



Centro Universitario Internacional



CHE 210E Organic Chemistry I

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Fall 2018

Course Information:

Office:

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Office Hours: by appointment

"If you wish to understand the fragrance of the rose or the tenacity of the oak; if you are not satisfied until you know the secret paths by which the sunshine and the air achieve these wonders; if you wish see to the pattern which underlies one large field of human experience and human measurement, then take up Chemistry."

Charles Coulson – Professor of Chemistry, Oxford University

Course materials (required):

- 1) D.E. Klein, *Organic Chemistry*, 1st Ed., John Wiley&Sons, 2012
- 2) Brooks-Cole, *Organic Chemistry Laboratory Notebook* (100 carbonless duplicate pages).

Course materials (optional):

- 1) Darling, Molecular Visions Organic Model Kit.
- 2) Harwood and Claridge, *Introduction to Organic Spectroscopy*, Oxford University Press, 1996.

Course Assessment:

Lab	25 points
Problem sets	15 points (6 @3 points each, drop one)
Midterm exams	25 points (2 @ 12.5 points each)
Final exam	30 points
Dictionary	3 points
In-class quizzes	2 points (5 @ 0.5 points each, drop one)

Total 100 points

Lab (25 points): Please see separate syllabus for laboratory component. Your grade will be based on both submitted lab reports and pre-lab quizzes.

Problem sets (15 points): You will complete 6 problem sets throughout the semester; of these, I will take the best 5 out of 6 and assign each a grade out of 3 for a total of 15 points. The problem sets will be posted online in the morning of the day specified and will be due in class on the due date – no exceptions! The answers for the previous problem set will be posted online immediately following submission; therefore late assignments will not be accepted. The problem sets are designed as a tool for you to practice and master the

course material in preparation for the midterms and final exam and will be comprised of both routine “practice” problems and more challenging “applied theory” problems. Please see the course schedule below for posting and submission dates and note them accordingly in your personal agenda.

Midterm exams (25 points): Two midterm exams will be held throughout the semester. While I aim to have certain material covered for the midterms, the pace of the course indicated in the lecture outline might not coincide with the midterm date. I will confirm in class and through online communications what material will be included on the midterm in advance. In general, the material on the midterm exams will be up to and including the end of lecture on the Monday of the same week.

Final exam (30 points): The final exam will take place during the final exam period (last week of the semester). You must take the final exam to pass the course, but you do not have to pass the final exam to pass the course. The final exam will encompass all material covered in the semester, but not equally weighted.

Dictionary (3 points): In order to be successful in Organic Chemistry, one must think and talk like an Organic Chemist, yet the volume of new terminology and phrases can be overwhelming to students learning the subject for the first time. To assist you in keeping all of these new words in order, you will create and maintain an “Organic Chemistry Dictionary” during the course. Please see the separate document detailing how you should organize your dictionary and what material it should contain. Your dictionary is due when you write your final exam and will be returned to you once graded.

In-class quizzes (2 points): Five in-class “pop” quizzes will be held during the semester, on dates selected at my discretion; of these, I take the best 4 out of 5 and assign each a grade out of 0.5 for a total of two points. The quizzes may be held during our regular morning lectures or during the lab lecture period, and may include both closed-book and open-book quizzes.

Topics	Class Schedule
Constitutional isomers, Lewis structures, formal charges. Nomenclature.	12/09 (W)
Induction, polarity, Valence Bond Theory, Molecular Orbital Theory, hybridization(I). Nomenclature.	17/09 (M)
Lab lecture	17/09(M)
Hybridization(II), Valence Shell Electron Pair Repulsion (VSEPR).	19/09 (W)
Dipole moments, molecular polarity, intermolecular forces (IMF), physical properties. 1 st Problem set	24/09 (M)
Lab lecture	24/09 (M) LL

Bond line structures, resonance	26/09 (W)
Resonance. Brønsted-Lowry acids and bases	01/10 (M)
Lab lecture	01/10 (M) LL
Acidity: Quantitative and qualitative perspective	03/10 (W)
Position of equilibrium. Choice of reagents and solvents.	08/10 (M)
Lab lecture	08/10 (M) LL
General review 2nd problem set	10/10 (W)

-Alkanes and Cycloalkanes 1	15/10 (M)
-Alkanes and Cycloalkanes 2	15/10 (M)
- Alkanes and Cycloalkanes 3	17/10 (W)
- Alkanes and Cycloalkanes 4	22/10 (M)
exercises	22/10(M)
MIDTERM 1 VP Problem set 1	24/10 (W)
-Stereoisomerism 1	29/10 (M)
- Stereoisomerism 2	
Lab lecture (EXP 4)	29/10 (M)
- Stereoisomerism 3	05/11 (M)
Lab lecture (EXP 5)	05/11 (M)
-Stereochemistry 4: Fisher projections	07/11 (W)
- exercises	12/11 (M)
Lab lecture (EXP 6a)	12/11 (M)
-Substitution reactions 1 VP Problem set 2	14/11 (W)
-Substitution reactions 2	19/11 (M)
Lab lecture (EXP 6b)	19/11 (M)
-Substitution reactions 3	21/11 (W)
-Substitution reactions 4	26/11 (M)

Exercises	26/11 (M)
-Elimination reactions 1	28/11 (W)
- Elimination reactions 2	3/12 (M)
- Elimination reactions 3	3/12 (M)
- Elimination reactions 4	5/12 (W)
-Mass Spectrometry 1	10/12 (M)
-Mass Spectrometry 2	10/12 (M)
- exercises VP Problem set 3	12/12 (W)
FINAL EXAM+MIDTERM 2	17/12 (M)

Laboratory

Week #	Lab Dates	Experiment Title*	Lab Quiz	Assessment Due
1	9/18	Expt 1: Separation of a three component mixture by extraction acid-base	Y	
2	9/25	Expt 1: Separation of a three component mixture by extraction acid-base		Exp 1 notebook
3	10/2	Expt. 2: TLC of OTC medications	Y	Expt 1: Lab report Expt. 2 notebook
4	10/9	Expt. 3: Determination of an Unknown Liquid	Y	Expt 2: Lab report
5	10/16	No lab		
6	10/23	Expt .3: Presentation	N	Expt. 3 notebook Expt. 3 presentation
7	10/30	Expt. 4: Solubility behavior of organic compounds	Y	Expt 4 notebook
8	11/6	Handout	N	Expt. 4 worksheet
11	11/13	Expt. 5: Nucleophilic Substitution	Y	Expt 5 notebook
12	11/20	Expt. 6: Resolution of a Racemic Mixture (wk 1)	Y	Expt 5 worksheet
13	11/27	Expt. 6: Resolution of a Racemic Mixture (wk 2)	N	Expt 6 notebook
14	12/4			Expt 6 lab report

Class policies

Cell phones: Absolutely no cell phones in class! Please turn your cell phones to silent or off during lecture and during exams. No texting. If you anticipate an emergency and are expecting a call, please set your phone to vibrate, sit near the exit and excuse yourself if it rings. Likewise, no cell phones in the lab – please leave them in your bags.

Attendance Policy

Attendance in both lecture and lab are necessary and expected. Exams missed due to an excused (medical) absence must be made up within a week of returning to classes. It is each student's responsibility to be informed of exam dates, paper due dates, required course activities, etc. before making any travel plans during the semester.

Exams: You are expected to take the midterm exams at the scheduled time. If you are suddenly ill or there is an emergency, please contact me in advance or as soon as possible after the exam, by 9 am the next morning. Documentation of your emergency will be necessary. A final exam will be held during the last week of the semester and you must take the exam at the appointed time; please plan your travel accordingly.

Academic Honesty

Academic Integrity is a guiding principle for all academic activity at Pablo de Olavide University. Cheating on exams and plagiarism (which includes copying from the Internet) are clear violations of academic honesty. A student is guilty of plagiarism when he or she presents another person's intellectual property as his or her own.

Students committing acts of academic dishonesty shall be penalized by a failing grade for the assignment and a failing grade for the course.

Extra credit: Students will not have additional "extra credit" opportunities during the course semester; only the items listed in the course assessment table above will be used to calculate the grade. However, bonus questions may be offered on exams and assignments at the discretion of the Instructor.

Grading Scale (per UPO student handbook)

Grade Conversion Scale:

Spanish Grade:	10	9.5-9.9	9 - 9.4	8.5-8.9	8-8.4	7.5-7.9	7-7.4	6.5-6.9	6-6.4	5.5-5.9	5-5.4	0-4.9
U.S. grade:	A+	A	A-	B+	B	B	B-	C+	C	C	C-	F

Resources:

There are several resources available to you. In addition to my listed office hours, you can make an appointment to meet with me. I will hold extra office hours and/or tutorial sessions prior to midterm and exam dates as my schedule permits. We have also arranged for weekly tutorial sessions; please make a note of the session times once they are posted.

Your textbook is a fantastic resource, and for that reason, I have assigned reading sections and practice problems from the book. This material is meant to supplement, not replace, the lecture component, but I expect that you will read the assigned material and take it as seriously as

attending class. The assigned problems will not be graded, but I expect you to do them as they are an excellent way to learn the material and practice for midterm exams and your graded assignments.

Communication

The primary mode of communication will be through the WebCT. I will post most announcements for the class on this portal; e-mail will only be used if the message is urgent or highly important (e.g., class cancellation, typo in problem set). Lecture notes, answer keys for the problem sets and exams, extra practice problems and their answers, etc. will be posted on the WebCT in the appropriate folder. Grades WILL NOT be posted on the WebCT. Pertinent class dates have been entered in the The WebCT calendar function. If you need to contact me, please e-mail (preferred) or phone as listed above. I will reply at the earliest opportunity but please understand that it might not be right away as I am not always in my office!

Strategies for success

Organic Chemistry has a reputation as one of the most difficult classes that a student takes during their undergraduate career but it's not impossible; you can succeed and there are many ways in which to do that. The first is to recognize that the material is cumulative: what you learn in the early lectures is material that you will need to help you solve problems later in the course. You can't just compartmentalize it, instead you build on your knowledge throughout the course. For this reason, it is very important that you have a thorough understanding of the material covered in the early lectures and that you stay on top of the class. This takes both hard work and dedication. The second way to succeed is to pay attention to detail; what might seem to you like a negligible difference in chemical structure or reaction conditions can completely change the nature of the molecule or how it reacts, so it is very important on exams and assignments to make sure that you pay attention to the details of the question to arrive at the correct answer. In other words, make sure you say what you mean and mean what you say!

Most students find that the real key to success in Organic Chemistry is practice, practice, and more practice. The amount of material that is covered and the way that I teach both make it practically impossible to memorize the content of the course – plus, you don't learn nearly as much when you memorize and you certainly don't retain the material. On the other hand, working through lots of examples and doing as many practice problems as possible will help you to learn and remember the material. After a certain point, you will start to recognize patterns and get a feel for how molecules react – in other words, you will develop your chemical intuition. This takes longer for some than others, but don't be discouraged; stay focused and keep at it!

My teaching Strategies

There are a couple of different ways that I could teach this course: I could stand up at the front of the room and give you umpteen different reactions and molecules to memorize, or I could actually help you gain a fundamental understanding of Organic Chemistry. I prefer the latter approach; you will retain the material long after the course is completed (and will be able to apply it to your chosen field of study!) and you will develop your critical thinking skills. Unfortunately, there will be some things that you just need to memorize – there is no way around it. But I try to keep this to a minimum and strongly discourage you from trying to memorize everything that we will cover in class – it will be both overwhelming and unproductive. Instead, I hope that by taking the assignments seriously, completing the in-

chapter practice problems and using your dictionary as suggested, you will join me in thinking like an Organic Chemist and gain an appreciation for the subject.

Expectations

What I expect from you: I expect that you will have a thorough knowledge of the topics covered in CHE 110 (General Chemistry); this course is a pre-requisite, and if you are weak in some areas or feel you require a refresher, the onus is on you to get caught up ASAP, by your own. Specifically, I expect you to have an understanding of chemical bonding, Lewis structures, orbitals and electron configurations, VSEPR theory and intermolecular forces. We will briefly review these topics in relation to Organic Chemistry but you will have a much deeper appreciation for the material if you have a good understanding of the fundamentals from General Chemistry.

I expect you to stay on top of the material and not fall behind; you can accomplish this by regularly attending class, reviewing your lecture notes after class and making note of any trouble areas, and using your textbook to complement your lecture notes. You can also accomplish this by starting your assignments or studying for your exams early and not waiting until the last minute. Part of the “incentive” for staying on top of the material are the five “pop” quizzes that will be held during the semester.

I expect you to use the resources that I provide for you to your best advantage; this includes following up with answer keys to midterms or assignments, lecture notes or handouts that I put online, and completing the assigned problems from the text and/or extra problem sets that I make for you. This also includes attending tutorial sessions and visiting me during my office hours for extra help.

What you can expect from me: You can expect me to return your work to you as soon as possible and with as much feedback as I can provide; yes, it might be a lot of “red pen” but I’d rather explain to you why something is wrong, so that you can use this feedback to obtain the correct answer in the future. Please understand that I do most of my own grading and with the large number of students that I have, this sort of thorough grading can take some time.

You can expect me to communicate with you as much as possible: I try very hard to answer student e-mails quickly (although it helps if you are very clear and/or specific in what you are asking me!) and if there is any additional information or clarification about assignments or something we discussed in lecture, I will relay this information as soon as possible.

You can expect me to post lecture notes when applicable; I use a combination of chalkboard and Power Point as appropriate – I’ll post the Power Point notes online when I use them, and will try hard to have them available for you before class.

You can expect me to be committed to your success in this course; I will always make the extra effort to help you succeed in Organic Chemistry, but please remember that learning is a two-way street and that I expect you to be committed to your success, as well.

Creating an Organic Chemistry Dictionary

One common frustration that students have about Organic Chemistry is that there are “too many new terms to remember”. This is true; your vocabulary will expand significantly in this course, since in order to think like an Organic Chemist, you need to talk like an Organic Chemist. The objective in creating an Organic Chemistry dictionary is to provide you with a way to keep track of all of these new words, and to help you remember them. By having an organized volume, you will easily be able to look up a word that you can't quite remember, and the simple act of creating the dictionary will help you become more familiar with the terminology and examples.

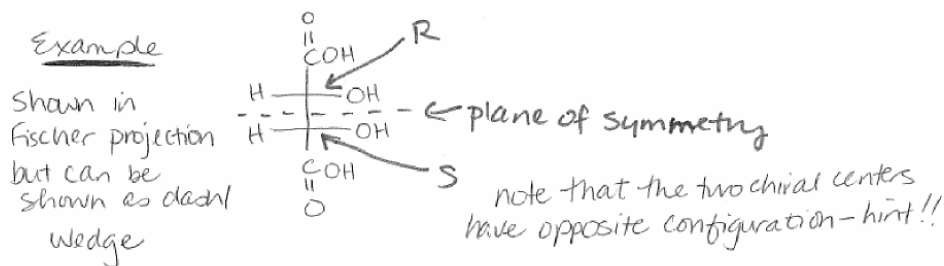
How to set up your dictionary: you will want to use a notebook of some sort - a coil-bound notebook with at least 50 pages is recommended (100 pages will definitely be more than enough!). Binders are not recommended as pages can be removed and lost. You will divide the notebook into alphabetical sections (A,B,C, etc.) and the amount of room that you will need per letter will depend on how much detail you include, how large you write and how many words fit in that section. At least two pages per letter are recommended. Be creative - use color to keep your dictionary organized and attractive, but also be sure to be scientifically accurate and thorough.

Each notebook entry should include a) the term, b) its definition, c) the date this term was introduced in class (so you can refer to your class notes), and d) the page or section in the book where it is introduced/defined. You must also include an example if relevant (for example, the term “Lewis structure” needs an example as does “conjugate base”, but something like “polarimeter” is hard to give an example for since it is a piece of equipment). You are welcome to include any additional information/personal hints/mnemonic devices that you think will be useful to you but be careful not to make it too cluttered.

Sample entry:

meso see section 7.5 (pg 233) in Hornback
+ class notes October 30th.

A meso compound is a special type of stereoisomer that contains 2 or more stereocenters but is not optically active since it possesses an ^{internal} plane of symmetry.



Remember: you are making this dictionary for you, so the more effort that you put into it, the more it will help you with the course. Have fun!