



Grande Prairie Regional College
 Department of Science: Chemistry
 Forty-Fifth Session: 2010 – 2011

Course Outline: Organic Chemistry CH2630 A3

CH 2630 A3: Organic Chemistry II;

PREREQUISITE: CH1610 or CH2610

INSTRUCTOR: Dr. John P. Sloan
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 WileyPlus Web Site: <https://edugen.wiley.com/edugen/secure/index.uni>

LECTURE: CH2630 A3 M,W 8:30 – 9:50 in J229

TRANSFERABILITY/ALBERTA TRANSFER CREDIT

(Ref: 2010-2011 Guide to Transfer Credit at Alberta Post-Secondary Institutions)

GPRC:	CH 2610 (3)	CH 2630 (3)
U of Alberta:	CHEM 261 (3)	CHEM 263 (3) or AUCHE 252 3
U of Calgary:	CHEM 351 (3)	CHEM 353 (3)
U of Lethbridge:	CHEM 2500 (3)	CHEM 2600 (3)
Athabasca U:	CHEM 350 (3)	CHEM 360 (3)
Canadian UC:	CHEM 241 (4)	CHEM 242 (4)
Concordia UC:	CHEM 261 (3)	CHEM 263 (3)
King's UC:		CHEM 351 (3)

COURSE DESCRIPTION:

LECTURE COMPONENT:

A continuation of the study of the fundamental principles of the chemistry of carbon compounds as commenced in Chemistry 2610. The study is based on a reaction mechanism approach to the functional group chemistry of arenes, aldehydes, ketones, carboxylic acids, esters, amides, amino acids and carbohydrates. Topics include: structure and bonding; physical properties; acidity and basicity; conformations of molecules; stereochemistry; addition, elimination and substitution reactions; structure-reactivity relationships; aromaticity and aromatic substitution; and spectroscopic methods for structure determination.

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

LABORATORY COMPONENT:

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 assignments will be given and marked.

NOTES:

1. Lectures: Days, Time and Place
CH2630 A3 M,W 8:30 - 9:50 in J229
2. Laboratory Component: Day, Time and Place
CH2630 L1 W 14:30 - 17:20 in J116
3. Tutorial Component: Day, Time and Place
CH2630 S1 F 11:30 - 12:20 in J201

TEXT BOOKS AND LABORATORY ITEMS:

The following text book is required:

CH2630

Solomons, T.W.G., and C.B. Fryhle, *Organic Chemistry*, 10th Edition, Wiley, 2011, including access to the WileyPlus web site at: <https://edugen.wiley.com/edugen/secure/index.uni>.

And

A Three Ring Binder to Hold: Sloan, J.P., *Organic Chemistry Experiments, Chemistry 2610/2630*, Grande Prairie Regional College, 2010/2011.

Molecular Models are highly recommended, namely:

Molecular Model Set for Organic Chemistry, Prentice Hall.

Study Guides, Solutions Manuals, and Wiley Plus are supplementary items, namely:

1. Fernandez, J.E., and Solomons, T.W.G., *Study Guide and Solutions Manual to Organic Chemistry*, 10th Edition, 2011;
2. Wiley Plus at the web site: <https://edugen.wiley.com/edugen/secure/index.uni>

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.

GRADING CRITERIA/EVALUATION:

Examination Schedule and Composition of the Final Grade:

1.	Midterm Exam # 1, Friday February 18 -----	20%
2.	Midterm Exam # 2, Friday March 25 -----	20%
2.	Final Exam to be scheduled between April 14 – 27 -----	30%
3.	Laboratory -----	20%
4.	Tutorial Grading Component -----	10%
		<u>100%</u>

The Grades are based on the alpha grading system. The Registrar's Office will convert alpha grades to four-point equivalence for the calculation of grade point averages. Alpha grades, 4-point equivalence, and grade descriptors are as follows:

Alpha Grade	4-Point Equivalence	Percentage Guidelines	Descriptor
A ⁺	4.0	90 – 100	Excellent
A	4.0	85 – 90	
A-	3.7	80 – 84	Very Good First Class Standing
B+	3.3	77 – 79	
B	3.0	73 – 76	Good
B-	2.7	70 – 72	
C+	2.3	67 – 69	Satisfactory
C	2.0	63 – 66	
C-	1.7	60 – 62	
D+	1.3	55 – 59	Poor*
D	1.0	50 – 54	Minimal Pass*
F	0.0	0 – 49	Failure
WF	0.0	0	Fail, withdraw after the deadline

* Other post secondary institutions may not award transfer credit for grades of D and D+.

Grading Notes, and Student Responsibilities and Requirements:

1. The Mid-Term Exams 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 from a combination of weekly assignments, Wiley Plus, and questions in the organic chemistry textbook by Solomons and Fryhle.
3. A pass grade is essential for the Laboratory Component.
4. The Tutorial Grading Component consists of assignments and will contribute towards 10% of the final grade. A 10 question assignment will normally be given each week.
5. Assistance with course material will be given upon request.
6. Students are responsible for completing all course material.
7. Regular Attendance in Lecture, Laboratory, and Tutorial Components is a Course Requirement.

Grande Prairie Regional College Calendar 2010 - 2011: Course Description, page 178.

CH 2630 3(3-1-3)UT 105 Hours Organic Chemistry II

Continuation of the study of structural and chemical properties of the basic functional groups of organic compounds including aromatic compounds, aldehydes, ketones, carboxylic acids and their derivatives and amines. Illustration of these functional groups in natural products such as carbohydrates, amino acids and proteins, nucleic acids and lipids and discussion of the application of spectroscopic methods for structure determination in simple organic molecules.

Prerequisites: CH1610 or CH 2610

Notes: Credit will be granted for only one of CH1630 or CH2630.

Engineering students who take this course will receive 4.5 credits of transfer to University of Alberta.
Transfer: UA, UC, UL, AU, AF, CU, CUC, KUC

STATEMENT ON PLAGIARISM AND CHEATING:

Please refer to pages 48-49 of the College calendar regarding plagiarism, cheating and the resultant penalties. These are serious issues and will be dealt with severely.

COURSE LAYOUT: CHEMISTRY 2630: Timetable, Reading, Studying, and Practice Problems

All references are to T.W.G. Solomons and C.B. Fryhle, *Organic Chemistry*, 10th Edition, Wiley, 2011.

Winter Semester

Weeks of Jan 5 & 10: NUCLEAR MAGNETIC RESONANCE (NMR) and MASS SPECTROSCOPY (MS):
Tools for Structure Determination. Read and Study Chapter 9.

Problems/Page #'s:	In-Chapter	9.1 to 9.22
444	End of Chapter	9.23 to 9.47
455	Challenge Problems	9.48 to 9.53
456	Learning Group Problems	

Week of Jan 17: AROMATIC COMPOUNDS. Read and Study Chapter 14.

Problems/Page #'s:	In-Chapter	14.1 to 14.15
665	End of Chapter	14.16 to 14.39
673	Challenge Problems	14.40 to 14.44
674	Learning Group Problems.	

Weeks of Jan 24: REACTIONS OF AROMATIC COMPOUNDS. Read and Study Chapter 15.

Problems/Page #	In-Chapter	15.1 to 15.23
721	End of Chapter	15.24 to 15.53
725	Challenge Problems	15.54 to 15.57
726	Learning Group Problems.	

Week of Jan 31: ALDEHYDES AND KETONES I: NUCLEOPHILIC ADDITION TO THE
CARBONYL GROUP. Read and Study Chapter 16.

Problems/page #'s:	In-Chapter	16.1 to 16.18
766	End of Chapter	16.19 to 16.49
773	Challenge Problems	16.50 to 16.51
774	Learning Group Problems.	

Week of Feb 7 & 14: CARBOXYLIC ACIDS AND THEIR DERIVATIVES:
NUCLEOPHILIC ADDITION-ELIMINATION AT THE ACYL CARBON.
Read and Study Chapter 17.

Problems/page #'s:	In-Chapter	17.1 to 17.17
822	End of Chapter	17.18 to 17.48
829	Challenge Problems	17.49 to 17.54
830	Learning Group Problems.	

Week of Feb 21: Family Day and Winter Break: No Classes.

Weeks of Feb 28: REACTIONS AT THE α -CARBON OF CARBONYL COMPOUNDS – ENOLS AND ENOLATES. Read & Study Chapter 18.

Problems/page #'s:	In-Chapter	18.1 to 18.14
859	End of Chapter	18.15 to 18.34
865	Challenge Problems	18.35
865	Learning Group Problems.	

Week of March 7: CONDENSATION AND CONJUGATE ADDITION REACTIONS OF CARBONYL COMPOUNDS – MORE CHEMISTRY OF ENOLATES. Read and Study Chapter 19.

Problems/page #'s:	In-Chapter	19.1 to 19.22
899	End of Chapter	19.23 to 19.57
907	Challenge Problems	19.58 to 19.60
908	Learning Group Problems.	

Week of March 14: AMINES. Read and Study Chapter 20.

Problems/Page #'s:	In-Chapter	20.1 to 20.18
953	End of Chapter	20.19 to 20.49
960	Challenge Problems	20.50 to 20.54
962	Learning Group Problems;	

Week of March 21: PHENOLS AND ARYL HALIDES: NUCLEOPHILIC AROMATIC SUBSTITUTION. Read and Study Chapter 21. Read Special Topics G – Carbon-Carbon Bond-Forming and Other Reactions of Transition Metal Organometallic Compounds, pages G-1 to G-18.

Problems/Page #'s:	In-Chapter	21.1 to 21.12
991	End of Chapter	21.13 to 21.33
995	Challenge Problems	21.34 to 21.43
997	Learning Group Problems	
986	Second Review Problem Set 1 to 24.	

Week of March 28: CARBOHYDRATES AND LIPIDS (OPTIONAL). Read Chapters 22 & 23.

Problems/Page #'s:	In-Chapter 22	22.1 to 22.19
1043	End of Chapter	22.20 to 21.45
1046	Challenge Problems	22.43 to 22.45
1047	Learning Group Problems	

Problem/Page #'s:	In-Chapter 23	23.1 to 23.11
1079	End of Chapter	23.12 to 23.23
1082	Challenge Problems	23.24 to 23.25
1082	Learning Group Problems.	

Week of April 4: AMINO ACIDS AND PROTEINS & NUCLEIC ACIDS AND PROTEIN SYNTHESIS
(OPTIONAL).

Read Chapters 24 & 25: Amino Acids and Proteins & Nucleic Acids and Protein Synthesis

Problems/Page #'s:	In-Chapter 24	24.1 to 24.16
1129	End of Chapter	24.17 to 24.23
1130	Challenge Problems	24.24
1130	Learning Group Problems	

Problems/Page #'s:	In-Chapter 25	25.1 to 25.11
1162	End of Chapter	25.12 to 25.16
1164	Learning Group Problem	

Answers to Selected Problems, page A-1 to A-9.

Week of April 11: Review

Document Reference: H\CH2630\course outline\CH2630A3-10-11out.doc