

# FAIRLEIGH DICKINSON UNIVERSITY

## SONS -CHEMISTRY (TEANECK CAMPUS)

Course: GENERAL CHEMISTRY II Lecture (CHEM-1202)

3 credits

Instructor: Dr. Arthur R. Murphy

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and by appointment.

Semester: Spring 2009

Required Text: Chemistry (9th Edition) by Raymond Chang

Classroom: RA 100

### Catalog Description:

The fundamental laws, theories and principles of chemistry, with emphasis on atomic structure, chemical bonding, periodic classification of the elements, solutions, equilibrium, reaction kinetics, and the theory and practice of the qualitative chemistry of the common ions. Prerequisite: elementary algebra, CHEM 1201 General Chemistry. Corequisite: CHEM 1204 General Chemistry II laboratory.

### Intended Audience:

General Chemistry II is an essential prerequisite for taking other chemistry courses. Students interested in the natural and biological science, engineering, computer science, and pre-professionals will find this course useful in the pursuit of their career objectives. Non-science majors seeking to broaden their backgrounds may also find the course of interest.

### Teaching Methodologies:

Traditional lectures involving board work and overheads are the primary manner in which the course material will be presented. As needed WEB resources will also be utilized.

A major objective of the course is the tight monitoring of academic performance. This is accomplished via numerous quizzes, homework assignments, group study assignments, and exams.

### Course Objectives and Outcomes:

**Objective 1:** Students should understand properties of liquids and solids

**Outcome 1.1:** Using should understand the types of Intermolecular forces, and they should be able to apply this knowledge so as to make qualitative judgements regarding properties of solids and liquids.

**Outcome 1.2:** Students should understand concentration units, and properties of ideal solutions.

**Outcome 1.3:** Learn about the major colligative properties and how to apply this knowledge.

**Objective 2:** To become familiar with elementary experimental and theoretical chemical kinetics.

**Outcome 2.1:** Students should understand the basic vocabulary associated with introductory chemical kinetics.

**Outcome 2.2:** Students should learn and understand rate laws and how they are determined.

**Outcome 2.3:** Students should be able to do elementary mechanism problems.

**Objective 3:** To become familiar with elementary chemical thermodynamics and chemical equilibria

**Outcome 3.1:** Students will be expected to know and apply the 2<sup>nd</sup> law of thermodynamics. Both macroscopic and microscopic points of view should be appreciated.

**Outcome 3.2:** Students should learn and understand the main features common to all equilibria, and they should be able to apply this knowledge to equilibria involving acids/bases, complexes, and sparingly soluble substances

**Objective 4:** To become familiar with basic electrochemistry

**Outcome 4.1:** Students should learn the fundamental vocabulary of electrochemistry.

**Outcome 4.2:** Students will be expected to know both the qualitative and quantitative features associated with galvanic and electrolytic cells.

**Objective 5:** To become familiar with basic electrochemistry

**Outcome 5.1:** Students should learn the fundamental vocabulary of electrochemistry.

**Outcome 5.2:** Students will be expected to know both the qualitative and quantitative features associated with galvanic and electrolytic cells.

**Objective 5:** To Understand Elementary Transition Metal Chemistry

**Outcome 5.1:** Students should learn the fundamental vocabulary of transition metal chemistry.

**Outcome 5.2:** Students will be expected to know structural, bonding, and spectral aspects associated with many transition metal complexes.

**Objective 6:** To become familiar with the overall structure of Organic Chemistry

**Outcome 6.1:** Review and apply basic principles of molecular structure to organic chemistry.

**Outcome 6.2:** Know how to recognize the major functional groups of Organic Chemistry. Understand elementary nomenclature.

**Outcome 6.3:** Understand some of the fundamental reactions of alkanes, alkenes, and alkynes, and aromatic molecules.

Students who successfully complete this course should have a good background for pursuing more advanced chemistry courses as well as courses in other sciences that require knowledge of General Chemistry. Specifically, students should have a good understanding of the fundamental properties of solutions, elementary kinetics, equilibria in both homogeneous and heterogeneous systems as well as in acid/base systems, and in sparingly soluble systems. Students will also become familiar with elementary chemical thermodynamics, electrochemistry (galvanic and electrolytic cells), transition metal complexes, and organic chemistry.

#### TENTATIVE LECTURE SCHEDULE AND PROCEDURES

Week #	Day	Date	Chapter(s)	Topic
1	M	Jan. 26	11	Math Review. Intermolecular Forces.
	W	Jan. 28	11	Properties of Liquids and Solids
	F	Jan. 30	11/12	Physical Properties of Solutions
2	M	Feb. 2	12	Physical Properties of Solutions
	W	Feb. 4	12	
	F (Q)	Feb. 6	12	
3	M	Feb. 9	13	Chemical Kinetics
	W	Feb. 11	13	
	F(Q)	Feb. 13	13	
4	M	Feb. 16	14	Chemical Equilibrium
	W	Feb. 18	14	
	F (E)	Feb. 20	14	
5	M	Feb. 23	15	Acids and Bases
	W	Feb. 25	15	
	F (Q)	Feb. 27	15	
6	M	Mar. 2	15	Acids and Bases (continued) Acid-Base Equilibria and Solubility Equilibria
	W	Feb. 4	15	
	F(Q)	Mar. 6	16	
7	M	Mar. 9	16	Acid-Base Equilibria and Solubility Equilibria (continued)
	W	Mar. 11	16	
	F(E)	Mar. 13	16	

8	M W F	Mar. 16 Mar. 18 Mar. 20		Spring Recess
9	M W F(Q)	Mar. 23 Mar. 25 Mar. 27	18 18 18	Entropy, Free Energy, Equilibrium
10	M W F(Q)	Mar. 30 Apr 1 Apr 3	19 19 19	Electrochemistry
11	M W F(E)	Apr. 6 Apr. 8 Apr. 10	19 20/21 20/21	Electrochemistry (continued) Chemistry of Metals and Non-metallic Elements
12	M W F(Q)	Apr. 13 Apr. 15 Apr. 17	22 22 22	Transition Metal Chemistry And Coordination Compounds
13	M W F(Q)	Apr. 20 Apr. 22 Apr. 24	23 23 23	Nuclear Chemistry
14	M W F (E)	Apr. 27 Apr. 29 May 1	24 24 24	Organic Chemistry  Organic Chemistry
15	M W F	May 4 May 6 May 8	11-24	Review
16	M W F	May 11 May 13 May 15		Final Exam Week. Specific date, time, and room will be announced.

### PROCEDURES

- Attendance is mandatory. If a student misses more than 3 lecture classes, the student is in attendance default. A student is automatically dropped from further grading when he or she is in attendance default and falls below the passing threshold for the course. As long as a student is passing, the attendance default has no meaning. Each time you attend class it is essential that you sign the official attendance sheet.
- The chemistry hourly exams are scheduled for FRIDAYS (Feb. 20, March 13, April 10, May 1). The dates have been marked with a (E) in the above lecture schedule. No make-up exams will be given. The exams will be given in RA100, and the exam period is from 8:00 am to 8:50 am. Students are permitted to start at 7:30 am so as to have additional time in which to complete the "hourly" exam. Free coffee and donuts will be provided prior to the exam complements of the Dean's office.
- After each exam, each student will receive a written assessment of his/her performance in the course.
- Eight short quizzes will be given on Fridays during the regular lecture period. The dates have been marked with a (Q) in the above lecture schedule. The best six of the eight quiz grades will be used to determine the overall quiz component of the final lecture grade. A no make-up policy will be in effect for the quizzes.
- Homework will be assigned and graded, and this grade is a component of each student's lecture grade. Late homework assignments will not be accepted.

- 6) SOS group study activities are scheduled as a fifty minute additions to the day General Chemistry laboratory periods. Every student taking General Chemistry lecture during the day is required to participate in a SOS study group. During your first General Chemistry (day) laboratory session you will be given additional information about SOS group study. If you are taking General Chemistry lecture during the day but taking a night General Chemistry lab, you are still required to participate in a day SOS group study section: attend the start of any day lab session and explain your situation to the instructor. If you are not taking General Chemistry I lab you are still required to take SOS group Study: attend the start of any day lab session and tell your instructor that you are taking Group Study.

During group study, students, working in small groups of 3 or 4, will be given problem sets to solve. These problem sets will be graded and will constitute a component of your lecture grade. Late problem sets will not be accepted.

- 7) At the start of each lecture session, an outline of the lecture will be distributed to each student.
- 8) April 3 is the last day to withdraw from the course with a letter grade of "W".
- 9) All cell phones and pagers must be turned off during lecture.
- 10) All students are expected to abide by FDU's Academic Integrity policy. A copy of the policy appears at the end of this syllabus.

## GRADING POLICY

Grade Component	Max. Points		
Hourly Exam #1	100	<-----	The lowest of this group will be dropped when computing the final grade.
Hourly Exam #2	100		
Hourly Exam #3	100		
Hourly Exam #4	100		
Homework	100		
Quizzes	100		
SOS Group Study	100		
Final Exam	100		
Final Exam	100	<-----	
Total	900		

## Academic Integrity

### "What is the University's Academic Integrity Policy?"

Students enrolled at FDU are expected to maintain the highest standards of academic honesty. Students have the responsibility to each other to make known the existence of academic dishonesty to their instructor and then, if necessary, the department chair, school director or academic dean of their College.

Course instructors have the added responsibility to state in advance in their syllabi any special policies and procedures concerning examinations and other academic exercises specific to their course. Students should request this information if not distributed by the instructor.

Academic dishonesty includes, but is not limited to, the following:

**Cheating** - Giving or receiving unauthorized assistance in any academic exercise or examination. Using or attempting to use any unauthorized materials, information or study aids in an examination or academic exercise.

**Plagiarism** - Representing the ideas or language of others as one's own.

**Falsification** - Falsifying or inventing any information, data or citation in an academic exercise.

**Multiple submission** - Submitting substantial portions of an academic exercise more than once for credit without the prior authorization and approval of the current professor.

**Complicity** - Facilitating any of the above actions or performing work that another student then presents as his or her assignment.

**Interference** - Interfering with the ability of a student to perform his or her assignments.

If a student is accused of any of the above infractions, there are sanctions which will be instituted. The Undergraduate Studies Bulletin outlines the procedure followed and the sanctions administered.

The FDU web site includes an [Academic Regulations](#) page. It is highly recommended that all students familiarize themselves with the specific regulations.