COLLEGE CHEMISTRY
(CH 103)
COURSE OUTLINE
SPRING SEMESTER 2002

Bfilent Terem

Course Objectives:

To introduce general principles of chemistry and relate them to socio-economic and environmental issues familiar to every college student.

Required Text Book:

Stanitski, C.L.; Eubanks, L.P.; Middlecamp, C.H., and Stratton, W.J., *Chemistry in Context: Applying Chemistry to Society,* McGraw Hill, Third Edition, 2000.

Web Pages: http://bterem.pageout.net
Announcements; lecture highlights; exam solutions; sample exams

Exams and Grading: Three 45-minute midterms, quizzes, homework assignments, class discussions, and a ninety minute comprehensive final.

Course Grade (all grades in percentages)
_ + .20 (average of the three midterms)
+ .20 (average of the two highest midterms)
+ .15 (average of assignments)
+ .15 (class discussion grade)
+30 (final)

Office Hours:

MWF 11:00- 12:00 and/or by arrangement

Office:

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Date	Chapters in Text	Subject
3/14	9	Chain branching... Important polymers...
3/17	9	Condensation polymers... **Polyamides**... "Paper or plastic?"
3/19	9	Polymers and ecology...
3/21		SECOND MIDTERM EXAM
3/24	10	What the doctor said... Should we consult a ***kahuna*** too? Do we expect miracles from drugs?
3/25-29		Spring Break
4/1	10	Organic chemistry clarifies a number or myths... Functional groups... Stereochemistry...
4/3	10	How aspirin **works**... Hormones... Steroids... "The pill"
4/5	10	Ethical considerations: Class discussion
4/8	11	Nutrition: What is a balanced diet?.. The macronutrients...
4/10	11	Carbohydrates and their metabolism...
4/12	11	Fats: Saturated and unsaturated... Cholesterol: facts and fiction...
4/15	11	Proteins... Lipoproteins...
4/17	11	Metabolism: The **thermodynamics** of the body... Vitamins...
4/19	11	The hunger problem in the world... Food preservation; food additives... Ethical issues...
4/22		THIRD MIDTERM EXAM
4/24	12	What chemists are promising for the future: Superconductors; Non-invasive diagnosis;
4/26	12	Catalysis... Enzymes...
4/29	12	Chemistry and beyond: Molecular biology...
5/1	12	Nucleic acids... DNA... Genetic engineering...
5/3		Review...
5/9	Thursday	FINAL (10:30 AM)

Date	Chapters in Text	Subject
1/14	1	Introduction... Why chemistry is called the central sciences?..
1/16	1	Chemicals... Elements, Atoms, Molecules, Compounds... Chemical symbols... States of matter... Chemical reactions...
1/18	1	Molecular formulas... Balancing a chemical equation... The air we breathe... Pollutants, are they all man made?
1/23	2	Ozone: Structure; Environmental significance... Subatomic particles... Lewis structures...
1/25	2	Radiation... Destruction of the ozone layer... Chloro-fluorocarbons...
1/30	3	Greenhouse effect and global warming... "The Greenhouse Gases" and What's shape got to do with it?.. Molecular geometry... Molecular vibrations...
2/1	3	The carbon cycle... Quantifying chemical processes... Moles and molar masses... What do we do with global warming?
2/4	4	Thermodynamics: Social and molecular perspectives... Heats of reactions
2/6	4	Energy of life... Energy and technology... Laws of thermodynamics...
2/8	5	Water: Molecular structure; Physical properties... Water and energy... Ionic compounds...
2/11	5	Purification of water... Social and legal issues concerning water...
2/13	5	Review
2/15		FIRST MIDTERM EXAM
2/20	6	Acid Rain... What is acidic about an acid? Acids and bases... Molarity... pH...
2/22	6	Acid precipitation... Ecological damage... Politics of acid rain...
2/24	7	Origin of radioactivity...
2/27	7	The problem of nuclear waste...
/1	7	Nuclear Fission... Hazards of radioactivity...
3/3	8	Sun: The ultimate source of energy... Heat transfer... Is water also a heat source?
3/5	8	Electrochemistry and electron transfer...
3/8	8	Cells and batteries...
3/10	8	What is fusion?.. Cold Fusion: Breakthrough or fiction?
3/12	9	Polymers... Monomeric units of polymers... Polyethylene...

COLLEGE CH STRY LAB
(CH 103L)
SPRING SEMESTER 2002

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OBJECTIVES:
This lab course is designed to convey to students a general understanding of experimental work in a chemistry laboratory while sampling certain broadly used techniques. During the semester "hands-on" experience will be emphasized along with demonstrations computer simulations, and work-shops.

LAB MANUAL:
Stanitski, C.L. *et. al.,* *Laboratory Manual Chemistry in Context,* **McGraw Hill, Third Edition, 2000.**
Reading must be done PRIOR to coming to lab.

SAFETY REQUIREMENTS:
Students will be expected to take the required safety precautions in the chemistry labs. This in itself is hoped to be educational. Safety glasses and adequate clothing and foot-were should be worn at all times during lab sessions. The consumption of food and beverages is strictly forbidden in the lab. Students are allowed to work in the lab only in the presence of the instructor.

GRADING:
It is hoped that students will learn and benefit from the lab course by efficient use of time during lab sessions. Therefore, 50% of the grade is based on participating in the lab sessions and on completing the experiment.

The following tasks will constitute the basis of the lab grade. All these tasks must be attempted in order to pass the lab course. No make-up labs will be given with the exception of extraordinary circumstances such as a **verified medical excuse with written verification from an MD detailing student's inability to attend lab. Any student with more than one unexcused absence will not be able to pass the lab course.**

Participation and completing the experiments	**50%**
Lab write-up / reports (when assigned)	**25%**
Lab quizzes and lab exam	**25%**

Chemistry is fun and enlightening...

SCHEDULE OF EXPERIMENTS

Week	Dates	Experiment	Reading Assignment
1	1/14	Introduction... Orientation... Safety Considerations	Syllabus
2	1/21	No Lab Martin Luther Kin Day)	
3	1/28	Weighing Air and Cooling Water: A Graphic Experience	CIC: pp. 2-1
4	2/4	Preparation and Properties of Gases in a Breath	CIC: pp. 1-1
5	2/11	Visibly Delighted: A Spectrophotometric Study of Colored Solutions; Photochemical Bromination; Types of Electromagnetic Radiation	CIC: pp.3-1 hand-out Computer Simulation
6	2/18	No Lab President's Day)	
7	2/25	Chemical Moles: Converting Baking Soda to Table Salt	CIC: pp.7-1
8	3/4	Comparison of the Energy Content of Fuels	CIC: pp.9-1
9	3/11	Analysis of Vinegar	CIC: pp. 11-1
10	3/18	The Ubiquitous Styrofoam Cup	CIC: pp.19-1
11	3/25-3-29	SPRING BREAK	
12	4/1	The Classification and Identification of Common Plastics	CIC: pp.20-1
13	4/8	Salt in Soups and Pickles	CIC: pp.25-1
14	4/15	Synthesis of Aspirin	CIC: pp.22-1
15	4/22	Fats in Potato Chips and Hot Dogs Isolation of DNA	CIC: pp.23-1 CIC: PP.28-1
16	4/29	Lab Exam	