West Los Angeles College Fall 2015 Semester

Chemistry 212 (Organic Chemistry II) Syllabus

Instructor: Dr. Mesfin Alemayehu

Lecture:	**M**	**W**	**11:10-12:35 pm**	**Rm. : MSA 111**
Lab:	**M**	**W**	**12:40-3:55 pm**	**Rm. : MSA 413**
Office hours:	***M***	***W***	***10:05 - 11:05 am & T, TH 9:30-11:00 am***	***Rm. : MSB 209***
			Tel: (310) 287-4299	

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Course description

Chemistry 212 (formerly Chemistry 18) is an organic chemistry course primarily for students who wish to continue in the fields of chemistry, pharmacy, medicine, dentistry etc.

This course is a continuation of Chem. 211, with emphasis on the remaining functional groups as well as special topics of molecular structure of organic compounds, bonding, stereochemistry, multi-step synthesis and application of modern instrumental and analytical methods. Introduction to the chemistry of some Biological compounds is also included. The laboratory work involves multi-step synthesis, structure determination, reaction mechanisms and qualitative analysis of Organic compounds. Chem. 212 provides the foundation for further work in Biochemistry.

Lecture hours per week: 3 Lab hours per wee: 6

Prerequisites:

A grade of C or better in Chemistry 211 is a prerequisite for enrollment in Chem. 212.

Text Book:

Lecture: Solomons and Fryhle, "Organic Chemistry" 11th Edition

Lab: Mohrig, Hammod and et al, "Modern Projects and Experiments in Organic Chemistry" (Macro and micro scale) 2nd ed.

Optional Reading Materials:

There is also a study guide for Morrison and Boyd that has solutions to the problems. The following books are also suggested: "Organic Chemistry" by Ege; "Organic Chemistry" by Brown; "Organic Chemistry" by Foot. Please understand that you can not learn by only attending classes, or by merely reading your notes or textbook. This course requires a lot of practicing in writing molecular structures, names of molecules, and reactions. There is no substitute for continuous effort to work out problems on your own. You should seek help only after you have done your best to solve the problem.

Student Learning outcome (SLO): **Upon completion of the course, you will be able to:**

- Demonstrate detailed familiarity with the following functional group categories: Carboxylic acids and derivatives, amines, aromatics, polynuclear aromatic compounds, heterocyclic compounds biological compounds compounds, including: their properties, reaction, synthesis and analysis

- Apply molecular orbital theory to conjugated aliphatic and aromatic compounds.

- Utilize spectroscopy in structure elucidation.

- Demonstrate familiarity, including structure and bonding, physical properties, nomenclature and stereochemistry,

  of the following categories of biochemical compounds: Amino acids and proteins, carbohydrates, lipids and nucleic acids.

- Perform independent chemical literature searches.

- Perform multistep synthesis and analysis of some organic compounds.

- Identify molecular structures of organic compounds from spectral date.

- Apply Lab safety rules

- Set-up an experiment

- Demonstrate the use of analytical instruments to identify organic compounds

- Explain observations

- Apply theory in lab work

- Analyze data and come to a conclusion

- Apply scientific methods in solving problems

- Prepare organic compounds in two or three steps

- Practice the safe use of chemicals

- Demonstrate skills and laboratory techniques for, purification of organic compounds, separation of mixtures and short step synthesis of drugs.

- Write laboratory reports based on collected experimental data and results

Laboratory:

Chemistry 212 is a lecture and laboratory course. Failure to perform the experiments and hand in the work will result in an unsatisfactory grade in the course. For reasons of safety, lab work must be done only during the assigned laboratory periods and when the instructor is around.

NOTE: You must wear eye protection whenever you are in the lab. If you do not have the appropriate eye protection you may be dismissed from the laboratory section with loss of credit for that exercise.

Do not wear contact glasses in the lab. They can absorb or trap some organic vapors and fumes and could cause eye damage. Eating or drinking in the lab is prohibited. Read the instructions and the procedure for the experiment before coming to the lab. Preparing flow charts before coming to the lab will help you to finish the experiment in time and prevents avoidable accidents from happening.

Record all the data (including your observations) **in ink in a stiff-covered bound** lab notebook. Have your lab instructor sign your notebook before you leave the lab at the end of the each lab period.

Your Report Should Contain the Followinti Sections:

A. (Pre-lab report: should be completed before coming to the lab)

I. Date the experiment was performed

II. Title of the experiment

III. Objective of the experiment (this is a brief statement of the purpose of the experiment)

IV. Chemicals and reagents used (include their molecular formula, molar mass, mp, bp, amounts used, reaction equations if known, etc.)

V. Procedure (at least indicate name and page of source)

B. (During lab: Must be recorded during lab period)

VI. Observations: Any observation made during the experiment (data collected, color changes and other visible changes) should be recorded.

C. (post-lab report: should be completed after the experiment is done, should be based on date collected and observations made during lab)

VII. Calculations and graphs

VIII. Discussion and conclusions: If possible, compare your results to known (accepted) values (consult your textbook, and physical or chemical handbooks and indicate your reference source). Comment on the results you obtained in relation to the principles of the experiment and the acceptable value from literature.

There are some services on campus for students with learning disabilities. Such students may contact the office and get the appropriate help and accommodations

Lab Grade Distribution:

Attendance	50 pts
Pre-lab report	30 pts
Participation in lab	30 pts
Lab report/write up	40 pts
Total Lab Points	150

Examination and Final Grade Distribution:

Final exam in the lecture will **be inclusive.** Final grades will be assigned primarily on the basis of points accumulated as follows:

3 lecture exams	300	pts
1 final exam	250	pts
Performance in lab	150	pts
Student project	50	pts
Total Points	750	pts

A starts at 85% B starts at 75% C starts at 60% D starts at 50%

A passing grade will be contingent on successful completion of assigned experiments. There will be no **make-up lab** or **exam.** A grade of zero will be assigned for a missed lab or exam. You are responsible for information, exam announcements, date changes, etc. presented in class, whether or not you are present. Students who are absent for 3 consecutive class meetings or 6 class meetings throughout the course without presenting a valid excuse could be dropped from the class.

During Exams students may leave the exam hall only after submitting their exam paper to the instructor. A student who has left the hall for any reason during the exam may not be allowed to come back and finish the exam or make any changes in his/her answers.

A student who comes to the exam hall after the exam is started, may not be allowed to take the exam if at least one student has left the exam hall before he/she came into the hall.

Cell phones and beepers must be turned off during lass and lab.

Withdrawal From Class: You are responsible for your credit and enrollment status. Any student withdrawing from class must officially inform the admissions office of his/her decision**. Students who fail to follow the correct procedure for withdrawals will receive a grade of *F* for the course at the end of the semester**.

Last day to drop without a "W" is September 11, 2015

Last day to drop with a "W" is November 20, 2015

For important deadlines, please refer to the Fall semester class schedule.

The college academic honesty policy (please read catalog) will absolutely be upheld in this course. Neither cheating nor copying will be tolerated.

TENTATIVE LECTURE SCHEDULE

Week of	Lecture Topic	Chapter
Aug. 31	Aromatic Compounds	14
Sep. 7	Reactions of Aromatic compounds	15
Sep. 14,21	Aldehydes and Ketones I Nucleophilic. Addition reactions	16
	EXAM # 1	
Sep. 28,& Oct.5	Carboxylic acids and their derivatives (Nucleophilic addition-elimination rxns)	17
Oct. 12	Reactions at the a carbon of carbonyl compounds (Enols and Enolates)	18
Oct. 19	Condensation and conjugate addition rxns of carbonyl compounds	19
	EXAM # 2	
Oct. 26	Amines	20
Nov. 2, 9	Phenols and Aryl halides– (Nucleophilic aromatic substitution)	21
Nov. 16	Carbohydrates	22
Nov. 23	Lipids	23
	EXAM # 3	
Nov. 30	Amino acids and proteins	24
Dec. 7	Nucleic acids protein synthesis	25

Final Exam December 16, 2015

West Los Angeles College Fall Semester
Chem. 212 Tentative Lab Schedule

Lab No.	Title	source	No. of lab periods
1	Check in and Orientation	**Video**	1
2.	Workshop on Instrumentation	**TBA**	1
3	Oxidation **/ IR analysis**	**Mohring (E13.1)**	2
Mix reagents for E 20 Before leaving and give it to Instructor			
4	Photoreduction of benzophenone	Hndout	1
5	Nitration of Methyl Benzoate	**Handout**	1
6.	Acylation and alkylatio	**Neckers (E. 22)**	1
7.	**Aldol condensation**	**Mohring (P11.1)**	**1**
8.	Identification of Alcohols, Ketones and Aldehydes **(Unknowns**)	**Handout**	3
9	Grignard synthesis	**Mohring (E. 26)**	1
10.	Synthesis of Isopentyl acetate/**GC**	**Mohring (E 12.1)**	2
11.	Phase transfer catalyst	**Mohring (E.18)**	1
12	Isolation of lactose	**Handout**	1
13	Glucosepentaacetate	**Mohring (p 14.1)**	2
14.	Synthesis of Benzoyl amino acid	**Mohring (E.28.1)**	1
15	Synthesis of 5,5-diphenylhydantoin	**Handout**	1
16	Synthesis of p-aminobenzoic acid	**Handout**	1
17.	Preparation of Diazonium salt	Handout	1
18	Synthesis of Benzocain / **IR**	**Mohring (E. 12.2)**	2
19.	3,5-dinitrobenzoate (esterification)	Handout	1
20	Checkout		1

E = Experiment; P = Project; Q = Qualitative analysi