

JOHN JAY COLLEGE OF CRIMINAL JUSTICE
The City University of New York

Syllabus Content:

College name and address: John Jay College of Criminal Justice, The City University of New York

Course title and section: Chemistry 202 Organic Chemistry Sections 801, 802, 803 Summer 2013

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Course description

Today's qualified forensic scientist must acquire a capacity for logical reasoning, an imaginative approach to solving problems and a flexibility that allows adaptation to a changing world.

CHEM 202 aims to develop these qualities in the area of introductory organic chemistry. Goals of the course are, also, essential experimental laboratory skills and fundamental knowledge in

the foundations of organic chemistry.

In particular, CHEM 202 continues the systematic examination of the reactions of the common functional groups that began in CHEM 201 (Organic Chemistry I). Alcohols, aromatic compounds, aldehydes and ketones, carboxylic acids and their derivatives, amines, nucleic acids, carbohydrates, and amino acids will be studied. Several lessons will be devoted to various forms of spectroscopy, which is the principal way modern organic chemists determine the structures of molecules.

The laboratory component of this course consists of fourteen double-John Jay sessions over the semester. The lab work consists of synthesis, purification and analysis of organic compounds. The recitations, held in a single John Jay period weekly, will be dedicated to explaining difficult topics, answering student questions, reviewing the material discussed in the lectures.

Learning outcomes

Reasoning

- Predict the major product in an organic reaction, such as those involving carbonyl, amino, allyl, or aromatic groups.
- Write synthetic schemes for the production of different classes of these compounds.
- Analyze spectroscopic data to solve the structures of organic compounds.
- Perform retrosynthetic analysis.
- Predict the optical activities and stereochemistry properties for different classes of compounds.

Knowledge

- Recognize main functional groups in organic compounds.
- Name organic compounds using the IUPAC nomenclature.
- Recognize nucleophiles, electrophiles and their reactivity in order to predict the course of a reaction.
- Interpret laboratory instructions, safety sheets and experimental protocols.
- Define the structures and properties of organic compounds.
- Describe basic organic chemistry mechanisms (SN_1 , SN_2 , E_1 , E_2 ...).
- Explain the theory behind basic spectroscopic methods.
- Use appropriate current technology in the laboratory to obtain data and understand the impact that recent technologies have on the field.

Practical skills

- Apply basic synthetic skills.
- Illustrate basic spectroscopic techniques:
 - * Standardize and operate laboratory instruments to identify reactants and products and to separate mixtures of compounds.
- Obtain information about chemical compounds from all possible sources;
 - Apply this information for the safe handling, use and disposal of such compounds in a safe and environmentally responsible manner

Communication

- Give small presentations on organic compounds.
- Prepare laboratory reports in accordance with current forensic reports' styles.

Course pre-requisites or co-requisites CHE 201 and all the pre- and co- requisites for CHE 201

Requirements / Course policies

Students enrolled in this course are required to attend all lecture, recitation, and laboratory sessions of the section for which they registered. There are two lecture sessions, two recitation sessions, and one laboratory session per week. If a student needs to miss classes he/she may do so, but the instructor may then ask to withdraw from the course. More than 3 absences in the labs, lectures or recitation classes will result in an unofficial withdrawal grade. The information missed is vital to your future profession. Attendance, enthusiasm, and active class participation are observed, recorded, and reflected in the student's final grade. Late arrival to the lab WILL NOT be tolerated (students will be penalized if late): such behavior has direct consequences upon the safety in the lab. Attendance is taken solely from roll sheets circulated at the beginning and/or end of each session or by the clickers. Lateness or early departure counts as 1/2 absence. Students missing more than 30 minutes of a session will be counted as absent. Obviously there is no penalty for students when classes are canceled.

Required Texts

Lecture Text:

Organic Chemistry, 10th Edition, by Solomons, John Wiley and Sons, Incorporated 2009

You have the flexibility of buying the book in different formats, each at different prices.

The ISBN of the cheapest version with WileyPlus is 9780470932742: this is the binder-ready

version of the textbook with a WileyPLUS code.

Do not throw away the WileyPlus registration card, as resources found in WileyPlus may be used in class and homework may be assigned online.

The library (212-237-8200) owns several copies of the textbook and so does the Math and Science Tutoring center (646-557-4595).

John Jay Bookstore

- 1.) Text with WileyPlus, (standard version of the book packaged with WileyPlus)
- 2.) BinderReady Text with WileyPlus, (3 hole punched, color pages, just like the regular book, without the binding. You can carry chapters with you to class or insert in a binder of your choice) www.wileyplus.com
- 3.) WileyPlus (buy directly online from www.wileyplus.com)
(Here you do not get a physical book, just access to online ebook, all learning tools, and homework problems.)

Lab Manual: (The lab manual must be brought to each laboratory session.)

Introduction to Organic Laboratory Techniques: A Microscale Approach, 4th Edition
Donald L. Pavia | Gary M. Lampman | George S. Kriz | Randall G. Engel

Necessary for recitation and during the lecture exams: Molecular structure models [the instructor recommends models from HGS Molecular Structure model, but you are free to get different models that satisfy you].

Other required material (to be brought to each laboratory session):

Splash-resistant safety goggles or safety glasses meeting the ANSI Z87.1-1989 standard. All students must wear safety glasses or goggles in lab. Students requiring corrective lenses must wear safety glasses or goggles over the corrective lenses.

A non-programmable scientific calculator that can be removed from its case (available at most electronic stores).

Grading

This course has three components -- lecture, recitation, and laboratory. Each component has a

separate grading policy, which contributes a percentage to the overall course grade. In general, the course grade is the sum of the grades earned in the lecture (60%) recitation (15%) and laboratory (25%) sessions. However, since the lab sessions are an integrated component of the course, where lab safety skills and dexterity are taught for use in subsequent science courses, for safety reasons, a minimum lab grade of 60% is required to pass the course. In order to pass the lecture portion of the course a minimum of 240 points out of 400 in the four lecture exams are necessary. Unethical/unprofessional conduct will result in a failing course grade and referral for additional action.

Lecture: During the lecture sessions, four exams are given (three of them count as 20% of the lecture grade and last 1 hour and 05 minutes, the fourth exam will count as 30% of the lecture grade and last 1 hour and 30 minutes). There are no make-up exams. Unexcused absences from exams will result in a grade of zero. Excused absences will not lead to a penalty but remaining exams will be weighted correspondingly more. Missing three (3) exams automatically constitutes a grade of F for the course. During the final exam's week the American Chemical Society (ACS) standardized test (which lasts two hours) is given which counts as 10% of the final grade. It is a cumulative exam and it needs to be taken in the date dictated by the instructor (ACS regulation). If a student misses the ACS standardized test in the final week of exams and he is passing the course up to that point, he will receive a grade that correspond to the average of the other four exams. If he is missing the ACS exams during the final week of exams and he is not passing the course up to that point a grade of "F" will be assigned. **THERE WILL BE NO MAKE-UPS OF THE ACS EXAM or OF ANY OTHER EXAMS.** It is important to understand that it is students' responsibility to come to class and take the exams. During the exams books remain closed. A non-programmable, scientific calculator may be used during exams if it is removed from its case.

Recitation and Homework: During the recitation sessions, students are encouraged to participate in discussions and activities related to the lecture material and homework. Active participation by all students benefits all students, providing varying approaches to mastering the subject material, incentive, and progress evaluation. Consequently, absences or failure to meaningfully participate will result in a significant course grade penalty. Students' grade will be based on the homework assigned by the recitation/lecture instructors (10%) and participation/attendances in the recitation class (5%). Students, during recitation and lecture sessions, are required to come to the board and do exercises in front of their colleagues in order to get credit for their participation. No computer-based homework will be corrected or graded if handed in a paper copy.

Laboratory:

Pre lab questions 8-15 points

Post lab questions 8-15 points

Safety 5-10 points References must be included.

Results/observations 15-25 points All results must be clearly stated and all observations recorded.

Calculations 5-15 points Correct units must be used.

All yields must be reported.

All numbers must be explained

Explanation/discussion/conclusion 30-50 points This is a crucial part of the lab report.

Detailed explanations of all your results and observations must be included.

Your writing must be concise and easy to understand.

The conclusion has to be thorough and you must demonstrate that you understood the principles of the lab.

Remember: There is no wrong or right. If results are different from what is expected DO NOT INVENT. Instead, try to find logical explanations for what happened. This will be taken into account and your grade will not suffer from it, as long as you provide a reasonable justification. This is the opportunity to develop your critical thinking abilities and your writing skills.

Reports written by Forensic Scientists must be clear, concise, and unambiguous. Consequently, when a question in the test/quiz/laboratory report assigned requires a written explanation, spelling, grammar, and clarity of expression will be considered in determining the “correctness” of the answer proffered. It is important that careful attention is directed to writing what you mean and meaning what you write. If the grade on the first two laboratory reports is below B, students will be referred to the Writing Center Services (212-237-8659).

Course calendar

SESSION	DATES	TOPICS	CHAPTER	HOMEWORK
May/June				
1	29	Alcohol and Ethers	11	Ch. 11
2	03	Alcohol and Ethers	11	
3	05	Alcohols from Carbonyl Compounds	12	Ch. 12
4	10	Alcohols from Carbonyl Compounds	12	

5	12	Conjugated Unsaturated Compounds	13	Ch. 13
6	17	Aromaticity – Test 1	14	Ch. 14
7	19	Reaction of Aromatics Compounds	15	Ch. 15
8	24	Reaction of Aromatics Compounds	15	
9	26	Aldehydes and Ketones – Test 2	16	Ch. 16
July				
10	01	Aldehyde and Ketones	16 -17	Ch. 17
11	03	Aldehydes and Ketones	17	
12	08	Carboxylic Acids and their derivatives–Test 3	18	Ch. 18
13	10	Synthesis and Reactions of Dicarboxyl Compounds	19	Ch. 19
14	15	Synthesis and Reaction of Dicarboxyl Compounds	19	
15	17	Amines	20	Ch. 20
16	22	Amines – Test 4	20	

SESSION	DATES	TOPICS	CHAPTER	HOMEWORK READINGS
May/June				
1	30	Check - In , Lab Safety, Procedures, Glassware	N/A	Techniques 1, 2, 3, 4, 29
2	04	Caffeine in Soda and Coffee HPLC analysis	Handout	Essay "Caffeine" pg 87
3	06	Exp 49A, B Preparation and Properties of Polymers: Polyesters and Polyamides	406 - 410	Essay "Polymers and Plastics" pg 397
4	11	NO LAB – ChemDraw Assignment	Handout	
5	13	Exp 13A Isopentyl Acetate Preparation through Workup	103 - 105	Essay "Esters – Flavors and Fragrances" pg 99 Techniques 5, 6, 7.2 - 7.4, 12, 13, 14
6	18	Exp 13A Isopentyl Acetate Distillation and IR analysis	105	Technique 25 pg 833-838, 849-867
7	20			
8	25	Multistep A, B Synthesis of Acetanilide and 4-bromoacetanilide	Handout	Handout/Techniques 11.3, 11.7
9	27	Multistep C Synthesis of 4-bromo-2-chloroacetanilide	Handout	Technique 7.8
July				
10	02	Multistep D Synthesis of 4-bromo-2-chloroaniline	Handout	
11	09	Multistep E and IR analysis Synthesis of 4-bromo-2-chloro-6-iodoaniline	Handout	Technique 25

12	11	Preparation of Phencyclone	Handout	
13	16	Exp 25A 4-Methylcyclohexene w/ tests for unsaturation and IR	211-216	Technique 12.5, 12.9, 14, 25
14	18	Exp 52 Luminol	437 - 441	Essay "Fireflies and Photochemistry" pg 433 Techniques
15	23	Lab Final , Check out	N/A	Review all materials
16	25			

WED	MON	MATERIAL TO BE REVIEWED
5/30	6/04	
6/06	6/11	
6/13	6/18	TEST 1
6/20	6/25	TEST 2
6/27	7/2	
7/11	7/9	TEST 3
7/18	7/16	
7/23	7/23	TEST 4

College wide policies for undergraduate courses (see the *Undergraduate Bulletin*, Chapter IV Academic Standards)

Incomplete Grade Policy

An Incomplete Grade may be given only to those students who would pass the course if they were to satisfactorily complete course requirements. It is within the discretion of the faculty member as to whether or not to give the grade of Incomplete.

Extra Work During the Semester

Any extra credit coursework opportunities during the semester for a student to improve his or her grade must be made available to all students at the same time. Furthermore, there is no obligation on the part of any instructor to offer extra credit work in any course. The term "extra credit work" refers to optional work that may be assigned by the instructor to all students in addition to the required work for the course that all students must complete. It is distinguished from substitute assignments or substitute work that may be assigned by the instructor to individual students, such as make-up assignments to accommodate emergencies or to accommodate the special circumstances of individual students.

Americans with Disabilities Act (ADA) Policies

Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office of Accessibility Services (OAS). Prior to granting disability accommodations in this course, the instructor must receive written verification of a student's eligibility from the OAS which is located at L66 in the new building (212-237-8031). It is the

student's responsibility to initiate contact with the office and to follow the established procedures for having the accommodation notice sent to the instructor."

Statement of the College Policy on Plagiarism

Plagiarism is the presentation of someone else's ideas, words, or artistic, scientific, or technical work as one's own creation. Using the ideas or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations require citations to the original source.

Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism.

It is the student's responsibility to recognize the difference between statements that are common knowledge (which do not require documentation) and restatements of the ideas of others. Paraphrase, summary, and direct quotation are acceptable forms of restatement, as long as the source is cited.

Students who are unsure how and when to provide documentation are advised to consult with their instructors. The Library has free guides designed to help students with problems of documentation. (*John Jay College of Criminal Justice Undergraduate Bulletin*, <http://www.jjay.cuny.edu/academics/654.php> , see Chapter IV Academic Standards)

Plagiarism detection software - the College subscribes to Turnitin.com and Blackboard has a similar module called SafeAssign. If you will be using any plagiarism detection software in your course, you must state it on the syllabus.