dewitt/chem115lab/private username: chem115lab password: beaker
OWL owl.oit.umass.edu/studentlogin.html On-line graded homework

Weekly Time Commitment: For a 3 unit lecture course, the expectation is that students spend a minimum of 10 hours per week on the course, attending lecture, doing the reading and homework assignments, other studying for the course and attending office hours or tutor hours. This does not include the lab or lab preparation.

Preparing for Lecture Break this course down into little blocks. For each lecture, read the section of the text that will be discussed in lecture and do the homework problems associated with that section. Write down any questions on the material for lecture or office hours. Attend lecture and take notes. After lecture, review the lecture notes and add any details that come to mind. Review the questions from the reading to see if the lecture answered them. Attend office hours – instructor office hours or lab instructor's office hours, or see a tutor in the Chemistry Tutoring Center and get the questions answered.

Chemistry Tutoring Center: Chem 115 tutors are available in TH 408, T-F from 11 – 2. The tutor center opens on February 3rd. Tutors are there to answer any questions and explain any information. Additionally, the Tutor Center will be featuring a topic of the week so even if you don't know what question to ask, you can always stop by and ask for the weekly topic for a little additional review as well

as worksheets and study guides on the topic. See the Tutor Center website at lewis.sfsu.edu/tutoring.htm for more information.

Workshops For Chem 115: Four 90 minute weekly Chem 115 workshops are available to students. These classes begin the week of Feb. 9. Go to Trailer M (across from Thornton Hall) this week to sign up, or go to class next week. Schedule: M 11:00-12:30; T 12:30 – 2:00; W 12:15 – 1:45; F 11:10 – 12:40.

Lecture Information: The text will not be followed as written, so be sure to pay attention to the lecture schedule. The lecture schedule is subject to change during the semester, depending on the pace of the class. Lectures begin at 9:10 and end at 10:00. Please be courteous to the instructor and to fellow students by keeping talking to a minimum during the lecture, by being on time for lecture and by not packing up early. Please turn off all electronic devices during the lecture. Questions and comments from students during the course of the lecture are welcomed, expected and encouraged.

Course Description and Learning Objectives: CHEM 115 is organized around 4 conceptual themes - *Properties of Atoms*, *Interactions of Atoms*; *Reaction Chemistry and Stoichiometry*; and *Chemical Dynamics*. We start at the inside of the atom and work our way out, to understand how the atom is organized, and how that organization leads to chemical properties, how atoms organize into molecules, how those molecule interact and react with each other, and how chemical reactions are driven. Our goal to provide you with a conceptual framework on which to begin building your knowledge of chemistry and other sciences. While the course is strongly conceptual in approach, it is still rigorous. Not only will you be expected to demonstrate knowledge of facts (the what), you will also be expected to demonstrate a conceptual understanding of the chemical principles underlying the facts (the how and why). This course is not devoid of all calculations – we take a traditional approach to chemical stoichiometry, because chemistry is a laboratory science and stoichiometry is how we translate the way we interpret a chemical reaction into the way we carry out a chemical reaction in the lab. By conceptual theme, the learning objectives of this course include:

Properties of atoms an understanding of how electrons are organized in the atom and electron configurations, trends in atomic size, ionization energy, ionic size, the organization of the periodic table, the origin of lines in atomic emission spectra.

Interactions of atoms the nature of the ionic and covalent bond, nomenclature, chemical formulas, electron dot structures, resonance, geometry, hybridization, the polar nature of molecules, intermolecular forces and how these relate to phase changes, solubility and solutions.

Reaction chemistry and Stoichiometry identification and predicting the products of Bronsted-Lowry acid base reactions and precipitation reactions, identification and analysis of Lewis acid-base reactions and oxidation–reduction reactions, balancing chemical equations, converting between mass and moles, molar concentration, the ideal gas law chemical stoichiometry involving solids, solutions and gases, limiting reagents, titrations.

Chemical Dynamics enthalpy and entropy changes associated with chemical reactions and phase changes, the bond energy origin of enthalpy changes, contributions of enthalpy and entropy to the spontaneity of a reaction, the temperature dependence of chemical spontaneity, the collision theory of chemical reactions, factors that change the rate of a reaction, rate limiting steps and mechanisms, interpreting rate laws, evaluating reaction profile diagrams for thermodynamic and kinetic information, chemical equilibria, writing the equilibrium expression, interpreting the equilibrium constant, acid/base equilibria, how to shift a system at equilibrium (Le Chatelier's principle), the kinetic basis for Le Chatelier's principle.

Grading in Chem 115: There are 1000 points possible in the lecture, distributed as 3 mid-semester examinations (600/1000 pts), weekly graded on-line homework (100/1000 pts), and a cumulative final (300/1000 pts).

Exams The 3 midterm exams (200 pts ea) will be given on the dates indicated below and **will take place in the laboratory**. The entire lab period will be available to complete the midterms, but the

exams will be written as 50 minute exams. The mandatory **comprehensive final exam** (300 points) will be given as per the finals schedule in the **lecture classroom, Sci 101**.

Exam Dates:	<u>MW Lab Schedule</u>	<u>TTH Lab Schedule</u>
Exam 1	Wed Feb 25, in lab	Thurs Feb 26, in lab
Exam 2	Mon Mar 29, in lab	Tues Mar 30, in lab
Exam 3	Wed Apr 28, in lab	Thurs, Apr 29, in lab
Final	Wed May 26 8:00 – 10:30 am in Sci 101	

No make-up exams will be given. Equations will be provided. The exams are part multiple choice and part show-your-work. A number 2 pencil, scantron (Form 882-ES or equivalent) and calculator are allowed for the exam. Exam results will be posted on the lecture website. Solutions to the exams will be posted on the bulletin board across from Sci 101. Exams are returned in Lab.

Requests for regrades or corrections must be submitted in writing with a brief justification for the request. The request, exam and scantron should be given to the instructor by the deadline specified (generally 1 week after the exams are returned).

Graded Homework Mandatory homework worth 100 pts will be assigned on a weekly basis using OWL (on-line web-based learning). Homework assignments will be due on **Monday** mornings at 9:00 am (12:00 pm Eastern), and the next assignment available at the same time. Weekly assignments can not be made up. A handout on accessing and using OWL is attached.

Additional homework problems are assigned from the text, but they are not collected and graded. They are provided to check understanding of the material and as review for exams.

Academic Honesty All work submitted for evaluation in the lecture and the lab must be the student's own work. Any cheating incident will be reported to the Student Discipline Officer.

Course Grade: One grade is assigned for the class. Both the lecture (1000 points) and the laboratory (1000 points) determine final grades in the course. The lecture is worth 75% of the final course grade, and the laboratory is worth 25% of the final course grade. **To receive a grade of C- or better, a minimum of 500 points must be earned in the lecture and a minimum of 500 points must be earned in the laboratory.**

The final letter grade in the course will be assigned based on cumulative points earned in both the lecture and the laboratory (0.75(lecture points) + 0.25(lab points)):

850 to 1000 points	A- to A	350 to 499 points	D- to D+
700 to 849 points	B- to B+	below 349 points	F
500 to 699 points	C- to C+		

Special Needs: Any student who requires additional time for lecture exams or laboratory quizzes, or needs assistance in lecture or lab, must be registered with the Disability Programs and Resource Center (SSB 110, Phone (415)338-2472 (voice/TDD) Fax (415)338-1041; Email: drc@sfsu.edu). We will be unable to accommodate your needs if you are not registered with the DPRC.

Dropping the course: The drop deadline is Tues, Feb 24. Only students who do not meet the prerequisites for the course or do not pass the placement exam will be dropped by the instructor. Students who are enrolled in the course and decide to stop attending are responsible for dropping the course.

Incompletes and Withdrawals: Grades of incomplete are not allowed for this course. Between 2/25 and 4/28, withdrawals from the course are allowed by doing the following: (1) check out of locker; (2) get an unofficial transcript; and (3) complete a Petition for Withdrawal (available in Department Office, TH 806 or at the Student Services Center). Bring all of this to the instructor. To avoid a fine and a registration hold, be sure to check out of the lab locker.

Guide to using OWL – Homework due weekly, make-ups not allowed.

Browser: Explorer is recommended. Netscape has problems with shockwave modules.
Student web site: owl.oit.umass.edu/studentlogin.html
Select Chemistry General Satellite (SFSU)

Initial Login: example student : **Ernst Planck** student id: 123-45-6789
Login ID first initial, last name and 8th digit of student id **eplanck8**
Password 5th – 8th digit of student id for initial login. **5678**

Information from touchtone registration is used to create login IDs, so the name used is the official one on your SFSU records. Any hyphens, apostrophes or spaces in last names are dropped (O'brien becomes obrien).

General Information: Current assignments are listed in a table with a due date and a column for grade info. Click on any of the modules in the assignment to begin. Each module may be redone until the deadline. Completed modules will be marked with a green check. There are different types of assignment modules: simulations, tutors, exercises and homework. All of these modules are worth points and partial credit is given. Nothing needs to be done to turn an assignment in for credit. As each module in the assignment is completed, the score is automatically recorded by owl. A green check is an indication that credit has been received for the assignment.

The assignment does not need to be completed in one sitting. Review the assignment early in the week to get an idea of how long it is and schedule time accordingly. Because there is a week to complete the assignment, deadline extensions are not granted.

The initial assignment includes 3 exercises on how to use OWL. These introductory assignments are designed to prevent frustration and they are worth points, so please complete them. In addition, there is a survey to fill out, also worth points.

OWL was developed using a different textbook than the one used in Chem 115, so sometimes there are differences between the information in OWL and the information in the text or class. Please do not hesitate to ask any questions about any different information seen in OWL.

Help while doing OWL: There is a peach colored bar across the top of the OWL Question window. In this bar are links to reference materials to make life easier while doing the homework. There is a link describing how to enter chemical formulas in OWL, how to enter scientific notation, a periodic table, and a table of relevant chemical and physical properties.

Above the peach bar, there is a status line which indicates the question being worked on. Sometimes there is an icon of a page of paper here – this is an information page that can be referred to while working on the module.

Problems? Information about subscripts, superscripts or scientific notation, can be found in the link in the peach bar seen on homework assignment pages. Print these pages for future reference.

On the blue bar along the side of the browser window, there is a send message button. Click here to send a message to the instructor about problems with OWL. The reply can be viewed with the check message button. Technical problems related to the server being down, accessing the website or modules, or error messages while loading a module will be forwarded to the appropriate technical people. Login problems, content problems, and problems with answers and credit will be addressed by the instructor.

Campus Access to Computers for OWL

Chemistry Tutor Center, TH 408. Has computers available for OWL during tutor hours (T-F 11 – 2).
Media Access Center, 3rd Floor of Library. Has same hours as the library.

John F. True 24 hour Computer Lab (Library). Some computers are OWL compatible.