GRANDE PRAIRIE REGIONAL COLLEGE

Department of Science and Technology

Discipline of Chemistry

Thirty-Fourth Session 1999 -2000

CHEMISTRY 1610 A2/B2: **Organic Chemistry I**

PREREQUISITE: **Chemistry 30 or equivalent**

INSTRUCTOR:

Dr. John P. Sloan,
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LECTURE:

CH1610 A2	**TR,**	**11:30 - 12:20 in J227**
CH1610 B2	**MW,**	**11:30 - 12:20 in J204**

ALBERTA TRANSFER CREDIT for CH1610 plus CH1630:

U of Alberta:	CHEM 161/163	6 credits
U of Calgary:	CHEM 351/353	6 credits
U of Lethbridge:	CHEM 2100/2200	6 credits
Athabasca U:	CHEM 2xx/2xx	6 credits
Augustana U Col:	CHE 1xx/1xx	6 credits
Concordia Col:	CH 161/163	6 credits
The King's U Col:	CHEM 2xx/2xx	6 credits
Canadian Union C:	CHEM 1xx/1xx	8 credits

COURSE OUTLINE:

Lecture Component:

A study of the fundamental principles of the chemistry of carbon compounds. The study is based on a reaction mechanism approach to the functional group chemistry of alkanes, alkenes, alkynes, cycloalkanes, alkyl halides, alcohols and ethers. Topics include: structure and bonding; physical properties; acidity and basicity; conformations of molecules; stereochemistry; addition, elimination and substitution reactions; structure-reactivity relationships; and introduction to methods for structure determination.

A representative selection of molecules found in agricultural, biological, environmental, industrial, medical, and pharmatheutical applications of organic chemistry will be discussed, e.g., molecules found in agrochemicals, fibres, food additives, perfumes, polymers, and prescription drugs.

Laboratory Component:
Laboratory Techniques in organic chemistry; preparation of some organic compounds, and; methods of qualitative organic analysis.

Tutorial Component:
Problem solving and discussion sessions with weekly problem sets. Regular tests will be given and marked.

Notes:

1. Lectures, Time and Place
   CH1610 A2 TR, 11:30 - 12:20 in J227
   CH1610 B2 MW, 11:30 - 12:20 in J204

2. Laboratory Component, Time and Place
   CH1610 L1 M, 14:30 - 17:20 in J119
   CH1610 L2 T, 14:30 - 17:20 in J116

3. Tutorial Component, Time and Place
   CH1610 S1 F, 10:00 - 10:50 in J202
   CH1610 S2 F, 13:00 - 13:50 in J201

TEXT BOOKS AND LABORATORY ITEMS:
The following books are required:

1. Solomons, T.W.G., and C.B. Fryhle, *Organic Chemistry*, 7th Edition, Wiley, 2000;

2. A Three Ring Binder to Hold: Sloan, J.P., *Organic Chemistry Experiments, Chemistry 1610/1630*, Grande Prairie Regional College, 1999/2000.

The following is highly recommended:

3. Molecular Model Set for Organic Chemistry, Prentice Hall.

The following is a supplementary item:

1. Fernandez, J.E., and Solomons, T.W.G., *Study Guide and Solutions Manual to Organic Chemistry*, 7th edition, 2000;

Note:
1. All required and supplementary books, molecular structure model sets, safety glasses, and

lab coats are available at the College Bookstore. *Organic Chemistry Experiments*, by J.P. Sloan, will be given as handouts in advance of each lab period. These are to be inserted in a three ring binder.

EVALUATION:

Examination Schedule and Composition of the Final Grade:

1.	Midterm Exam to be Scheduled for week of Oct 18 -----	20%
2.	Final Exam to be scheduled between Dec 13 & 21 -------	40%
3.	Laboratory ----------	25%
4.	Tutorial Grading Component ----------	15%
		100%

The Grades are based on the Nine Point Stanine Scale and correlate with the following designations:

Stanine		Designation
9	----------	Outstanding
8	----------	Excellent
7	----------	Very Good
6	----------	Good
5	----------	Fair
4	----------	Pass
3		
2		
1		

Notes:

1. The Mid-Term exam will be of 2 hours duration and the Final Exam will be of 3 hours duration.
2. Between 5 and 15% of exam content will be taken directly from weekly Tests.
3. A pass grade is essential for the Laboratory Component.
4. The Tutorial Grading Component consists of tests and will contribute towards 15% of the final grade. A 10 question test will normally be given each week during the tutorial hour. To encourage general discussion and active student participation, test questions may be answered within "paired teams". Tests not completed during the tutorial period are due within 24 hours without penalty, or later at the discretion of the Instructor. The marking scheme is:
   - 4.1 1 mark per correct answer with full details;
   - 4.2 ½ mark per correct answer with incomplete details;
   - 4.3 20% shall be deducted from the mark for each college business day that a test is overdue.
5. Regular attendance in Lecture, Laboratory, and Tutorial Components is a Course Requirement.

CHEMISTRY 1610
READING, STUDYING, AND PRACTICE PROBLEMS

All references are to T.W.G. Solomons and C.B. Fryhle, *Organic Chemistry*, 7th Edition, Wiley, 2000.

FALL SEMESTER

Weeks of Sept 8 & 13: **CARBON COMPOUNDS AND CHEMICAL BONDS.**

Sect #	Page #	Read and Study Chapter 1.
	1	Life is Organic Chemistry
1.1	2	Introduction;
1.2	3	The Development of Organic Chemistry as a Science;
1.3	4	The Structural Theory of Organic Chemistry;
1.4	7	Chemical Bonds and the Octet Rule;
1.5	9	Writing Lewis Structures;
1.6	10	Exceptions to the Octet Rule;
1.7	12	Formal Charge;
1.8	14	Resonance Theory;
1.9	18	Quantum Mechanics;
1.10	19	Atomic Orbitals of Electron Probability Densities, the Aufbau Principle, the Pauli Exclusion Principle and Hund's Rule;
1.11	21	Molecular Orbitals, Bonding and Antibonding;
1.12	24	The Structure of Methane and Ethane: sp^3 Hybridization;
1.13	28	The Structure of Ethene (Ethylene): sp^2 Hybridization;
1.14	33	The Structure of Ethyne (Acetylene): sp Hybridization;
1.15	35	A Summary of Important Concepts that Come from Quantum Mechanics;
1.16	37	Molecular Geometry: The Valence Shell Electron-Pair Repulsion (VSEPR) Model.
1.17	40	Representation of Structural Formulas: Dash, Condensed, Cyclic Molecules, and the Three Dimensional Wedge, Dash, Line Representation.
	45	Key Terms and Concepts.

Practice Problems: You are encouraged to work all of the in-chapter problems, and you are required to work all of the assigned weekly test problems. Routinely doing problems in organic chemistry leads to understanding of the theory, and good grades in organic chemistry. In the words of Solomons and Fryhle:

> *One way to check your progress is to work each of the in-chapter problems when you come to it. These problems have been written just for this purpose and*