

# **CHEM-UA9226L01 & L02, Organic Chemistry II**

NYU London: Spring 2019

## **Instructor Information**

- Dr Aga Kosinska

## **Course Information**

- **Lectures: Tuesdays & Thursdays;**
  - CHEM-UA-9226L01; 1.00 – 2.15 pm
  - CHEM-UA-9226L02; 4.30 – 5.45 pm
    - Room 303, Bedford Square
- **Recitation sessions:**
  - Mondays; 3.00 – 3.55 pm in G03
  - Tuesdays; 11.00 – 11.55 in 305
  - Wednesday; 10.45 – 11.40
  - Thursdays; 6.00 – 6.55 in 303
- **Co-requisite:** Organic Chemistry Laboratories II
- **Prerequisite:** Organic Chemistry I

## **Course Overview and Goals**

The major aim of this course is to explore organic chemistry and to employ a prior knowledge in more advanced topics such as chemical and physical properties of dienes, aromatics, carbonyl compounds, carboxylic acids and their derivatives, and carbohydrates.

### **Upon Completion of this Course, students will be able to:**

- understand bonding and structure of dienes, aromatic and carbonyl compounds, carboxylic acids and their derivatives, and carbohydrates
- understand reactivity of different chemical systems in terms of their propensity towards electrophiles and nucleophiles
- understand structures of carbohydrates as well as their reactivity
- understand reactions controlled by orbital symmetry

## **Course Requirements**

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## Grading of Assignments

The grade for this course will be determined according to these assessment components:

<b>Assignments/ Activities</b>	<b>Description of Assignment</b>	<b>% of Final Grade</b>	<b>Due</b>
Laboratories	Lab reports and final practical examination	25	
Lectures:		75	
Quizzes	Quizzes will be conducted in recitation section; There will be 9 quizzes. The top 7 scores you receive on those quizzes will count towards the quiz portion	20	
Midterm exams	Two midterm examinations	40	
Final exam	Final examination	40	

Failure to submit or fulfill any required course component results in failure of the class

## Grades

Letter grades for the entire course will be assigned as follows:

<b>Letter Grade</b>	<b>Percent</b>	<b>Description</b>
<b>A</b>	90 - 100	Outstanding participation in the course; excellent comprehension and presentation of the course content;
<b>B</b>	80 – 89	Very good involvement in the course; good working knowledge of the learning outcomes;
<b>C</b>	70 - 79	Good participation in the course; reasonable understanding of the course content;
<b>D</b>	60 - 69	Partial engagement in the course; limited working knowledge of the course material;
<b>F</b>	0 – 59	Inadequate involvement in the course; fractional understanding and knowledge of the learning outcomes;

## Course Materials

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## Required Textbooks & Materials

- Maitland Jones and Steven A. Fleming, “*Organic Chemistry*”, Fifth Edition, ISBN 0393931498
- Maitland Jones, Jr., Henry L. Gingrich, Steven A. Fleming, “*Study Guide/Solutions Manual to Accompany Organic Chemistry*”, Fifth Edition, ISBN 978-0-393-93659- 9

## Optional Textbooks & Materials

- Clayden Jonathan et al., “*Organic Chemistry*”, ISBN 0-19-850346-6
- Michael Hornby and Josephine Peach, “*Foundations of Organic Chemistry*”, ISBN 978-0-19-855680-0
- Patrick Graham, “*A very short introduction: Organic Chemistry*”, ISBN 978-0-19-875977-5

## Resources

- **Access your course materials:** [NYU Classes](http://nyu.edu/its/classes) (nyu.edu/its/classes)
- **Databases, journal articles, and more:** [Bobst Library](http://library.nyu.edu) (library.nyu.edu)
- **NYUL Library Collection:** [Senate House Library](http://catalogue.libraries.london.ac.uk) (catalogue.libraries.london.ac.uk)
- **Assistance with strengthening your writing:** [NYU Writing Center](http://nyu.mywconline.com) (nyu.mywconline.com)
- **Obtain 24/7 technology assistance:** [IT Help Desk](http://nyu.edu/it/servicedesk) (nyu.edu/it/servicedesk)

## Course Schedule

Session/Date	Topic	Reading	Assignment Due
Session 1:	<ul style="list-style-type: none"><li>• Allenes, ketenes and cumulenes;</li><li>• Conjugated dienes</li><li>• Physical &amp; chemical properties of dienes</li><li>• Thermodynamic and kinetic control</li></ul>	Chapter 13.1 – 13.8 (pages 588 – 611)	
Session 2:	<ul style="list-style-type: none"><li>• The allyl system</li><li>• The Diels-Alder reactions</li></ul>	Chapter 13.9 – 13.13 (pages 611 – 634)	
Session 3:	<ul style="list-style-type: none"><li>• The structure of benzene</li><li>• Aromaticity: Hückel’s rule</li></ul>	Chapter 14.1 – 14.6 (pages 641 – 665)	Quiz 1
Session 4:	<ul style="list-style-type: none"><li>• Substituted benzenes</li><li>• Heterocyclic and polycyclic aromatic compounds</li></ul>	Chapter 14.7 – 14.14 (pages 665 – 686)	

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Session/Date	Topic	Reading	Assignment Due
	<ul style="list-style-type: none"><li>Chemistry of benzene and benzyl group</li></ul>		
Session 5:	<ul style="list-style-type: none"><li>Hydrogenation of aromatic compounds</li><li>Electrophilic aromatic substitution reactions</li></ul>	Chapter 15.1 – 15.4 (pages 694 – 719)	Quiz 2
Session 6:	<ul style="list-style-type: none"><li>Electrophilic aromatic substitution (heteroaromatics, disubstituted &amp; polysubstituted benzenes)</li><li>Nucleophilic aromatic substitution</li></ul>	Chapter 15.5 – 15.8 (pages 719 – 741)	
Session 7:	<ul style="list-style-type: none"><li>Special Topics: Benzyne, Diels-Alder reactions, stable carbocations &amp; biological synthesis of aromatic rings</li></ul>	Chapter 15.9 – 15.13 (pages 741 – 756)	Quiz 3
Session 8:	<ul style="list-style-type: none"><li>Introduction to carbonyl compounds</li></ul>	Chapter 16.1 – 16.7 (pages 766 – 784)	
Session 9:		<b>Chapters 14 - 15</b>	<b>Midterm examination</b>
Session 10:	<ul style="list-style-type: none"><li>Additions reactions to carbonyl compounds</li></ul>	Chapter 16.8 – 16.13 (pages 784 – 804)	
Session 11:	<ul style="list-style-type: none"><li>Oxidation reactions</li><li>The Witting reaction</li></ul>	Chapters 16.14 – 16.19 (pages 804 – 820)	Quiz 4
Session 12:	<ul style="list-style-type: none"><li>Carboxylic acids: nomenclature, properties, structures</li></ul>	Chapters 17.1 – 17.3 (pages 834 – 838)	
Session 13:	<ul style="list-style-type: none"><li>IR and NMR data; Acidity &amp; basicity</li></ul>	Chapter 17.4 – 17.5 (pages 838 – 843)	

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Session/Date	Topic	Reading	Assignment Due
Session 14:	<ul style="list-style-type: none"> <li>Carboxylic acids: synthesis &amp; reactions</li> </ul>	Chapters 17.6 – 17.9 (pages 843 – 872)	
Session 15:	<ul style="list-style-type: none"> <li>Derivatives of carboxylic acids: nomenclature, chemical &amp; physical properties of acyl chlorides, spectral analysis</li> </ul>	Chapter 18.1 – 18.5 (pages 879 – 890)	Quiz 5
Session 16:	<ul style="list-style-type: none"> <li>Reactions of acid chlorides, anhydrides &amp; esters</li> </ul>	Chapter 18.6 – 18.8 (pages 890 – 901)	
Session 17:	<ul style="list-style-type: none"> <li>Amides, nitriles and ketenes</li> </ul>	Chapter 18.9 – 18.14 (pages 901 – 923)	Quiz 6
Session 18:	<ul style="list-style-type: none"> <li>Carbonyl chemistry as weak acids</li> <li>Racemization of enols &amp; enolates</li> </ul>	Chapter 19.1 – 19.3 (pages 930 – 944)	
Session 19:		<b>Chapters 16 – 18</b>	<b>Midterm examination</b>
Session 20:	<ul style="list-style-type: none"> <li>Halogenation in the <math>\alpha</math>-position</li> <li>Alkylation in the <math>\alpha</math>-position</li> </ul>	Chapter 19.4 – 19.5 (pages 944 – 961)	
Session 21:	<ul style="list-style-type: none"> <li>Addition of carbonyl compounds to the <math>\alpha</math>-position</li> <li>The aldol condensation</li> <li>The Claisen condensation</li> </ul>	Chapter 19.6 – 19.9 (pages 961 – 994)	
Session 22:	<ul style="list-style-type: none"> <li>Special Topics</li> </ul>	Chapter 19.10 – 19.16 (pages 994 – 1014)	
Session 23:	<ul style="list-style-type: none"> <li>Concerted, electrocyclic &amp; cycloaddition reactions</li> </ul>	Chapter 23.1 – 23.4 (pages 1154 – 1170)	Quiz 8
Session 24:	<ul style="list-style-type: none"> <li>Sigmatropic shift reactions</li> <li>The Cope rearrangement</li> </ul>	Chapters 23.5 – 23.9 (pages 1170 – 1196)	

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Session/Date	Topic	Reading	Assignment Due
Session 25:	<ul style="list-style-type: none"><li>Carbohydrates: nomenclature, structure; formation &amp; reactions</li></ul>	Chapter 20.1 – 20.4 (pages 1027 – 1056)	
Session 26:	<ul style="list-style-type: none"><li>The Fischer projections</li><li>Disaccharides &amp; polysaccharides</li></ul>	Chapter 20.5 -20.7 (pages 1056 – 1073)	
Session 27:	<ul style="list-style-type: none"><li>Revision session</li></ul>		Quiz 9
Session 28:	<ul style="list-style-type: none"><li>Revision session</li></ul>		
Week starting	FINAL EXAMINATION		

## Co-Curricular Activities

- none

## Classroom Etiquette

- Toilet breaks should be taken before or after class or during class breaks.
- Food & drink, including gum, are not to be consumed in class, except bottled water.
- Mobile phones should be set on silent and should not be used in class except when instructed by the lecturer.
- Laptops are only to be used for the note-taking activities.
- Please kindly dispose of rubbish in the bins provided.

## NYUL Academic Policies

### Attendance and Tardiness

- Key information on NYU London's absence policy, how to report absences, and what kinds of absences can be excused can be found on our [website](http://www.nyu.edu/london/academics/attendance-policy.html) (<http://www.nyu.edu/london/academics/attendance-policy.html>)

### Assignments, Plagiarism, and Late Work

- You can find details on these topics and more on this section of our NYUL [website](https://www.nyu.edu/london/academics/academic-policies.html) (<https://www.nyu.edu/london/academics/academic-policies.html>) and on [the Policies and Procedures section of the NYU website](https://www.nyu.edu/academics/studying-abroad/upperclassmen-semester-academic-year-study-away/academic-resources/policies-and-procedures.html) for students studying away at global sites (<https://www.nyu.edu/academics/studying-abroad/upperclassmen-semester-academic-year-study-away/academic-resources/policies-and-procedures.html>).

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## Classroom Conduct

Academic communities exist to facilitate the process of acquiring and exchanging knowledge and understanding, to enhance the personal and intellectual development of its members, and to advance the interests of society. Essential to this mission is that all members of the University Community are safe and free to engage in a civil process of teaching and learning through their experiences both inside and outside the classroom. Accordingly, no student should engage in any form of behaviour that interferes with the academic or educational process, compromises the personal safety or well-being of another, or disrupts the administration of University programs or services. Please refer to the [NYU Disruptive Student Behavior Policy](#) for examples of disruptive behavior and guidelines for response and enforcement.

## Disability Disclosure Statement

Academic accommodations are available for students with disabilities. Please contact the Moses Center for Students with Disabilities (212-998-4980 or [mosescsd@nyu.edu](mailto:mosescsd@nyu.edu)) for further information. Students who are requesting academic accommodations are advised to reach out to the Moses Center as early as possible in the semester for assistance.

## Instructor Bio

In 2000, Dr Aga Kosinska graduated from Gdansk University of Technology in Poland with MSc engineer degree in Chemical Technology. In 2001, she started her international adventure across countries and educational systems around the world. In 2003, she began her research in the area of analytical chemistry at the University of San Francisco (USF) where she received: The American Institute of Chemists Foundation Award Certificate as an Outstanding Student Majoring in Chemistry and The Department of Chemistry Graduate Award for Achievement in Teaching. Then, Dr Kosinska moved to the University of St Andrews where she did her PhD studies in the area of organic and medicinal chemistry. Her research focused on the design and synthesis of novel *N*-hydroxyguanidines as NO donors. In 2010, she started working as a Chemistry Teaching Fellow at UCL's Centre for Preparatory Studies in Astana, Kazakhstan. She came back to the UK in 2013, and started working as a Lecturer in Extended Science at Plymouth University. In 2014, she completed Postgraduate Certificate in Academic Practice and become a Fellow of Higher Education Academy. Currently, she is working at the UCL's Centre for Languages and International Education as the Senior Chemistry Teaching Fellow where she has been sharing her innovative learning and teaching approaches to international students.