Instructor
Cindy Graham Brittain, PhD
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Office Hours: W and F 9:00 AM – 11:00 AM, T and Th 1:30 PM – 3:00 PM

Lecture Textbook
Chemistry for Today: General, Organic, and Biochemistry, Fifth Edition
Authors: Spencer L. Seager & Michael R. Slabaugh
Available at campus (and other) bookstores, or online at iChapters.com
Content: Chapters 11 – 20 will be covered this semester (Chapter 21, time permitting)

OR
Organic and Biochemistry for Today, Fifth Edition
Authors: Spencer L. Seager & Michael R. Slabaugh
Available at campus (and other) bookstores, or online at iChapters.com
Content: Chapters 1 – 10 will be covered this semester (Chapter 11, time permitting)

Class Meetings
T Th 3:30 PM – 4:45 PM Pastore 124

Grading Policy
The course grade will be based on the following:
- 3 Quizzes (10% each) 30%
- Written assignment (‘Structure Determines Function’) 10%
- Midterm Exam (comprehensive) 25%
- Final Exam (comprehensive, all semester) 35%

100%

Four quizzes will be given during the semester; the lowest quiz grade will be dropped, and the remaining three quizzes will each count as 10% of the total grade. All students MUST adhere to the quiz and exam schedule specified on the syllabus (the single exception: students with a documented need for private testing or additional time). NO MAKE-UP QUIZZES WILL BE GIVEN; if a student is absent on a quiz day, that quiz grade will be dropped. A make-up midterm or final exam will be given if the circumstances for the absence can be fully explained and documented within one class period of the absence. If the campus is closed due to winter weather (or other unexpected event) on the day of a quiz or exam, students should assume that the quiz/exam will be given at the next class meeting.

Unless otherwise specified, the quiz and exam questions will be short answer, essay, and problem-solving. Students will have approximately 30-45 minutes to take each quiz, and the full lecture period to take the midterm exam. Quiz and exam questions will come directly from the content presented and discussed in lecture, and many questions may be similar to the recommended problems in the textbook. Students should work these problems as practice for answering quiz and exam questions. It is those students who practice solving problems that have the greatest success in the course. In all course work, students who do not adhere to the University’s policy on academic honesty will be held accountable.

Lecture Attendance and Preparation
Lecture class meets only 2 ½ hours each week, so students should plan for study time outside of class. A rule of thumb for most chemistry courses: students should expect to study two to three hours outside of class for every one hour in lecture (this means 5 to 7.5 hours of study each week). It is highly recommended that students prepare to participate in each lecture by:
• Reviewing the previous lecture material (flashcards are particularly useful for learning organic chemistry)
• Working the assigned problems related to the lecture topics
• Studying the upcoming material in the textbook

Students who haven’t prepared to participate in lecture may not benefit as much as those students who have prepared. **Consistent lecture attendance is ESSENTIAL for success in this course: the most significant mistake a student can make in this course is skipping a lecture (or being inattentive during lecture).** In the event that a student must miss a lecture, it is the student’s responsibility to obtain the missed lecture content, hand-outs, and announcements.

**DO NOT FALL BEHIND IN THIS COURSE! Every new concept will build on concepts that students should have previously mastered in this course (or in the pre-requisite course: CHM 101/112 or CHM 103). Students must take responsibility for reviewing those concepts as needed.**

**Study Help Resources**

• Dr. Brittain, via office hour visits, email, and/or telephone.

• Graduate student teaching assistants in the TA Help Office, Pastore 215. Note that not all TAs can provide help with all courses, and students seeking help should refer to the schedule of office hours posted at the door.

• Tutors at the Academic Enhancement Center (AEC). The AEC in Roosevelt Hall offers a comfortable environment in which to study alone or in groups, with or without a tutor. AEC tutors are fellow students who have taken the courses, and they can answer questions, clarify concepts, check for understanding, and help with study. Make an appointment or walk in during office hours: M – TH (9 AM – 9 PM), F (9 AM – 1 PM), and Sun (4 PM – 8 PM). For a complete schedule (including when tutors are available specifically for this class), go to [www.uri.edu/aec](http://www.uri.edu/aec), call (401) 874-2367, or stop by the fourth floor in Roosevelt Hall.

**Academic Honesty**

Academic dishonesty in any form is considered a serious offense, and disciplinary action will be taken immediately. The university’s policy on academic honesty is detailed in the student handbook (available online), and it is summarized below:

Students are expected to be honest in all academic work. A student’s name on any written work, including assignments, lab reports, internship reports, papers, or examinations, shall be regarded as assurance that the work is the result of the student’s own thought and study. Work should be stated in the student’s own words, and produced without assistance or properly attributed to its source. When students are authorized to work jointly, group effort must be indicated on the work submitted.

The following are examples of academic dishonesty:

• Unauthorized communication during exams.
• Unauthorized use of another’s work or preparing work for another student.
• Taking an exam for another student.
• Altering or attempting to alter grades.
• The use of notes or electronic devices such as calculators, computers, or cell phones to gain an unauthorized advantage during exams.
• Fabricating or falsifying facts, data, or references.
• Facilitating or aiding another’s academic dishonesty.

When there is an allegation of academic dishonesty, the instructor may:

• Fail the student for the assignment.
• Recommend that the student fail the course.
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<th>TUESDAY</th>
<th>THURSDAY</th>
<th>CHM 126 LABORATORY (for those enrolled in CHM 126)</th>
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Chapter 11: Organic Compounds ~ Alkanes | 1/25:  
Chapter 11: Organic Compounds ~ Alkanes | Course Information  
Check-in to Equipment Drawers  
MANDATORY Dry Lab 1: Laboratory Safety |
| 2     | 1/30:  
Chapter 12: Unsaturated Hydrocarbons ~ Alkenes, Alkynes, Aromatics | 2/1:  
Chapter 12: Unsaturated Hydrocarbons ~ Alkenes, Alkynes, Aromatics | Dry Lab 2: Organic Compounds ~ Structure, Isomerism and Nomenclature of Hydrocarbon Molecules |
| 3     | 2/6:  
Chapter 13: Alcohols, Phenols, and Ethers | 2/8:  
Chapter 13: Alcohols, Phenols, and Ethers  
QUIZ 1 | Wet Lab 1: Purification of Acetanilide by Recrystallization |
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Chapter 13: Alcohols, Phenols, and Ethers | 2/15:  
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Chapter 14: Aldehydes and Ketones | 2/22:  
Chapter 15: Carboxylic Acids and Esters | Wet Lab 3: Separation of Spinach Pigments by Thin-Layer Chromatography |
| 6     | 2/27:  
Chapter 15: Carboxylic Acids and their Derivatives | 3/1:  
Chapter 15: Carboxylic Acids and their Derivatives  
QUIZ 2 | Wet Lab 4: Synthesis of Cyclohexene by Dehydration of Cyclohexanol |
| 7     | 3/6:  
Chapter 16: Amines and Amides | 3/8:  
MIDTERM EXAM | Wet Lab 5: Synthesis of Aspirin |
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Chapter 16: Amines and Amides | Wet Lab 6: Synthesis of Nylon (Polyamide) |
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SPRING BREAK | SPRING BREAK |
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Chapter 17: Carbohydrates  
QUIZ 3 | Wet Lab 7: Organic Functional Group Analysis |
| 11    | 4/3:  
Chapter 17: Carbohydrates | 4/5:  
Chapter 18: Lipids | Wet Lab 8: Preparation of Esters and Soap |
| 12    | 4/10:  
Chapter 18: Lipids | 4/12:  
Chapter 19: Proteins | Wet Lab 9: Characterization of Carbohydrates  
LABORATORY FINAL EXAM  
Submit Lab Notebook for grading  
Course/TA Evaluation  
Check-out of Equipment Drawers |
| 13    | 4/17:  
Chapter 19: Proteins | 4/19:  
Chapter 19: Proteins  
QUIZ 4 | |
| 14    | 4/24:  
Chapter 20: Enzymes | 4/26:  
Chapter 20: Enzymes | |
| 15    | 5/1:  
READING DAY  
Probable Help Session to prepare for Final Exam | | |
| 16    | 5/8:  
FINAL EXAM  
3:00 PM – 6:00 PM | | |
CHM 124 Writing Assignment: Structure Determines Function

Due Date: Last Day of Classes (Monday, April 30th) or Reading Day Review (8 AM on Tuesday, May 1st)

Assignment: Select an organic molecule that is of interest to you – perhaps because it’s relevant to your major field of study, important to you personally (ex: a prescribed medication), or of topical interest to the general public (ex: melamine, the toxic ingredient in the Chinese wheat-gluten that was used in pet-food products). You should pick a molecule that you are curious enough about that you want to investigate it, and figure out how its molecular structure determines its function. Your job is to present to me the structure of your molecule, and then use concepts that you learned this semester to explain what it is about the molecule’s structure that is responsible for its function/behavior.

Approach: Draw the structure of the molecule, and identify all of the organic functional groups in its structure that we studied in this course (ex: alkene, benzene ring, alcohol, aldehyde, carboxylic acid, amine, etc). For peptide chains, you can simply list the primary structure of the peptide (the order of amino acids and the location of any disulfide linkages). If the molecule has any ionizable groups (carboxylic acids and/or amines), list their \( K_a \) (\( K_b \), or \( pK_a \)) values.

List all of the intermolecular attractive forces that the molecule is capable of using (ionic bonds, hydrogen bonds, dipole-dipole, or IDDI) as a result of the various functional groups it contains. Realize that if your molecule functions by binding to an enzyme or other receptor, it would fit lock-and-key into this binding site by using these intermolecular attractive forces.

List any physical properties that you can find for your molecule, such as solubility, melting point, boiling point, or octanol-water partition coefficient. Is it a solid, liquid, or a gas? Is it more water-soluble or more lipid-soluble? Explain these physical properties on the basis of your molecule’s intermolecular interactions. Looking at its structure, would you expect it to be a high-melting solid? Only slightly water-soluble? Is it sufficiently lipid-soluble that it can cross the blood-brain barrier and cause central nervous system effects?

If your molecule contains a chiral carbon, do the different enantiomers (mirror image molecules) have different functions? Is there more than one chiral carbon? Are there any diastereomers?

Explain what the key function of the molecule is, and perhaps why you find this molecule to be so fascinating. And then, as well as you can, try to use the concepts that you learned in this course to explain how the molecule’s structure causes it to function the way it does. Does it use one of the organic functional group chemical reactions that we learned? Or does it simply use intermolecular attractive forces to bind reversibly to a receptor and trigger a response? What is the response? Does it activate? Does it inhibit? Does it change pH? Is it toxic? What is the mechanism of its action?

Length: Approximately two pages (perhaps 12 point font, single-spaced, with a double space between paragraphs). Definitely more than one page, please but not (much) more than two pages. Remember, I have to read and grade over 180 of these papers.

About half of the first page will likely be taken up by the structure of your molecule with all of its functional groups labeled. You might be able to do some bullet-point listing of the various physical properties. You might be able to show a chemical reaction with names and/or structures. You might be able to include a sketch of a receptor or a metabolic pathway. But then much of the discussion of how “structure determines function” would probably be written paragraph-style.