ORGANIC CHEMISTRY FOR HEALTH AND NUTRITION
SPRING 2017

Lecturer: Dr. Gail Horowitz
Office: 5315 Old Ingersoll
It is tricky to find my office. You must first be in Old Ingersoll.
Then take the *CENTER* elevator or stairs to the 5th floor
Office Hrs: Mon & Tues: 11am-Noon, Wed & Thurs: 11am-1pm, or by appointment.
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Office Hrs:	By Appt	M, Tu, Th 8-9 am	Tues 1-2 pm	TBA	Fri 1-2 pm

1. Introduction to General, Organic, & Biochemistry by Bettelheim, Brown, Campbell, Farell (10^{th} or 11^{th} edition).
2. Organic Chemistry Laboratory: Health and Nutrition by Pavia, Lampman, Kriz et al., Custom Published Edition only, available in Brooklyn College Bookstore.
3. Composition Notebook
4. Lock for Lab Drawer

Course Grade Breakdown:

Lecture	*75%*	*Laboratory*	*25%*
Quizzes	30%	Prelabs & Postlabs	90%
Exam I	17.5%	Lab Notebook	10%
Exam II	17.5%		
Final Exam	35%		

APPROXIMATE Letter Grade:

> 87	~ A
> 80	~ B
> 72	~ C
> 65	~ D
< 65	~ F

Strategies for Success:
- Come on time to class & try not to miss class. It is difficult to learn the material on your own.
- Be an active participant in class.
- Don't go it alone. Study with friends or form a study group.
- Pretend this is a math class. Spend most of your study time doing problems. Being able to solve problems is key!
- Do a little bit of problem solving every day. Don't cram.
- Don't be shy! Seek help if you are struggling (lecturer, lab instructors, learning center, etc.)

Resources to Help You Succeed in This Course:
Weekly Problem Sessions with Dr. Horowitz, Mon 1-2 pm, 0308 Ingersoll (basement level)
Tutors in Learning Center, 1300 Boylan Hall: Hours TBA
Private Tutors: Names & contact info available upon request
My Website: Problem Sets, Sample Quizzes & Exams, Lab Materials
Blackboard: Answers to Even Numbered Textbook Problems, Powerpoint Slides from Textbook

LECTURE SCHEDULE

Topic (From 11th Edition)	**Tentative Dates**	**Assigned Homework (From 11th Edition)**
Introduction to Course: 10.1, 10.2 Lewis Structures: 3.2, 3.7 Condensed Structural Formulas: 11.2 Constitutional Isomers: 11.3	1/30	 3.59, 3.62a-d, g-h, 3.64, 10.15-10.18, 10.20, 10.30
Line Bond Notation: 11.2 Nomenclature: 11.1, 11.4, 11.6, 11.8	2/1	11.14-11.15, 11.18-11.21, convert 12.19, 12.20, 12.24b,c,g to Lewis, convert 12.24d-f, 12.25c-d to line bond 11.28a-c,f, 11.29a-d,g-h, 11.36, 11.37, 11.52, 11.67
Functional Groups: 10.4 VSEPR: 3.10, 10.3 Intermolecular Forces: 5.7	2/6	10.34-10.38, 10.44, 10.52, , 14.12a,d,f, 14.14b-c, e-f, 17.19a,b, 18.7a,c, 18.8c 3.80, 3.83, 3.84, 10.24, 10.25, 10.41,10.51 5.61a, c, e, h, k-o, 5.62, 5.64, 5.65, 5.66
Cycloalkane Conformers:11.7	2/8	11.38, 11.70-11.72 + *Cyclohexane Handout*
Formal Charges: NA	2/15	*Calculating Formal Charge Handout*
Quiz I: **3.2, 3.7, 3.10, 5.7, 10.3, 10.4, 11.1-11.4, 11.6-11.8**	**2/22**	
Resonance, Arrow Pushing: 3.9	2/22	3.76-3.78 + *Resonance Handout*
Alkenes and Alkynes: Chapter 12	2/27, 3/1	12.19, 12.20, 12.22, 12.24, 12.25, 12.30, 12.35a,b,d, 12.37, 12.41, 12.42, 12.46-12.48, 12.50, 12.56, 12.59, 12.72
Quiz II: **Formal Charges, 3.9, 11.7**	**3/1**	
Aromatics: 13.1, 13.4	3/6	13.26, 13.30, 13.31
Alcohols & Ethers: Chapter 14	3/8	14.9, 14.10, 14.16-14.18, 14.25, 14.28, 14.33-14.38. 14.54, 14.61, 14.70
Chirality: 15.1, 15.4-15.5	3/13	15.10, 15.11, 15.13-15.17, 15.19, 15.20, 15.23
Exam I: Chapters 10 thru 14 plus sections 3.2, 3.7, 3.9, 3.10, 5.7	**3/15**	

Topic (From 11th Edition)	**Tentative Dates**	**Assigned Homework (From 11th Edition)**
Chirality Cont: 15.2	3/20	*Identifying Chiral Centers Handout: Find R/S for all Chiral Centers*
Chirality Cont: 15.3	3/22	15.22, 15.24-15.26, 15.35, 15.37, 15.42a, 15.43a *Relationships btwn Molecules Handout*
Aldehydes/Ketones: Chapter 17 omit 17.5	3/27, 3/29	17.13, 17.31-17.33, 17.35, 17.37, 17.38, 17.40, 17.48-17.52, 17.57, 17.58, 17.61, 17.71, 17.74, 17.75
Quiz III: Chapter 15	**3/29**	
Carboxylic Acids: Chapter 18 omit 18.5E	4/3, 4/5	18.18, 18.19, 18.24, 18.25, 18.29, 18.41, 18.42, 18.44, 18.45, 18.47, 18.50
Quiz IV: Chapter 17	**4/5**	
Anhydrides, Esters, Amides: Chapter 19	4/19, **Thurs** 4/20	19.7, 19.8, 19.10, 19.11, 19.17, 19.19, 19.20, 19.22, 19.33, 19.35-19.37, 19.39, 19.42, 19.43, 19.45
Carbohydrates: Chapter 20	4/24	20.13, 20.15, 20.20-20.23, 20.26, 20.27, 20.31, 20.36, 20.39-20.42, 20.49, 20.50, 20.57, 20.64, 20.66, 20.69
Exam II: Chapters 15, 17, 18, 19	**4/26**	
Carbohydrates Cont: Chapter 20	5/1	
Lipids: Chapter 21	5/3	21.5, 21.13, 21.15, 21.18, 21.19, 21.32, 21.40, 21.43, 21.46, 21.49, 21.61, 21.80, 21.81, 21.84, 21.91, 21.92, 21.94
Quiz V: Chapter 20	**5/8**	
Proteins: Chapter 22, omit 22.10	5/8, 5/10	22.36, 22.37, 22.27, 22.30, 22.42, 22.63, 22.89
Quiz VI: Chapters 21, 22 (1rst half)	**5/15**	
Nucleotides/Nucleic Acids: Chapter 25 **25.1-25.4 only**	5/15	25.6, 25.7, 25.13, 25.14, 25.19, 25.20, 25.23, 25.24, 25.30, 25.37
Review	5/17	
Final Exam: All Chapters	**5/22 8AM**	

LABORATORY SCHEDULE

Lab	Experiment	Required Reading	M	Tu	Th
1	Check-in, Safety Video, Safety Experiment	Pgs. 2-17, 19-24	1/30	1/31	2/2
2	Aspirin Synthesis (Recryst, Mpt)	Pgs. 30-32, 85-93, 123-125	2/6	2/7	2/9
3	Spinach Separation (TLC)	Handout* plus pgs. 114-119	**Wed** 2/15	2/14	2/16
4	Spinach Separation (Column Chrom)	Handout* plus pgs. 101-111	2/27	2/21	2/23
5	Tylenol Synthesis	Pgs.127-129	3/6	2/28	3/2
6	Caffeine from Tea Procedure A (Extract, Reflux)	Pgs. 67-69, 77-79, 131-134	3/13	3/7	3/9
7	Caffeine from Tea Procedure A (Distil)	Pgs. 35-37, 47-49	3/20	3/14	3/16
8	Benzocaine Synthesis	Pgs. 73-75, 139-140	3/27	3/21	3/23
9	Soap Synthesis	Handout*	4/3	3/28	3/30
10	Ethanol from Corn	143-146	**Thu** 4/20	4/4	4/6
11	Ethanol from Corn	143-146	4/24	4/25	4/27
12	Sugars	147-157	5/1	5/2	5/4
13	Sugars	147-157	5/8	5/9	5/11
14	Check-out: No Experimental Work **SUBMIT LABORATORY NOTEBOOK**		5/15	5/16	5/18

* Handouts are available on Professor Horowitz's website.

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.

Absence from Quizzes:

Six quizzes will be administered over the course of the semester. The lowest two scores of the six will be dropped. No makeup quizzes will be administered. Any missed quiz (regardless of the reason) will be assigned a score of zero.

Absence from Examinations:

No make up examinations will be given to students who are absent from lecture examinations. Students who miss one exam **with a valid excuse** will be assigned a score for the exam missed on the basis of their performance on the other lecture exam and on the final. A grade of zero for lecture will be given if both lecture exams are missed.

In the event of absence from the final exam, students **with a valid excuse** will be given a grade of INC and scheduled to take a makeup final the following semester. No makeup finals will be given to students whose overall course average before the final exam is less than 50%.

Regrade Policy:

Any student wishing a re-evaluation of an exam question must submit a signed, regrade request form (available on my website) within two weeks of the return of the quiz or examination. A scanned in electronic copy of the quiz or exam will be utilized to re-evaluate your paper.

Laboratory Instructions and Regulations:

Safety is number 1 priority in lab. You will be provided with an approved pair of safety goggles. **Wearing goggles at all times in the laboratory is mandatory.** If you are caught not wearing goggles in the lab, you will be asked to leave and you won't be allowed back for that session.

During the first laboratory session, you will receive 2 copies of a hand-out of safety rules. One is for you to keep and the other one is for you to sign and to return to your lab instructor. You must read, understand and agree to abide by these rules if you want to take the course.

Please follow the check-in and check-out instructions given by the senior college laboratory technician, Ms. Anna Belyayeva. Make sure that you clean your glassware and bench space everyday (with solvent if necessary) and that you return all your glassware and equipment to your laboratory drawer before you leave. **Make sure you lock your drawer at the end of every lab period.** At the end of the semester, you will be charged for the replacement cost of any missing or broken items.

If a student misses a lab, the lab must be made up promptly (ideally with another section that is conducting the same experiment). Lab makeups will only permitted for legitimate reasons (e.g. family emergency, illness, religious holiday, etc.) and students may be required to submit documentation to verify their reasons for absence from laboratory.

If you miss a lab, you must get permission from your lab instructor to makeup the experiment. In order to do this, please pickup a makeup form from the stockroom and ask your instructor to sign it. Then, schedule and arrange your makeup date by contacting the instructor teaching the makeup section (see contact information on page 1). After you complete the makeup experiment, please have the makeup instructor sign your makeup form so that credit can be given to you for having completed the experiment.

LABORATORY REPORTS AND NOTEBOOKS

You will be required to submit a prelab and postlab for each experiment. You will also be required to keep a laboratory notebook which you will turn in at the end of the semester. The instructions below describe what should be included in your prelab, postlab and notebook.

Prelabs 2 pts
Prelabs are due promptly at the start of lab. Late prelabs will not be accepted.

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1. Table of Chemicals Used
The table of chemicals should list all known chemicals that will be used, including solvents. List any hazards associated with each chemical.

2. Procedure
Summarize the procedural steps you will carry out.

Laboratory Notebook
You must purchase a composition style notebook (a hard bound book, not a spiral). All data collected in the laboratory must be recorded directly in this notebook. Each experiment's data should be recorded on a separate page. Each page should be headed with the title of the experiment and the date in which the data was collected.

Postlabs 8 pts
Postlabs are due one week after completion of an experiment and are due promptly at the start of lab. If a lab report is submitted 1 day late, a 10% penalty will be applied. If a report is submitted more than one day late (up to 1 week late), a 20% penalty will be applied. Reports submitted more than one week after they are due will receive no credit.

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1. Observations (2 pts)
List two to three <u>important</u> observations that were made during the lab.

2. Data (2 pts)
List any data that you have obtained and report % recovery or % yield when applicable.

3. Post-lab Question (4 pts)
Answer the appropriate post-laboratory question given below.

Aspirin (due week 4): Was the product you obtained pure? How do you know?
Spinach (due week 5): Why did the beta carotene travel the fastest?
Tylenol (due week 7): Was the product you obtained pure? How do you know?
Caffeine (due week 8): If the average tea bag contains about 1.5 grams of leaves and about 40 mg of caffeine, how successful were you in isolating the caffeine from your tea bags?
Benzocaine (due week 9): Why is benzocaine soluble in aqueous acid, but not in aqueous base?
Soap (due week 10): Why is soap less effective in "hard" water?
Ethanol (due week 12): Why is it impossible to obtain pure ethanol in this experiment?
Carbohydrates (due week 14): Identify your unknown and briefly explain how you determined its identity.