

University College Roosevelt

**Chemistry I – SCICHEM101**  
**Organic Chemistry**  
(Bruice, 8<sup>th</sup> Edition)

**Classes: Thursday 18:15 – 20:15; Friday 11:00 – 13:00 (classroom T-1)**



**Instructor:**

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## I. Course description

Chemistry is a massive scientific field (expressed among other things in the world's largest index known as the Chemical Abstracts Service) not easily condensed in one or even three courses at any university. However, in order to convey a *general* perspective on the *molecular and atomic* world, the first course in chemistry at the University College Roosevelt (UCR) will attempt to do just that. Emphasis thus is on the *molecular aspects of chemistry*. In the first course, we will use part of the book *Organic Chemistry* by Bruice, 8<sup>th</sup> edition. A number of subjects will be dealt with:

- Structure and state of matter and its measurements
- Chemical bonds
- Chemical reactivity
- Acids and bases
- (Bio)organic chemistry: alkanes, alkenes, alkynes, and etceteras
- Types of reactions
- Stereochemistry

Although we will follow the book in general, some extra material (such as name reactions and mechanisms) will be discussed in the lectures. These extra lecture features, and all other lectures, will be put on Moodle.

## II. Study load

The class meets twice a week for two hours per class on Thursday (18:15 – 20:15) and on Friday (11:00 – 13:00). The amount of study hours per week is (roughly) estimated to be 6 – 8 hours.

## III. Course materials

As stated, for the course the following book will be used:

*Organic Chemistry 8<sup>th</sup> Edition*  
 Paula Yurkanis Bruice  
 Prentice Hall, Pearson.

## IV. Course organization, requirements, assessment

The course will be assessed with a *Mid-term Exam* contributing 25% of the grading, and a *Final Exam* contributing 30%. During the course the students are expected to *participate actively* in classes. Active Participation (20%) will be assessed as follows: (i) preparation of classes by studying the texts; (ii) asking questions (prepared in advance or during class) and giving answers to question posed in class by the teacher or students; (iii) making critical remarks during class; (iv) carrying out given assignments *on time*; (v) overall involvement during class. Assignments are done in class or given as homework and are rated 25% (in total) of the overall grade.

In summary, the grading of the course will be as follows:

Mid-term Exam	:	25 %
Final Exam	:	30 %
Assignments (homework)	:	25 %
Active Participation	:	20 %

Participation is graded as follows. **A (77 – 100%)**: Always (or nearly always) engaged in class. A person who receives an A as a participation grade turns in assignments on time and shows initiative. People in this category voluntarily contribute to class discussions and those contributions are positive/critical and valuable.

**B (67 – 76%):** Engaged in class. A person who receives a B as a participation grade turns in assignments on time and although not as active as people who receive an A, they are still a positive/critical element in the class.

**C (56 – 66%):** Generally engaged. A person who receives a C as a participation grade normally turns in assignments on time, though they might cite technical problems. A person who receives this grade might be the kind of person who turns in assignments on time and is present in class, but their active involvement is sometimes limited.

**D – F (< 55%):** Generally not engaged or present in class. **If you miss more than 6 class sessions you will have failed the course!**

## V. Course schedule (tentative)

Below, I have summated the chapters we will be working through during the course. Overall, the timeframe of the semester is as follows (and is not tentative):

Autumn semester: August 26, 2019 - December 16, 2019

Autumn break: October 14 – 18 2019

In detail:

Week & date	Theme/lecture	Literature
1. 29 and 30 August	Remembering General Chemistry: Electronic Structure and Bonding	Chapter 1
2. 5 and 6 September	Acids and Bases: Central to Understanding Organic Chemistry/ <b>review</b>	Chapter 2
3. 12 and 13 September	An Introduction to Organic Compounds: Nomenclature, Physical Properties, and Structure	Chapter 3
4. 19 and 20 September	Isomers: The Arrangement of Atoms in Space	Chapter 4
5. 26 and 27 September	Alkenes: Structure, Nomenclature, and an Introduction to Reactivity • Thermodynamics and Kinetics/ <b>review</b>	Chapter 5
6. 3 and 4 October	<b>Test exam/question time</b>	<b>Chapter 1, 2, 3, 4, 5</b>
7. 10 and 11 October	<b>Exam: 11 October</b>	<b>Chapter 1, 2, 3, 4, 5</b>
8. 17 and 18 October	<b>Fall break</b>	-
9. 24 and 25 October	The Reactions of Alkenes • The Stereochemistry of Addition Reactions	Chapter 6
10. 31 October and 1 November	The Reactions of Alkynes • An Introduction to Multistep Synthesis/ <b>review</b>	Chapter 7
11. 7 and 8 November	Substitution/elimination reactions of alkyl halides / <b>review</b>	Chapter 9
12. 14 and 15 November	Reactions of Alcohols, Ethers, Epoxides, Amines, and Sulfur-Containing Compounds	Chapter 10
13. 21 and 22 November	Reactions of Carboxylic Acids and Carboxylic Acid Derivatives	Chapter 15
14. 28 and 29 November	Reactions of Aldehydes and Ketones • More Reactions of Carboxylic	Chapter 16
15. 5 and 6 December	<b>Test exam/question time</b>	<b>Chapter 6, 7, 9, 10, 15, 16</b>
16. 12 and 13 December	<b>Exam: 13<sup>th</sup> of December</b>	<b>Chapter 6, 7, 9, 10, 15, 16</b>

The term 'review' stands for homework/class assignments/question time and the like so that the discussed material can be internalised effectively.

## VI. Course learning objectives – chemical track

The course aims to provide an understanding of the main chemical processes in the field of (bio-organic) chemistry with a specific focus on the molecular aspects thereof. After this course, students will be able to grasp the fundamentals of the field of molecular chemistry and have an elementary understanding of scientific articles and textbooks.

Overall the twelve RA 'Measurable Program Outcomes' that are used to describe tracks are as follows:

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### Measurable program outcomes

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1. Acquire knowledge/perspectives in relevant domains
  2. Grasp relevant objectives, assumptions and values
  3. Understand state-of-the-art knowledge
  4. Critically review results, arguments, problem formulations
  5. Adopt and exercise relevant academic attitudes.
  6. Understand/apply domain knowledge in other contexts
  7. Grasp interdisciplinary issues within specialisation
  8. Develop and apply new knowledge, methods, skills and expertise.
  9. Communicate at scholarly level
  10. Reflect on personal/academic growth and development
  11. Master with autonomy a range of specialist topics in preparation for further academic or professional training
  12. Function effectively in team-based projects or exercises (or individual 'command' decision exercises).
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Within the context of the *entire* UCR chemical track, students who are planning for graduation in the field of chemistry are *strongly* encouraged to follow undergraduate courses focussing on experimental skills and additional chemical subjects at *other* universities, preferably combined with UCR's physical chemistry course.