ORGANIC CHEMISTRY I Spring 2021 Syllabus (Online)
(Thursday from 9:30-11:00)

General Information

Lecturer: Dr. Ryan Murelli
Office: 437 New Ingersoll
Email (preferred contact method): rpmurelli@brooklyn.cuny.edu
Office Hours:* Tues 11-1:00am; Thursday, 8:00-9:00am (excluding exam and quiz days)
Phone: 617-943-3900 (In case of emergency only)

**Office hours are group sessions that are effectively an additional class/recitation that isn't mandatory and might conflict with your other courses. They will be held via Zoom link, and those that can attend are encouraged to. I will share a link to the recording with the class through blackboard. It is highly recommended that you either attend or watch these videos, as we will not be able to cover all the material during the scheduled course time.*

Statement of Course Goals:

The goal of the lecture component of Organic Chemistry I is to introduce students to fundamental concepts of organic chemistry. By the end of the semester, a successful student will:

1) *Have a firm grasp on the language of organic chemistry*
2) *Be able to successfully think about and explain chemical reactions through illustration of mechanisms.*
3) *Be knowledgeable of chemical reactions and be able to plan multi-step syntheses employing them*
4) *Be able to interpret spectroscopy and assign chemical structures using spectroscopic data*

Required Purchases For Lecture:

1. Organic Chemistry, 5-8th Edition by W. Brown, C.S. Foote, B.L. Iverson, E. Anslyn
   a. Reading assignments are from the 6th Edition. 8th Edition is most recent and may be more relevant for Organic II next semester depending on who instructor is, and could be worth it for that reason if you have the money. However, all additions follow very closely, and I would say get the hand-me-down version from a friend or the cheapest one you can find, and just pay attention to material you are reading and adjust accordingly.
2. Molecular Modeling Set (Highly Recommended)

Resources for Students:

1. There is a wealth of material on my website (http://userhome.brooklyn.cuny.edu/rpmurelli/course.html)

This includes:

a. *Recitation handouts*
b. *Old Exams and Quizzes**
c. *Some Powerpoint slides*
d. *Old and new lecture videos*
e. *Some links*

**You should try to use old quizzes and exams in exam and quiz-like atmospheres (timed, no books) to gauge where you are in your understanding of the material.*

2. Highly recommended tutorial/supplement: *http://masterorganicchemistry.com/organic-1/*
3. Library: Textbook, Solutions Manual & Molecular Models are on Reserve
4. Practice Problems on Prof. Horowitz' Website: http://userhome.brooklyn.cuny.edu/ghorowitz/
5. Online Video Tutorials: http://www.youtube.com/user/freelanceteach
6. Online Tutorials: http://ochem.jsd.claremont.edu/tutorials.htm#
7. Animations of Reaction Mechanisms: www.chemtube3d.com
8. Supplementary Problems Online:
   http://www.cem.msu.edu/~reusch/VirtualText/Questions/problems.htm
   http://www.mc.maricopa.edu/~minger/CHM235.htm, http://www.utdallas.edu/~scortes/ochem/
9. Prof. Horowitz Website:
   http://userhome.brooklyn.cuny.edu/ghorowitz/index.htm

How to Succeed In Organic Chemistry:

Organic Chemistry is notoriously difficult class for many students. I do not know how to get everyone to succeed, but I can offer the following advice that I think can be useful for some (hopefully most).

1. The course will be much easier with an understanding of reaction mechanisms, and impossible without one. Despite my attempts at drilling this home to students, it remains a significant challenge. I want you to all start learning arrow pushing/mechanisms as soon as possible, and try to get it to be second nature to you. Here are some online video resources to "get ahead" I found that I thought were nice:

Khan Academy
(www.khanacademy.org/science/organic-chemistry/alkenes-alkynes/alkene-reactions/v/introduction-to-reaction-mechanisms)

IUPUI Organic Chemistry
(http://www.youtube.com/watch?v=snz-3a4ux8c)

Prof. Jonathan Gough (Long Island University)
(http://www.youtube.com/watch?v=0JEyMYTKqCY, http://www.youtube.com/watch?v=LwFOPSItocc)

2. Set aside 10-15 hours per week of study time for the lecture component of this course. More time may be required, especially during first month or so.

3. Attend class religiously. I will try to put lecture videos online. Watch until you understand EVERYTHING.

4. Figures >>> Text. I cannot communicate research that well with my organic chemistry colleagues without a paper and pencil in hand. The reason is that organic chemistry is best understood with figures, structures, etc. When reading the textbook, I would suggest that you make the understanding of the textbook figures your primary objective, and simply use the text to help you in that pursuit. It is my opinion that reading the textbook from cover to cover the way you normally would read a book is not an efficient use of your time.

5. Along those lines, what is THE MOST valuable use of your time will be problem solving:

- Spend the majority of your study time doing problems, not reading.
- Do the assigned textbook problems plus problems posted on the Murelli and Horowitz websites.
- Practice each topic until you have mastered it. Don't stop just because you have completed the assigned problems.
- **Study with a partner or in a group.** Organic Chemistry cannot be mastered alone.
- Don't be afraid to ask for help. Get help immediately if you get stuck.

HOWEVER!!!! Practicing problems without knowing what you are doing is likely to lead to bad habits and be a waste of your time or worse. If you begin to practice problems just for the sake of practicing problems and you aren't learning anything, or you don't feel like you are understanding why you are doing what you are doing, you need to take a step back. THIS is why it is important that you make time for yourself to study Organic Chemistry for as much as is needed. Also, make sure you are getting feedback on your problems from someone that knows what they are doing.

Course Grade Breakdown:

Lecture/Recitation
Quizzes, 20% (Average of top 3 of 4)
Exams, 35% (Average of top 2 of 3)
Final Exam, 35%
Homework, 10% (Average of top 7 of 8)

KEY DATES

Dates of Quizzes and Exams

Quiz 1* – 2/18 (Topic: Gen Chem Basics, Line Angle Notation and IUPAC)
Quiz 2 – 3/4 (Topic: Hybridization and Stereochemistry)
Exam 1 – 3/11 (Through Newman and Chair Conformations)
Quiz 3 – 3/25 (NMR Spectroscopy)
Exam 2 - 4/15 (Exam 1 plus NMR, electron arrow pushing, and resonance)
Quiz 4 – 5/6 (Substitution/Elimination and Reactions of Alkenes and Alkynes)
Exam 3 – 5/13 (Organic Reactions and Synthesis)
Final Exam – Pending Release of Final Exam Schedule**

** Quizzes and Exams will be taken during the regularly scheduled class time via blackboard.*
*** We will go with whichever the earlier registration code is, either T9 or TR9.*

Homework Assignments are due by midnight on the following dates:

HW1.^ Wed, February 10th (Topics: Some Relevant General Chemistry Refreshers, Line-Angle Notation and IUPAC)
HW2. Wed. February 24th (Topics: Hydridization and Stereochemistry)
HW3. Sun March 7th (Topics: Newman and Chair Configurations)
HW4. Wed. March 17th (Topic: NMR spectroscopy and Electron Arrow Pushing)
HW5. Wed. April 14th (Topic: Electron Arrow Pushing and Substitution (SN1/SN2) Chemistry)
HW6. Wed. April 21st (Topic: Substitution and Elimination Chemistry)
HW7. April 28th (Topic: Reactions of Alkenes)
HW8. Sun, May 9th (Topic: Exam 3 Prep on Chemical Reactions and Multistep Synthesis)

^Homework assignments will be given via blackboard. You will have unlimited attempts at these assignments. The will be posted at least 1 week in advance of due date. Homework assignment questions will reflect the types of questions you will have on quizzes and exams.

Administrative Dates

https://www.brooklyn.cuny.edu/web/about/administration/enrollment/registrar/bulletins/spring21/calendar.php

Last day to add a course – *2/4*
Last day to drop a course without a W –*2/15*
Last day to file for summer/Sept 1 graduation – *3/15*
Last day to resolve fall 2020 incomplete grades –*5/3*
Last day to withdraw from a course with a W (non-penalty) grade –*5/17*

COURSE POLICIES AND PROCEDURES

Academic Integrity:
Academic dishonesty of any type, including cheating and plagiarism, is unacceptable at Brooklyn College. Cheating is any misrepresentation in academic work. Plagiarism is the representation of another person's work, words, or ideas as your own. Students should consult the Brooklyn College Student Handbook for a fuller, more specific discussion of related academic integrity standards. Academic dishonesty is punishable by failure of the "test, examination, term paper, or other assignment on which cheating occurred" (Faculty Council, May 18, 1954). In addition, disciplinary proceedings in cases of academic dishonesty may result in penalties of admonition, warning, censure, disciplinary probation, restitution, suspension, expulsion, complaint to civil authorities, or ejection. (Adopted by Policy Council, May 8, 1991.)

Students with Disabilities:
If you have a disability, it is the responsibility of the university to provide you with reasonable accommodations. You should first register with Ms. Stewart-Lovell, the Director of the Student Disability Services Center (718-951-5538). Then please provide me with a copy of your course accommodation form and if necessary please schedule an appointment with me to discuss your specific accommodation needs. *If you qualify to take your exam or quiz in the disabilities center, please contact me in advance. I will need email confirmation from the SDSC with accommodation qualifications, and will work with students individually on this.*

Absence from Examinations:
No make up examinations will be given to students who are absent from exams and quizzes, or who miss homework assignments. A missed assignment will count as a 0, which will be dropped. If multiple quizzes or exams are missed, and the student has valid excuses for both, please contact me. In the event of an absence from the final exam, students will receive an incomplete grade and they can take the exam on a scheduled makeup day the following semester (TBD). If a students misses that, they will receive a 0. No make-up final will be given to any student who is failing the course heading into the final.

Re-grade Requests: With the online, multiple choice format, re-grade requests will be moot. Occasionally a question may have a mistake to it that will require updating for all students. If a students feel there is a mistake - such as duplicate correct answer choices but only one counted - they can let me know via email or during office hours.

Recommendation Letters:
If you need or think that you may need a recommendation letter from me at some point in the future, regardless of when you need it, you should email me at the end of the semester to ensure a greater likelihood of accurate personal anecdotes in your letters. In addition, to ensure a stronger letter, you should make a point of coming to my office hours occasionally and participate so that I may know who you are.

COURSE SCHEDULE OF TOPICS

Topic	Tentative Dates	Reading and Practice Problems (6th Edition)
Drawing and Naming Organic Molecules	2/4	* Lewis Structures - **1.1-1.2** (This should be review from Gen Chem- See problems **1.6, 1.7, 1.20, 1.23, 1.24, 1.26-1.32** and if these are not easy for you, review until they are, and don't move on until it is) * Organic Chemistry Shorthand – **2.1-2.2** Organic shorthand is a critical skill, and it is important that you invest the time until you are comfortable with it. If the book and/or my lecture doesn't make sense, you can find several nice video tutorials online such as "Representing Structures of Organic Molecules" from Khan Academy. This is a skill you should **master** within the first week. - For some entry problems, see: **2.1, 2.2.** For a more thorough exercise, partner up with a friend or friends and come up with problems for one another that include heteroatoms and alkenes/alkynes) * Functional Groups – **1.3, Chapter 5 Intro** - I will not specifically discuss this vocabulary in class. Know the following key functional groups (Alcohol, Ether, Amine, Carbonyls (Ketone, Ester, Aldehyde, Carboxylic acid, Amide), Alkene, and Alkyne. * IUPAC - **2.1-2.4, 5.2A, 8.2A, 10.1B, 16.2A-B** **-** IUPAC naming is valuable but not essential for keeping up in the course. I will actually not cover it in detail in class, in part because it would take away time from other aspects that are more critical for you to learn. Spend some time learning IUPAC on your own (~ 3-4 hours) and practice before quiz 1 and exam. Examples of difficulty level of IUPAC questions can be seen on old quiz 1s and exams.
Secondary Structures of Organic Molecules	2/11	Bond Angles, Dipoles, Molecular Orbital/ Valence Bond Theory, and Hybridization – **1.4-1.7** Stereochemistry – **3.1-3.8**
Dynamic Configuration of Organic Molecules	2/18, 2/25	Newman and Chairs – **2.5-2.6**
Quiz 1	2/18	**Topics:** Relevant General Chemistry Basics, Line Angle Notation and IUPAC
NMR	3/4	Theory – **13.1-13.4** Interpretation – **13.5-13.12** *^{1}H NMR spectroscopy will be focus*
Quiz 2	3/4	**Topics:** Hybridization and Stereochemistry
Exam 1	3/11	**Topics:** All material throughNewman and Chairs (No NMR)
Electron Arrow Pushing and Resonance	3/18	

Quiz 3	3/25	**Topic:** NMR Spectroscopy and Electron Arrow Pushing
Substitution Reactions	3/25, 4/8	SN1 and SN2 reactions – **9.1-9.4**, **9.9,** Inductive Effect and Hyperconjugation – **6.3A** *Inductive effect and hyperconjugation is important for understanding stability of cations which is a strong factor in determining SN1 vs. SN2*
β-elimination	4/8	E1 and E2 – **9.5-9.7** Substitution vs. Elimination – **9.8**
Exam 2	4/15	**Topic:** NMR spectroscopy, electron arrow pushing, resonance, and substitution (SN1/SN2) Chemistry
Reactions of Alkenes	4/22, 4/29	Chapter 6
Reactions of Alkynes	4/29	Chapter 7
Organometallic Reactions	5/6	Gringard – **15.1A-C** Alkyl Lithium – **15.1A, 16.5B** Alkyl Cuprates – **15.2A-15.2C, 19.8E**
Radicals	5/6	**8.3D-8.8**
Quiz 4	5/6	**Topics:** Substitution/Elimination and Reactions of Alkenes and Alkynes
Exam 3	5/13	**Topics**: Chemical Reactions and Synthesis
FINAL EXAM	TBD	**Topics: Cumulative of Semester.** Available of Blackboard from 8am to 10 am.