

CHEMISTRY 1102/1152 – Organic Chemistry for Nurses and Liberal Arts

Spring TTH 4:00-5:15 pm, Aderhold Learning Center 5

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Office Hr: 11:00 – 11:45 am Tues. & Wed., 8:30-9.30am Thurs.

Prerequisite: Successful completion of Chem 1151

Required Text: John McMurry, et. al., “Fundamentals of Organic and Biological Chemistry”, Vol. 2

Attendance is required Unexcused absences will affect your grade. All students are expected to attend all lecture sessions. However, it is recognized that emergencies may arise which will necessitate absences from class. A student should notify the instructor if an absence is due to illness or other emergency. Students are responsible for all material covered in lecture if absent. Make-up exams are not given, regardless of the reason an exam was missed. If a student misses an exam and presents the instructor with an acceptable excuse, the grade on that exam will be dropped. Please note this can happen only once. Since absence and tardiness can affect your grade, giving false information regarding absences or tardiness is a violation of the Georgia State Academic Honesty Code. The instructor must be notified by the day of the exam that the student will not be present and must be given the reason for the absence. If the excuse is not considered acceptable, the exam grade will be a zero. It is up to the instructor to make the determination as to whether an excuse is acceptable. In general, illness or an emergency situation is the only acceptable excuses for missing an exam. Missing an exam also counts as an absence in the course.

NOTICE: Falsification of information regarding absences is a breach of academic integrity and a violation of the Georgia State Academic Honesty Code.

GSU Policy Regarding Student Conduct and Integrity: The Georgia State Policy on Academic Honesty is in force in this course, including but not necessarily limited to, infractions in the area of Plagiarism, Cheating on Examinations, Unauthorized Collaboration, Falsification and Multiple Submissions: The Student Handbook, available to all members of the university community. Therefore, all exams taken must represent your individual unaided efforts. To receive **or offer** information during an examination is cheating. The use of unauthorized supplementary material during exams is also cheating. Conduct or actions that disrupt class or test periods or falsification of information related to chemistry courses by any student will be taken as violation of the policies of the Board of Regents of the University System of Georgia and the GSU Student Code of Conduct Section 6.0. Any suspected offenses may be referred to the Department Chair or the Dean of Students for appropriate disciplinary action. Any student presenting falsification documentation will receive an “F” for the course and referred to the Chemistry Chair or Dean of Students for disciplinary action.

NO CELL PHONES!!!

Hats need to be removed

Before any exam is passed nothing should be on your desk except pencils, your ID or a calculator

When time is called for an exam to end, any student still writing will receive a zero.

Students may not share a calculator during any examination and may not loan their calculator to a friend at any time during or after an exam

Course Outline:

Chemistry 1152 is designed for those students who do not require a detailed organic chemistry background for their majors. Emphasis will be placed on organic compounds of a biological importance. The foundation of Chemistry 1152 is built on the following:

1. Nomenclature
2. Structure (structural isomerism, stereoisomerism and other structural features)
3. Functional groups (reactions, some synthesis and some mechanisms)

Here are some helpful strategies for improving learning and performance in Chemistry 1102/1152

1. Read chapter material **before** class!
2. Study everyday and review weekly.
3. Solve as many chapter problems before using Answers to Selected Problems (pp A13-A40).
4. Study with a friend.
5. Do not fall behind in the assignments

Organic Chemistry consists of concepts which develop from previous concepts. Thus, **DON'T FALL BEHIND.**

Class Time: Lecturing, discussions, homework review and group activities

Group Activities: For each group activity a member of each group will be assigned to lead the group discussions.

Grading Policy

- a) **Exams:** Three exams will be given. The exams will be similar to assigned homework or examples in the text and lectures. If you take all three exams the lowest one will be dropped.

1) Exam Schedule

Exam I, Thursday, Jan.26

Exam II, Tuesday Feb. 14

ACS Final Exam (Organic) Tuesday March 6

Exam III, Wednesday March 20

ACS Final Exam (Biochemistry) Thursday April 26 6:15 – 7:10pm

2) Exam Topics

First Exam: Chapters 1, and 2

Chapter 1 – Introduction to Organic Chemistry: Alkanes

Chapter 2 – Alkenes, Alkynes and Aromatic Compounds

Second Exam: Chapters 3, 4 and 5

Chapter 3 – Some Compounds with Oxygen, Sulfur and Halogen

Chapter 4 – Amines

Chapter 5 – Aldehydes and Ketones

ACS Final Exam (Organic): This exam will be comprehensive and will include Chapters 1-6. You must take this final exam.

Chapters 1 – 5

Chapter 6 – Carboxylic Acids and Their Derivatives

Third Exam: Chapters 7, 8, 9 and 10

Chapter 7 – Carbohydrates

Chapter 8 – Lipids

Chapter 9 – Amino Acids and Proteins

Chapter 10 – Enzymes and Vitamins

ACS Final Exam (Biochemistry): This exam will be comprehensive and will include Chapters 7 – 14. You must take this final exam.

Chapters 7- 10

Chapter 11 - Nucleic Acids and Protein Synthesis

Chapter 12 – Basic Concepts of Metabolism

Chapter 13 – Metabolism of Carbohydrates and Lipids

Chapter 14 – The Generation of Biochemical Energy

c) Quizzes: Twenty 20 to 30 min quizzes are given during lecture (see Reading & Problem Assignment Section)

c) Grades:

Participation	100 pts (12.5%)
Best 2 out of 3 Exams	200 pts (25.0%)
Best 4 out of 5 Quizzes	100 pts (12.5%)
Laboratory	200 pts (25.0%)
Final Exam ACS Examination (Organic Chemistry)	100 pts (12.5%)
Final Exam ACS Examination (Biochemistry)	<u>100 pts.(12.5%)</u>
TOTAL	800 pts (100.0%)

Letter grade is % = (total pts. accumulate x 100) / 800

A (90-100%)	C (70-73%)
A- (87-89%)	C- (66-69%)
B+ (84-86%)	D (60-65%)
B (80-83%)	F (below 60%)
B- (77-79%)	
C+ (74-76%)	

READING AND PROBLEM ASSIGNMENTS

I strongly recommend that you work the following homework problems as you read the text which will gauge your understanding of the course material

- I. Read Chapter 1 Introduction to organic chemistry and alkanes (1/10)
Problems (1) 1.1, 1.4, 1.5c, 1.6a, 1.7b, 1.8, 1.10b, 1.11b, 1.15, 1.16a, 1.17b, 1.33, 1.48, 1.52, 1.54, 1.56
- II. Read Chapter 1 Alkenes and cycloalkanes (1/12)
Problems (1) 1.1, 1.4, 1.5c, 1.6a, 1.7b, 1.8, 1.10b, 1.11b, 1.15, 1.16a, 1.17b, 1.33, 1.48, 1.52, 1.54, 1.56
- III. Read Quiz # 1 (Chapter 1); Chapter 2 Alkenes (1/17)
Problems (2) 2.1c, 2.5, 2.7, 2.8d, 2.9c, 2.10c, 2.13b & c, 2.15, 2.17a, 2.18b, 2.21c, 2.13b & c, 2.15, 2.17a, 2.21c, 2.34c, 2.36a, 2.36c-f, 2.38a-d, 2.48, 2.50, 2.58, 2.62, 2.80a, 2.80c-f, 2.86a, 2.86c-d, 2.90
- IV. Read Chapter 2 Alkenes (1/19)
Problems (2) 2.1c, 2.5, 2.7, 2.8d, 2.9c, 2.10c, 2.13b & c, 2.15, 2.17a, 2.18b, 2.21c, 2.13b & c, 2.15, 2.17a, 2.21c, 2.34c, 2.36b, 2.36c-f, 2.38a-d, 2.48, 2.50, 2.58, 2.62, 2.80a, 2.80c-f, 2.86a, 2.86c-d, 2.90
- V. Read Chapter 2 Alkynes and Aromatic Compounds (1/24)
Problems (2) 2.2b, 2.18b, 2.21c, 2.34b, 2.36b, 2.37, 2.38 e & f, 2.39a-e, 2.40, 2.63, 2.80b, 2.86b & e
- VI. Exam # 1 Chapters 1 – 2 (1/26)
- VII. Read Chapter 3 Alcohols and phenols (1/31)
Problems (3) 3.1, 3.3c-d, 3.4c-d, 3.8c, 3.9b, 3.11c, 3.15b, 3.16, 3.18, 3.30, 3.32, 3.38, 3.40, 3.44, 3.46, 3.50, 3.56, 3.70, 3.71
- VIII. Read Quiz # 2 (Chapters 2 – 3); Chapter 3 Phenols, ethers and thiols (2/1)
Problems (3) 3.1, 3.3c-d, 3.4c-d, 3.8c, 3.9b, 3.11c, 3.15b, 3.16, 3.18, 3.30, 3.32, 3.38, 3.40, 3.44, 3.46, 3.50, 3.56, 3.70, 3.71
- IX. Read Chapter 4 Amines (2/7)
Problems (4) 4.1 - 4.3, 4.5, 4.7b, 4.10a-b, 4.12a-b, 4.14a, 4.18, 4.21, 4.26, 4.28, 4.30, 4.34, 4.40, 4.58, 4.59, 4.64
- X. Read Chapter 5 Aldehydes and ketones (2/9)
Problems (5) 5.1-5.2, 5.3c-d, 5.4c-d, 5.5, 5.8c-d, 5.9a,c, 5.10c, 5.11a, 5.13 – 5.15, 5.17b, 5.26, 5.28, 5.30, 5.32, 5.36a-b, 5.38a, c, 5.40a,c, 5.42, 5.46, 5.58, 5.62, 5.64
- XI. Exam # 2 Chapters 3 – 5 (2/14)
- XII. Read Chapter 5 Aldehydes and ketones (2/16)

Problems (5) 5.1-5.2, 5.3c-d, 5.4c-d, 5.5, 5.8c-d, 5.9a,c, 5.10c, 5.11a, 5.13 – 5.15, 5.17b, 5.26, 5.28, 5.30, 5.32, 5.36a-b, 5.38a, c, 5.40a, c, 5.42, 5.46, 5.58, 5.62, 5.64

XIII. Read Chapter 6 Carboxylic acids and derivatives (2/21)
Problems (6) 6.1 – 6.3, 6.5 – 6.6, 6.7a, 6.9 – 6.10, 6.12, 6.14, 6.17, 6.18b, 6.19, 6.23, 6.24b, 6.25b, 6.28, 6.38, 6.44, 6.46, 6.50, 6.54, 6.58, 6.64, 6.66, 6.70

XIV. Read Chapter 6 Carboxylic acids and derivatives (2/23)
Problems (6) 6.1 – 6.3, 6.5 – 6.6, 6.7a, 6.9 – 6.10, 6.12, 6.14, 6.17, 6.18b, 6.19, 6.23, 6.24b, 6.25b, 6.28, 6.38, 6.44, 6.46, 6.50, 6.54, 6.58, 6.64, 6.66, 6.70

Friday, 2/24 MIDPOINT: This is the last day to withdraw from classes & receive a “W” grade

XV. Spring Break Feb. 27 – March 4

XVI. ACS FINAL EXAM (ORGANIC – Chapters 1 -6) (3/6)

XVII. Read Chapter 7 Carbohydrates (3/8)
Problems (7) 7.1 – 7.4, 7.6a, 7.7, 7.10 -7.11, 7.13 – 7.14, 7.16, 7.20, 7.32, 7.34, 7.38, 7.42

XVIII. Read Chapter 7 Carbohydrates; Chapter 8 Lipids (3/13)
Problems (7) 7.44, 7.46, 7.50, 7.52, 7.54, 7.60, 7.64, 7.66, 7.68, 7.72, 7.76, 7.84
Problems (8) 8.1 -8.3, 8.6, 8.8, 8.10a, 8.12, 8.16, 8.24, 8.28, 8.36, 8.46, 8.48, 8.52, 8.92

XIX. Read Quiz #3 (Chapters 7 - 8); Chapter 8 Lipids; Chapter 9 Amino acids and proteins (3/15)
Problems (9) 9.1 – 9.5, 9.7 – 9.9, 9.12 – 9.13, 9.15 – 9.17, 9.20 – 9.21, 9.26, 9.32, 9.34, 9.38, 9.42, 9.46, 9.50, 9.52, 9.60, 9.66, 9.68, 9.70, 9.98

XX. Read Chapter 10 Enzymes and Vitamins (3/20)
Problems (10) 10.1, 10.5 – 10.6, 10.9, 10.12 -10.15, 10.17, 10.30, 10.34, 10.38, 10.40, 10.44, 10.72

XXI. Exam # 3 Chapters 7 – 10 (3/22)

XXII. Read Chapter 11 DNA, RNA (3/27)
Problems (11) 11.2, 11.4 – 11.5, 11.7 – 11.8, 11.10, 11.12 – 11.13, 11.15, 11.17 – 11.18, 11.26, 11.32, 11.36, 11.38, 11.42, 11.46, 11.52, 11.60

XXIII. Read Chapter 11 DNA, RNA (3/29)
Problems (11) 11.2, 11.4 – 11.5, 11.7 – 11.8, 11.10, 11.12 – 11.13, 11.15, 11.17 – 11.18, 11.26, 11.32, 11.36, 11.38, 11.42, 11.46, 11.52, 11.60

XXIV. Read Chapter 12 Introduction to metabolism; Chapter 13 Glycolysis (4/3)
Problems (12) 12.1, 12.4, 12.7 – 12.8, 12.10, 12.42, 12.46, 12.48, 12.54
Problems (13) 13.1, 13.3 – 13.5, 13.7 – 13.9, 13.38, 13.42, 13.44, 13.48, 13.52, 13.58

XXV. Read Quiz #4 (Chapters 11 - 13); Chapter 13 Gluconeogenesis, Glycogenolysis (4/5)
Problems (13) 13.6, 13.60, 13.64

XXVI Read Chapter 13 Lipolysis (beta oxidation), lipid metabolism (4/10)
Problems (13) 13.12, 13.14a, 13.15, 13.82, 13.86, 13.94, 13.104, 13.112, 13.116

XXVII Read Chapter 14 Metabolism of carbohydrates and lipids (citric acid cycle (Krebs cycle)),
(Electron transport chain (ETC)) (4/12)
Problems (14) 14.1 – 14.5

XXVIII Read Quiz #5 (Chapter 13 – 14); Chapter 14 Metabolism, ATP synthesis” oxidative
phosphorylation” (4/17)
Problems (14) 14.19 – 14.28

XXIX Help session review of biochemistry (students are strongly recommended to come but
attendance will not be enforced (4/19)

XXX. ACS FINAL EXAM (BIOCHEMISTRY - Chapters 7 -14) (4/26 6:15 – 7:10pm)

How to solve chemistry problems - G. Bodner

1. Read the problem
2. Now read the problem again.
3. Write down what you hope is relevant information.
4. Draw a picture, make a list, or write an equation or formula to help you begin to understand the problem.
5. Try something.
6. Try something else.
7. See where it gets you.
8. Read the problem again.
9. Try something else.
10. See where this gets you.
11. Test intermediate results to see whether you are making any progress toward an answer.
12. Read the problem again.
13. When appropriate strike your forehead and say "Son of a..."
14. Write down *an* answer (not necessary *the* answer).
15. Test the answer to see if it makes sense.
16. Start over if you have to, celebrate if you don't.

PRACTICE PROBLEMS

Write all the stereochemical configurations (Fischer projections) for the following compounds. Assign R or configurations to each stereogenic center in these structures. **WATCH OUT FOR DUPLICATE PROJECTIONS.**

