

**ORGANIC CHEMISTRY FOR HEALTH AND NUTRITION  
SPRING 2014**

**Lecturer:** Dr. Gail Horowitz

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**Office Hours:** Monday, Wednesday 11:15-12:30 (or by appointment/drop-in).

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<b>Lab</b>	Ms. Domzalski	Ms. Ghogare	Dr. FernandezG	Dr. Kopkalli
<b>Instructors:</b>				
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<b>Office Hours:</b>	Mon 1:30-2:30	Wed 5:30-6:30	Wed 1:30-2:30	Wed & Thurs 1-2

**Required Purchases:**

1. Introduction to General, Organic, and Biochemistry by Bettelheim, Brown, Campbell, Farrell (any recent edition ok).
2. Solutions Manual for Introduction to General, Organic, and Biochemistry by Bettelheim et al. (any recent edition ok).
3. Organic Chemistry Laboratory: Health and Nutrition by Pavia, Lampman, Kriz et al., Custom Published Edition only, available in Brooklyn College Bookstore.
4. Composition Notebook
5. Lock for Lab Drawer

**Course Grade Breakdown:**

Lecture 75%

Quizzes 30%

Exam I 17.5%

Exam II 17.5%

Final Exam 35%

Laboratory 25%

Prelabs & Postlabs 90%

Lab Notebook 10%

**Strategies for Success:**

- Come to class on time.
- Be an active participant in the class.
- Don't go it alone. Study with friends or form a study group.
- Spend most of your study time doing problems, not reading the book. Being able to solve problems is key!
- Don't be shy! Seek help if you are struggling (lecturer, lab instructors, learning center, etc.)

## LECTURE SCHEDULE

Topic (From 10 <sup>th</sup> Edition)	Tentative Dates	Assigned Homework (From 10 <sup>th</sup> Edition)
Introduction to Course: 10.1, 10.2 Lewis Structures: 3.2, 3.7 Condensed Structural Formulas: 11.2 Constitutional Isomers: 11.3	1/27	3.59, 3.62, 3.64, 10.15-10.18, 10.20, 10.30
Line Bond Notation: 11.2 Nomenclature: 11.1, 11.4, 11.6, 11.8  Functional Groups: 10.4	1/29	- 11.14-11.15, 11.18-11.21 - 11.24, 11.28, 11.29a-d, g-h, 11.37, 11.38, 11.53, 11.68 - 10.34-10.38, 10.44, 10.52
VSEPR: 3.10, 10.3 Alkane & Cycloalkane Conformers: 11.7	2/3	- 10.24, 10.25, 10.41, 10.51 - 11.32, 11.39, 11.71-11.73
Properties & Reactions of Alkanes: 11.5, 11.9-11.11	2/5	11.51, 11.60-11.62
<b>Quiz I: 3.2, 3.7, 3.10, 10.3, 10.4, 11.1-11.4, 11.6-11.8</b>	<b>2/10</b>	
Formal Charges: NA Resonance, Arrow Pushing: 3.9	2/10	- <i>Calculating Formal Charge Handout</i> - 3.76-3.78 + <i>Resonance Handout</i>
Alkenes and Alkynes: Chapter 12	2/19	12.19, 12.20, 12.22, 12.24, 12.25, 12.30, 12.35, 12.37, 12.41-12.43, 12.46-12.48, 12.50, 12.53, 12.56, 12.68
<b>Quiz II: Formal Charges, 3.9, 11.5, 11.9-11.11</b>	<b>Th 2/20</b>	
Alkenes and Alkynes Cont: Chapter 12	<b>Th2/20</b>	
Aromatics: Chapter 13	2/24	13.14a,b,e,h, 13.23, 13.26, 13.30, 13.31, 13.39, 13.53, 13.55
Alcohols & Ethers: Chapter 14	2/26	14.9, 14.10, 14.12, 14.14, 14.16-14.18, 14.25, 14.28, 14.33-14.38. 14.53, 14.60, 14.69
Chirality: 15.1-15.2, 15.4-15.5	3/3	15.10, 15.11, 15.13-15.17, 15.19, 15.20, 15.22-12.25 <i>Identifying Chiral Centers Handout: Find R/S for all Chiral Centers</i>
<b>Exam I: Chapters 4, 10 thru 14</b>	3/5	<b>EXAM GIVEN IN ROOM 148 NE</b>

<b>Topic (From 10<sup>th</sup> Edition)</b>	<b>Tentative Dates</b>	<b>Assigned Homework (From 10<sup>th</sup> Edition)</b>
Chirality Cont: 15.3	3/10	15.26, 15.35, 15.37, 15.42a, 15.43a
Amines: Chapter 16	3/12	16.13, 16.17, 16.23, 16.27, 16.30, 16.33, 16.35, 16.42, 16.43, 16.59
<b>Quiz III: Chapter 15</b>	<b>3/17</b>	
Aldehydes/Ketones: Chapter 17	3/17, 3/19	17.13, 17.19, 17.20, 17.31-17.33, 17.35, 17.37, 17.38, 17.40, 17.44, 17.45, 17.48-17.52, 17.56, 17.57, 17.60, 17.70, 17.71, 17.73, 17.74
Carboxylic Acids: Chapter 18	3/24, 3/26	18.7, 18.8, 18.11, 18.18, 18.19, 18.24, 18.25, 18.29, 18.42, 18.44, 18.45, 18.47, 18.50
Anhydrides, Esters, Amides: Chapter 19	3/31, 4/2	19.7, 19.8, 19.10, 19.11, 19.17, 19.19, 19.20, 19.22, 19.33, 19.35-19.37, 19.39, 19.40, 19.42, 19.43, 19.45
Carbohydrates: Chapter 20	4/7	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, 20.77, 20.78
<b>Exam II: Chapters 15 thru 19</b>	<b>4/9</b>	<b>EXAM GIVEN IN ROOM 148 NE</b>
Carbohydrates Cont: Chapter 20	4/23	
Lipids: Chapter 21	4/28, 4/30	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
Proteins: Chapter 22, omit 22.10	5/5	22.26, 22.30, 22.31, 22.37, 22.38, 22.40, 22.42, 22.59, 22.85
<b>Quiz IV: Chapters 20, 21</b>	<b>5/7</b>	
Proteins Cont: Chapter 22	5/7	
Nucleotides/Nucleic Acids: Chapter 25 <b>25.1-25.4 only</b>	5/12, 5/14	25.6, 25.7, 25.13, 25.19, 25.20, 25.23, 25.24, 25.30, 25.31, 25.37
<b>Quiz V: Chapter 22</b>	<b>5/14</b>	
<b>Final Exam: All Chapters</b>	<b>5/21 8 AM</b>	

## LABORATORY SCHEDULE

Lab	Experiment	Required Reading	M	W	Th
1	Check-in, Safety Video, Safety Quiz	Pgs. 2-17, 19-24	1/27	1/29	1/31
2	Aspirin Synthesis (Recryst, Mpt)	Pgs. 30-32, 85-93, 123-125	2/3	2/5	2/7
3	Spinach Separation (TLC)	Handout* plus pgs. 114-119	3/10	2/19	2/14
4	Spinach Separation (Column Chrom)	Handout* plus pgs. 101-111	Th 2/20	2/26	2/21
5	Tylenol Synthesis	Pgs.127-129	2/24	3/5	2/28
6	Caffeine from Tea (Extract, Reflux)	Pgs. 67-69, 77-79, 131-134, 139-140	3/3	3/12	3/7
7	Caffeine from Tea (Distil)	Pgs. 35-37, 47-49	3/10	3/19	3/14
8	Benzocaine Synthesis	Pgs. 73-75	3/17	3/26	3/21
9	Soap Synthesis	Handout*	3/24	4/2	3/28
10	Ethanol from Corn	143-146	3/31	4/9	4/4
11	Ethanol from Corn	143-146	4/7	4/23	4/11
12	Sugars	147-157	4/28	4/30	4/25
13	Sugars	147-157	5/5	5/7	5/2
14	Check-out: No Experimental Work <b>SUBMIT LABORATORY NOTEBOOK</b>		5/12	5/14	5/9

\* 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:**

A minimum of five quizzes will be administered over the course of the semester. The lowest score of the five will be dropped. 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 must apply to the Academic Advisement Center for permission to take a make up final examination given during 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 instructions regarding check-in and check-out given by the senior college laboratory technician, Ms. Anna Belyayeva. Make sure that you clean your glassware and bench space everyday and that you return all your glassware and equipment to your laboratory drawer before you leave. Report any missing or broken items to Ms. Belyayeva.

If you miss a lab, please follow the following procedure in order to makeup the experiment. Pick up a makeup form from the stock room and ask your instructor to sign it. Check with the makeup instructor to make sure there is room for you to work in his or her laboratory. Have the makeup instructor sign the 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**

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#### **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.*

#### **Procedure**

*Summarize the procedural steps you will carry out.*

### **Laboratory Notebook**

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*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**

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#### **Observations (2 pts)**

*List two to three important observations that were made during the lab.*

#### **Data (2 pts)**

*List any data that you have obtained and report % recovery or % yield when applicable.*

#### **Post-lab Question (4 pts)**

*Answer the appropriate post-laboratory question given below.*

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Aspirin (due week 3): Was the product you obtained pure? How do you know?

Spinach (due week 5): Why did the beta carotene travel the fastest?

Aspirin (due week 6): 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.