

Organic Chemistry I
Chemistry 3401A, Fall 2019

Dr. Christine Whitlock
cwhitlock@georgiasouthern.edu

Lecture: TR 8:00-9:15AM

Lab: M 11:15AM-2:05PM

Phone: 478-5682

Office: S/N 3214

Office Hours: TR 9:30-10:00AM

Supplemental Instruction: TBD

Course Description: Students will be introduced to the theories and principles of organic chemistry. Topics include the structure, properties, reactions and stereochemistry of organic molecules. Reaction mechanisms will be introduced.

Learning Outcomes:

1. Students will be able to explain bonding in organic compounds, relate hybridization to molecular shape and be able to represent organic molecules in the common formats employed in organic chemistry.
2. Students will be able to identify and complete acid/base reactions and rank molecules in terms of acid or base strength.
3. Students will be able to identify and distinguish enantiomers, diastereomers and meso compounds and employ key stereochemical concepts.
4. Students will be able to synthesize, name, predict properties for and use the reactions of alkanes, alkenes, alkynes and alkyl halides. Students will also be able to evaluate and diagram mechanisms for these reactions employing curved arrow notation.
5. Students will employ standard organic laboratory techniques to carry out experiments that reinforce the lecture portion of the course.

Pre-requisites: CHEM 1211 & 1212, grade of C or better

Textbooks: Online, in Folio

Supplies: Standard calculator, Molecular model kit (optional)

Grading Policy: Points will be earned from quizzes, homework, exams and the lab. The final grade will be calculated as a ratio of total points earned to total points possible and is based on the ten-point scale.

Quizzes	130 pts
WileyPLUS Homework (10)	120 pts
Exams (4)	400 pts
Final Exam	150 pts
Labs (11)	<u>200 pts</u>
	1000 pts possible

No make-up assignments, exams or labs will be given without a VALID, written excuse, i.e. athletic travel, serious illness, family emergency. Work must be done independently and handed in on time. The final exam will be comprehensive.

WileyPLUS Homework: Course ID: 719064. An access code to WileyPLUS Learning is required. Homework (12) assignments are to be completed at wileyplus.com.

Academic Dishonesty: All provisions of the *Student Conduct Code* apply and will be enforced. Cheating on any assignment or exam will result in a 0 for any student(s) involved.

Attendance Policy: Attendance is not required, but it should be noted that regular attendance is very important to success in a chemistry class. Excessive tardiness disturbs the class and will not be tolerated.

Academic Emergency Plan: In the event of a school closure, instructions for making up class time and/or assignments will be posted on Folio.

Ownership Statement: No distribution beyond personal use is allowed without permission.

GRADE WORKSHEET

	<u>Pts. Earned</u>	<u>Pts. Possible</u>
Classwork	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
Exams	_____	100
	_____	100
	_____	100
	_____	100
Lab	_____	200
Final Exam	_____	150
Bonus	_____	_____

CLASS OUTLINE

August	20	Introduction and Chapter 1: A Review of General Chemistry
	22	
	27	Chapter 2: Molecular Representations
September	29	Chapter 3: Acids and Bases
	3	Chapter 4: Alkanes and Cycloalkanes
	5	
	10	
	12	*Exam 1*
	17	Chapter 4 (cont.)
	19	Chapter 5: Stereoisomerism
	24	
	26	
October	1	Chapter 6: Chemical Reactivity and Mechanisms
	3	
	8	*Exam 2*
	10	Chapter 7: Alkyl Halides: Nucleophilic Substitution and Elimination Reactions
	15	
	17	
	22	Chapter 8: Addition Reactions of Alkenes
	24	
	29	
	31	*Exam 3*
November	5	Chapter 9: Alkynes
	7	
	12	Chapter 10: Radical Reactions
	14	Chapter 11: Synthesis
	19	
	21	*Exam 4*
December	3	Review
	5	Review
	12	**Final Exam** 7:30-9:30AM

Organic Chemistry II
Chemistry 3402A, Spring 2020

Dr. Christine Whitlock
cwhitlock@georgiasouthern.edu

Lecture: TR 8:00-9:15AM

Lab: M 8:00AM-10:50AM

Phone: 478-5682

Office: S/N 3214

Office Hours: TR 9:30-10:00AM

Supplemental Instruction: TBD

Course Description: Students will be introduced to the theories and principles of organic spectroscopy and synthesis. Topics include mass spectrometry; IR, UV/Vis, and NMR spectroscopy; and the conditions and mechanisms of aliphatic, aromatic and carbonyl reactions, as well as the use of these reactions in multistep syntheses.

Learning Outcomes:

1. Students will be able to synthesize, name, predict properties for and use the reactions of conjugated dienes, aromatic compounds, alcohols, ethers, aldehydes, ketones, carboxylic acids, carboxylic acid derivatives and amines. Students will also be able to evaluate and diagram mechanisms for these reactions employing curved arrow notation.
2. Students will be able to determine the products and/or reactants for carbonyl condensations and alpha-substitution reactions of carbonyl compounds.
3. Students will be able to use spectroscopic techniques to identify and characterize organic compounds.
4. Students will employ standard organic laboratory techniques to carry out experiments that reinforce the lecture portion of the course.

Pre-requisites: CHEM 3401, grade of C or better

Textbook: Online (Folio); Organic Chemistry, 3rd ed. Klein (optional hard copy)

Supplies: Standard calculator, Darling molecular model kit (optional)

Grading Policy: Points will be earned from quizzes, exams and the lab. The final grade will be calculated as a ratio of total points earned to total points possible and is based on the ten-point scale.

Quizzes/Classwork	100 pts
WileyPlus Homework (10)	75 pts
Exams (4)	400 pts
Final Exam	150 pts
Labs (11)	<u>175 pts</u>
	900 pts possible

No make-up assignments, exams or labs will be given without a VALID, written excuse, i.e. athletic travel, serious illness, family emergency. Work must be done independently and handed in on time. The final exam will be comprehensive.

WileyPLUS Homework: Course ID: 742661. An access code to WileyPLUS Learning is required. Homework (10) assignments are to be completed at wileyplus.com.

Academic Dishonesty: All provisions of the *Student Conduct Code* apply and will be enforced. Cheating on any assignment or exam will result in a 0 for any student(s) involved.

Attendance Policy: Attendance is not required, but it should be noted that regular attendance is very important to success in a chemistry class. Excessive tardiness disturbs the class and will not be tolerated.

Academic Emergency Plan: In the event of a school closure, instructions for making up class time and/or assignments will be posted on Folio.

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GRADE WORKSHEET

Classwork

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

WileyPlus Homework

_____	75
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Exams

_____	100
_____	100
_____	100
_____	100

Lab

Reactions of Alcohols

_____	5	_____	10
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IR Spectroscopy

_____	5	_____	10
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NMR Spectroscopy

_____	5	_____	10
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ID of Unknown Compound

_____	5	_____	10
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Compound W

_____	5	_____	10
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Prep of Azo Dyes

_____	5	_____	10
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Iodination of Salicylamide

_____	5	_____	10
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Hydrolysis Rates of Esters

_____	5	_____	10
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Diels-Alder

_____	5	_____	10
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The Aldol Reaction

_____	5	_____	10
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Combinatorial Synthesis

_____	5	_____	10
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Notebook

_____	10
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Final Exam

_____	150
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CLASS OUTLINE

January	14	Introduction/Chapter 12: Alcohols and Phenols
	16	
	21	Chapter 13: Ethers and Epoxides; Thiols and Sulfides
	23	
	28	*Exam 1*
	30	Chapter 14: Infrared Spectroscopy and Mass Spectrometry
February	4	
	6	Chapter 15: Nuclear Magnetic Resonance Spectroscopy
	11	
	13	
	18	
	20	*Exam 2*
	25	Chapter 16: Conjugated Pi Systems and Pericyclic Reactions
	27	Chapter 17: Aromatic Compounds
March	3	
	5	
	10	Chapter 18: Aromatic Substitution Reactions
	12	
	17	<i>Spring</i>
	19	<i>Break</i>
	24	
	26	
	31	*Exam 3*
April	2	Chapter 19: Aldehydes and Ketones
	7	
	9	Chapter 20: Carboxylic Acids and Their Derivatives
	14	
	16	Chapter 21: Alpha Carbon Chemistry: Enols and Enolates
	21	
	23	
	28	*Exam 4*
	30	Review
May	7	**Final Exam** 7:30AM-9:30AM

Organic Chemistry II Laboratory
Chemistry 3402AA & AB, Spring 2020

Dr. Christine Whitlock
Monday, 8:00AM-10:50AM

Office: S/N 3214
Phone: 478-5682

Objective: Students will learn organic laboratory techniques and safety principles

Textbooks: CHEM 3402 Organic Chemistry Laboratory Manual

Supplies: Safety glasses or goggles, standard calculator, composition notebook

Grading Policy: Points will be earned from pre-labs, data sheets and/or laboratory reports. Data report sheets are due at the end of the lab, and the lab reports are due at the beginning of the next lab period. Points may be deducted from a student's lab grade for horseplay, dishonesty or failure to follow rules of safety and cleanliness. With a valid, written excuse, a missed lab may be completed at a time scheduled by the student and instructor. Honest discussion in the laboratory is encouraged, but sharing data is forbidden.

Lab Notebook: Raw data from each experiment should be kept in a composition notebook. The notebook may be graded at the end of the semester for content and quality of notes. Nothing should be written in the notebook outside of lab.

Lab Report: The lab report should be either typewritten or handwritten in blue or black ink. The format will be provided during the semester.

Schedule:

DATE	EXPERIMENT	PTS
January 27	Check-in and Safety /Reactions of Alcohols	5/10
February 3	Infrared Spectroscopy	5/10
February 10	NMR Spectroscopy	5/10
February 17	NMR & IR Spectroscopy	5/10
February 24	The Compound W Project	5/10
March 2	Preparation of Para Red and Related Azo Dyes	5/10
March 10	Iodination of Salicylamide	5
March 16	<i>Spring Break</i>	
March 23	Iodination of Salicylamide (cont.)	10
March 30	Hydrolysis Rates of Esters	5/10
April 6	Diels-Alder	5/10
April 13	Aldol Condensation	5
April 20	Aldol Condensation (cont.)	10
April 27	Combinatorial Synthesis/Check-out and Lab Clean-up	5/10