

# Brazosport College

## Syllabus for CHEM 2323 - Organic Chemistry I

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### I. COURSE DESCRIPTION

#### **CHEM 2323 - Organic Chemistry I. CIP 4005045203**

A study of the nomenclature, classification, and reactions of aliphatic compounds by means of reaction mechanisms, transition state theory, stereochemistry, Alkanes, alkyl halides, alcohols, alkenes, alkynes, alicyclics and aromaticity are studied. **Credit Hours:** 3 (3 lecture, 0 lab)

- A. Prerequisite:** Grade of “C” or better in CHEM 1312.  
**Required skill level:** College-level reading, writing and math.

## II. COURSE OBJECTIVES

The course is designed to help the student:

1. To become familiar with the nomenclature of the various major families of hydrocarbons: alkanes, alkyl halides, alcohols, alkenes, alkynes, and alicyclics.
2. To understand how chemical bonding and molecular structure in hydrocarbons are related to physical properties and chemical behavior.
3. To gain a basic understanding of stereoisomers, their relationship to optical activity, and their application to the elucidation of reaction mechanisms.
4. To learn the various reaction mechanisms which are characteristic of each of the functional groups in the hydrocarbon families, as well as the structures and conditions which favor one mechanism over another.
5. To understand the application of reaction kinetics and transition state theory to the prediction of the most likely products for a given set of reagents.
6. To understand the special stability of benzene and its derivatives in terms of electron delocalization and basic molecular orbital theory.
7. To gain a background in chemical principles sufficient for success in more advanced courses such as Chemistry 2425.
8. To acquire basic laboratory skills and carry out quantitative procedures in a laboratory setting as specified in section III.

## III. STUDENT LEARNING OUTCOMES

OUTCOME	METHOD OF ASSESSMENT
Write the common or systematic name of the common classes of organic compounds from a structural drawing or given the common name or systematic name of the common classes of organic compounds, draw the structure of the compound.	Student's success on the following questions on the final exam which relate to naming or drawing the structure of the common classes of organic compounds will be evaluated: 3, 4 and 5.
Choose the lowest (or highest) energy conformation of an acyclic or cyclohexane derivative from several choices.	Student's success on the following questions on the final exam which relate to choosing the lowest (or highest) energy conformation of an acyclic or cyclohexane derivative will be evaluated: 7 and 8.
Draw the correct structure for the reaction product(s) for the addition of electrophilic reagents to an alkene or given the alkene and the reaction product, state the reagents required for the transformation.	Student's success on the following questions on the final exam which relate to drawing the correct structure for the reaction product(s) for the addition of electrophilic reagents to an alkene or given the alkene and the reaction product, stating the reagents required for the transformation will be evaluated: 11, 12, and 13.

OUTCOME	METHOD OF ASSESSMENT
Given the structure of a chiral compound, correctly state its absolute configuration or given the name of a chiral compound including its absolute configuration, draw its structure.	Student's success on the following questions on the final exam which relate to give the structure of a chiral compound, correctly stating its absolute configuration or given the name of a chiral compound including its absolute configuration, drawing its structure will be evaluated: 15 and 16.
For compounds containing delocalized electrons, draw the Lewis structure of resonance contributors (including formal charges) and predict their relative stabilities.	Student's success on the following questions on the final exam which relate to compounds containing delocalized electrons, drawing the Lewis structure of resonance contributors (including formal charges) and predicting their relative stabilities will be evaluated: 19 and 20.
Given a representation of a set of molecular orbitals for an organic compound with delocalized electrons, rank them according to their potential energy and correctly choose the HOMO (highest occupied molecular orbital) and the LUMO (lowest occupied molecular orbital).	Student's success on the following questions on the final exam which relate to Given a representation of a set of molecular orbitals for an organic compound with delocalized electrons, ranking them according to their potential energy and correctly choosing the HOMO (highest occupied molecular orbital) and the LUMO (lowest occupied molecular orbital) will be evaluated: 21 and 22.
Draw the structures for the electrophilic addition products to conjugated dienes and correctly denote the thermodynamic or kinetic product.	Student's success on the following questions on the final exam which relate to drawing the structures for the electrophilic addition products to conjugated dienes and correctly denoting the thermodynamic or kinetic product will be evaluated: 24 and 25
Student's success on the following questions on the final exam which relate to drawing the structures for the electrophilic addition products to conjugated dienes and correctly denoting the thermodynamic or kinetic product will be evaluated: 24 and 25	Depict the steps in the free radical halogenation of an alkane and predict the product distribution.

#### IV. TEXTBOOK OR COURSE MATERIAL INFORMATION

##### A. Textbook

1. Organic Chemistry, Bruice 8<sup>th</sup> Edition, Pearson Publisher, 2017.  
ISBN: 978-0-321-404228-2 (required)
2. Study Guide/Solutions Manual, Bruice 8<sup>th</sup> Edition, Pearson Publisher, 2017  
ISBN: 978-0-13-4066585-5 (recommend)
3. Scientific Calculator T 130XA (required)

Required course materials are available at the Brazosport College bookstore, on campus or online at <http://brazosport.edu/bookstore/home.html>. Students are not under any obligation to purchase a textbook from the college bookstore. The same textbook is/may also be available from an independent retailer, including an online retailer.

**For Distance Education Courses include the following:** Contact the Brazosport College Bookstore with a credit card for course materials. Phone: 979.230.3651. Fax: 979.230.3653. Email: [bookstore@brazosport.edu](mailto:bookstore@brazosport.edu). Website: <http://brazosport.edu/bookstore/home.html>.

## B. Course Outline

**This is a sample outline which may vary with individual instructors. It will also vary based on whether the course is a summer course or a fall/spring course. Students should contact their instructor for the outline of the course they are taking.**

Week	Topic	
1	Review of Bonding	1.1 - 1.1.13
	Hybridization and Acids/Bases	1.14 - 1.21
2	Nomenclature of Organic Compounds	2.1 2.7
3	Physical Properties of Organic Compounds, Conformation of Alkanes	2.8 - 2.10
	Conformation of Cycloalkanes	2.11 - 2.15
4	<b>Exam 1</b>	
	Alkenes - structure, nomenclature & reactivity	3.1 -3.7
5	Reaction of Alkenes	4.1 - 4.6
	Reaction of Alkenes (continued)	4.7 -4.12
6	<b>Exam 2</b>	
	Stereochemistry	5.1 -5.8
7	Stereochemistry (continued)	5.9 - 5.14 5.18 - 5.19
	Reaction of Alkynes	6.1 - 6.8
8	Alkynes (continued)	6.9 - 6.12
9	Electron Delocalization and Resonance	7.1 - 7.8
	Consequences of Electron Delocalization Dienes	7.9 -7.10
10	Reaction of Dienes	7
	Reactions of Alkanes	12
11	Reactions of Alkanes (continued) and review	12
	<b>Exam 3</b>	
12	Substitution Reactions of Alkyl Halides	8
	Stereochemistry of S <sub>N</sub> 1 & S <sub>N</sub> 2 reactions	8
13	Elimination Reactions	9
14	Elimination vs. Substitution	9
	Reactions of Alcohols <b>Exam 4</b>	10

**Important Semester Dates:**

Last Day to Withdraw from Classes– Check BC Academic Calendar -  
<http://catalog.brazosport.edu/index.php>

**Office Hours:**

For fulltime faculty, office hours may change from semester to semester. Current faculty office hours are included on the syllabus, see link: <https://brazosport.edu/faculty-and-staff/resources/course-syllabi-instructor-information/>

For an adjunct faculty, no office hours are required, and they are not assigned an office. To set up an appointment with an adjunct, contact the instructor as per the email address on the syllabus, see link: <https://brazosport.edu/faculty-and-staff/resources/course-syllabi-instructor-information/>

**V. STUDENTS WITH DISABILITIES**

Brazosport College is committed to providing equal education opportunities to every student. BC offers services for individuals with special needs and capabilities including counseling, tutoring, equipment, and software to assist students with special needs. For student to receive any accommodation, documentation must be completed in the Office of Disability Services. Please contact Phil Robertson, Special Populations Counselor at 979-230-3236 for further information.

**VI. TITLE IX STATEMENT**

Brazosport College faculty and staff are committed to supporting students and upholding the College District's non-discrimination policy. Under Title IX and Brazosport College's policy FFDA (Local), discrimination based on sex, gender, sexual orientation, gender identity, and gender expression is prohibited. If you experience an incident of discrimination, we encourage you to report it. While you may talk to a faculty or staff member at BC, please understand that they are "Responsible Employees" and must report what you tell them to college officials. You can also contact the Title IX Coordinators directly by using the contact information below. Additional information is found on the Sexual Misconduct webpage at [www.brazosport.edu/sexualmisconduct](http://www.brazosport.edu/sexualmisconduct).

Alex Crouse, Director of Student Life and Title IX Coordinator  
979-230-3355; [alex.crouse@brazosport.edu](mailto:alex.crouse@brazosport.edu)

Mareille Rolon, HR Coordinator and Deputy Title IX Coordinator  
979-230-3303; [mareille.rolon@brazosport.edu](mailto:mareille.rolon@brazosport.edu)

**VII. ACADEMIC HONESTY**

Brazosport College assumes that students eligible to perform on the college level are familiar with the ordinary rules governing proper conduct including academic honesty. The principle of academic honesty is that all work presented by you is yours alone. Academic dishonesty including, but not limited to, cheating, plagiarism, and collusion shall be treated appropriately. Please refer to the Brazosport College Student Guide for more information.

Academic dishonesty violates both the policies of this course and the Student Code of Conduct. In this class, any occurrence of academic dishonesty will be referred to the Dean of Student Services for prompt adjudication, and may, at a minimum, result in F, in this course. Sanctions may be imposed beyond your grade in this course by the Dean of Student Services.

It is your responsibility to know and understand the student code of conduct with regard to scholastic honesty, as well as the consequences for a breach of conduct. If you cheat on an exam, you will receive an "F" for the class. Please refer to the Brazosport College Student Guide for more information. This is available online at <http://brazosport.edu/students/for-students/student-services/>

### **VIII. ATTENDANCE AND WITHDRAWAL POLICIES**

Class attendance contributes to your final grade, but you must attend class to successfully complete the course. If you are unable to complete this course, you must complete and submit a withdrawal form with the registrar's office. If the student decides to drop out of the class, it is the responsibility of the student to initiate a withdrawal before the withdrawal deadline in order to get a "W" on their transcript.

If this is not done the student will receive a grade based on test grades and class grades earned during their attendance and absence (i.e., zeros on all missed materials, exams, skills tests, and final exam). If you stop participating on-line and do not withdraw, you will receive a performance grade, usually an "F".

### **IX. COURSE REQUIREMENTS AND GRADING POLICY**

#### **A. Grading**

Four exams 80%

Final exam 20%

Grades are assigned as follows:

Grade	Final Average
A	90-100
B	80-89
C	70-79
D	60-69
F	Below 60

#### **B. Make-Up Policy**

##### **There Will Be No Make-Up Exams.**

However, if the student anticipates a legitimate absence (as judged by the instructor) for an exam, arrangements can be made to take the exam. This must be done before the next scheduled class after the exam. A missed exam will be counted as a zero toward the final grade.

### **X. STUDENT CONDUCT STATEMENT**

Students are expected to be aware of and follow the Brazosport College Student Code of Conduct. Students have violated the Code if they "fail to comply with any lawful directions, verbal or written, of any official at BC." Lawful directions include precautions and requirements taken to prevent the spread of COVID-19 at Brazosport College. Students who do not follow safety requirements, including the wearing of a mask, may be removed from class by their instructor and referred to the Dean of Student Services.

## **XI. CAMPUS CLOSURE STATEMENT**

Brazosport College is committed to the health and safety of all students, staff, and faculty and adheres to all federal and state guidelines. The College intends to stay open for the duration of the semester and provide access to classes and support services on campus in the safest way possible. The College will also comply with lawful orders given by applicable authorities, including the Governor of Texas, up to and including campus closure. It is possible that on campus activities may be moved online and/or postpone if such orders are given.

## **XII. STUDENT RESPONSIBILITIES**

Students are expected to fully participate in this course. The following criteria are intended to assist you in being successful in this course:

1. Understand the syllabus requirements
2. Use appropriate time management skills
3. Communicate with the instructor
4. Complete course work on time, and
5. Utilize online components (such as Desire2Learn) as required.

## **XIII. OTHER STUDENT SERVICES INFORMATION**

Information about the Library is available at <http://brazosport.edu/students/for-students/places-services/library/about-the-library/> or by calling 979-230-3310.

For assistance with online courses, an open computer lab, online and make-up testing, audio/visual services, and study skills, visit Learning Services next to the Library, call 979-230-3253 or visit <http://brazosport.edu/students/for-students/places-services/learning-services/>

For drop-in math tutoring, the writing center, supplemental instruction and other tutoring including e-tutoring, visit the Student Success Center, call 979-230-3527, or visit <http://brazosport.edu/students/for-students/student-success-center/>

To contact the Physical Sciences and Process Technologies Department call 979-230-3618.

The Student Services provides assistance in the following:

Counseling and Advising	979-230-3040
Financial Aid	979-230-3294
Student Life	979-230-3355

To reach the Information Technology Department for computer, email, or other technical assistance call the Helpdesk at 979.230.3266.



Get the information you need – when you need it. Click <http://geni.us/BRAZO> to install **BC Connect** on your mobile device to receive reminders, explore careers, map your educational plan, be in the know about events, find out about scholarships, achieve your goals and much more.