



## Course Syllabus: Advanced Organic Chemistry I - ChemS 320

<b>Division</b>	Physical Science and Engineering Division
<b>Course Number</b>	ChemS 320
<b>Course Title</b>	Advanced Organic Chemistry I
<b>Academic Semester</b>	Fall
<b>Academic Year</b>	2018/2019
<b>Semester Start Date</b>	08/26/2018
<b>Semester End Date</b>	12/11/2018
<b>Class Schedule</b> (Days & Time)	01:00 PM - 02:30 PM   Mon , 02:30 PM - 04:00 PM   Sun

Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Iain Mcculloch	iain.mcculloch@kaust.edu.sa	+966128084810	3234, 5, Al-Kindi (bldg. 5)	Building 5 R3234 Office hours by appointment.
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Teaching Assistant(s)	
Name	Email

Course Information	
<b>Comprehensive Course Description</b>	Advanced Organic Chemistry I will be focused on the understanding of structure, reactivity, and underlying mechanisms of organic chemistry. The basic mechanisms of organic chemistry underlie the function of biopolymers, drugs, and man-made "smart" materials. A mechanism-focused curriculum will be a convincing demonstration of the pervasiveness and interdisciplinary nature of modern organic chemistry. This course shall provide the students with an understanding of reactivity of organic species.
<b>Course Description from Program Guide</b>	A focus on a deeper understanding of the structure and reactivity of organic molecules with an emphasis on reaction mechanisms. It is a review of aspects of physical organic chemistry, covering structure and bonding, stereochemistry, and kinetics and thermodynamics, as well as molecular orbital theory with an introduction to the use of computational tools, such as Gaussian 09.
<b>Goals and Objectives</b>	The objective of the course is to gain both intuitive and quantitative understanding of the mechanistic aspects of organic chemistry.  <b>Course Contents</b> Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
<b>Required Knowledge</b>	Introductory Organic Chemistry General Chemistry Introductory Physical Chemistry

<b>Reference Texts</b>	<p>Required Text and Class Materials  <i>A Guidebook to Mechanism in Organic Chemistry</i> (Sixth Edition), by Peter Sykes (Prentice Hall, <b>1996</b>). The text is available from the library and as an ebook.</p> <p>Required Software  Current version of HyperChem Professional or a similar molecular modeling program. KAUST has a site license for HyperChem, and an evaluation version is also available. The student should have the software installed on their computer no later than the second week of class.</p> <p>Recommended Reference Books and Resources  1. <i>March's Advanced Organic Chemistry: Reactions, Mechanisms, and Structure</i> (Sixth Edition), by Michael B. Smith and Jerry March (Wiley, 2007), or earlier editions of March.  2. <i>Advanced Organic Chemistry, Part A: Structure and Mechanisms</i> (Fifth Edition), by Francis Carey and Richard Sundberg (Springer, 2007), or any other edition.  3. A plastic molecular modeling set.</p>
<b>Method of evaluation</b>	<p><b>75.00%</b> - Final exam  <b>25.00%</b> - Midterm exam</p>
<b>Nature of the assignments</b>	<p>Problems will be discussed in class as required.</p>
<b>Course Policies</b>	<p>Attendance Policy  Lecture attendance is mandatory. If the student is unable to attend on the date indicated, the instructor will be notified at least a day in advance, and the problem set (if applicable) will be submitted electronically no later than the end of the lecture period.</p> <p>Academic Honesty Policy  The highest levels of academic integrity are expected in this class. The code of student conduct will be strictly enforced. Academic dishonesty will result in reductions in grades and/or expulsion from this class. The specific rules for this class are as follows: Exams are closed book, individual work. Problem sets (if assigned) are open book, individual work. You are free to use any books, journals, databases, computer software or study aids. If you miss one or more lecture periods, and wish to obtain lecture notes for these, you are strongly encouraged to work together with your classmates and obtain the missing notes from them.</p> <p>Proper attribution is expected when using any information from the scientific literature, textbooks, or the Web. Lack of proper attribution or verbatim copying of content will result in an automatic zero grade for an entire quiz, exam question, or problem set.</p>
<b>Additional Information</b>	<p>There is <b>NO</b> grading curve in this class.</p>

## Tentative Course Schedule

*(Time, topic/emphasis & resources)*

Week	Lectures	Topic
1	Sun 08/26/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
1	Mon 08/27/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
2	Sun 09/02/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
2	Mon 09/03/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
3	Sun 09/09/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
3	Mon 09/10/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
4	Sun 09/16/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
4	Mon 09/17/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry

5	Sun 09/23/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
5	Mon 09/24/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
6	Sun 09/30/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
6	Mon 10/01/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
7	Sun 10/07/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
7	Mon 10/08/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
8	Sun 10/14/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
8	Mon 10/15/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
9	Sun 10/21/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry

9	Mon 10/22/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
10	Sun 10/28/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
10	Mon 10/29/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
11	Sun 11/04/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
11	Mon 11/05/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
12	Sun 11/11/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
12	Mon 11/12/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
13	Sun 11/18/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
13	Mon 11/19/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry

14	Sun 11/25/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
14	Mon 11/26/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
15	Sun 12/02/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
15	Mon 12/03/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
16	Sun 12/09/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry
16	Mon 12/10/2018	Aromatic substitutions Carbonyl reactions and formation Haloalkanes, alcohols and amines pKa in organic chemistry Functional group interconversion Synthesis problems Advanced organic chemistry

**Note**

The instructor reserves the right to make changes to this syllabus as necessary.