

**Chem 432, Organic Chemistry**  
**Schedule # \*\*\*\***  
**Fall Semester 2015**

**Professor:** Dr. B. Mikael Bergdahl (bbergdahl@mail.sdsu.edu)  
Office: GMCS 213G  
Phone: (619) 594-5865

**Lecture meetings:** MWF: 11:00-11:50, HH – 130.

**Office Hours:** MW: 9:00-10:50 am and by appointment.

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**Course Materials:**

**Text:** (a) Solomons & Fryhle & Snyder, *Organic Chemistry*, 11<sup>th</sup> Ed., Wiley Publ. 2014  
ISBN: 978-1-118-13357-6.

(b) Solomons, Fryhle, Snyder, *Student Guide and Solutions Manual Organic Chemistry* 11<sup>th</sup> Ed.  
ISBN: 978-1-118-14790-0.

**Lab:** M. Bergdahl, T. Cole, *Laboratory Manual*. (Available at Cal. Copy).

**Tool:** A set of molecular models, such as Prentice-Hall Molecular models, is optional but strongly recommended.

**E-HW:** Sapling Learning, Electronic homework. <http://www.saplinglearning.com/>

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**Expected Student Learning Outcomes:**

a) To be able to understand physical and chemical properties of organic substances such as carbonyl compounds, amines and aromatic substances.

b) To be able to understand the chemical differences between ketones, aldehydes, and carboxylic acids and their derivatives.

c) To be able to determine bonds and hybridizations, aromaticity, and stereochemistry of simple organic carbonyl compounds.

d) To be able to depict chemical mechanisms for various organic reactions in the area of carbonyl chemistry using the curved arrow formalism.

e) To be able to mechanistically understand reduction and oxidation reactions of organic molecules.

f) To be able to determine simple structures of organic compounds based on spectroscopy using infrared (IR) and nuclear magnetic resonance (NMR).

g) To be able to see a connection and similarity between organic chemistry and the application on common "daily life" biochemical processes.

h) To be able to apply and use the outcomes above in more advanced organic chemistry courses, biochemistry, and synthetic organic chemistry.

**Prerequisite:** A grade of "C" or better from Chem 232 or corresponding chemistry course.

**Adding Procedures:** Add codes will be provided first week of class if space allows and pre-req is filled.

**Dropping Procedure:** Students without a pre-req will be dropped from the course by the instructor the first week of class.

**Course Structure and Conduct:** The lecture course consists of three 1-hour face-to-face lectures per week. Lectures will be focused on the theoretical basis and understanding of important concepts of organic chemistry. Power point slides will be presented and complemented with lecture board notes. You will not be penalized for not attending lectures directly, but please be aware that there is a *correlation between attendance and lower course grades in upper division organic chemistry.*

**Student disabilities:** If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that I cannot provide accommodations based upon disability until I have received an accommodation letter from Student Disability Services.

**Course Assessment and Grading:** Three midterm exams will be given on Saturdays outside the regular lecture schedule (**Sept. 26, Oct. 24, and Nov. 21**) from 10:00am - Noon. *Make sure you can take the exams on these dates before enrolling this class!!*. You will be notified about the examination rooms in good time before you take the midterms. The final exam will be given on **Saturday, Dec 12<sup>th</sup>** from **3:30-5:30 PM** (*Group Final, see examination schedule*). No make up exams will be given. Excused absences, substantiated by an appropriate written and signed confirmation, will result in no penalty. Unexcused absences will result in a “zero” and will account for an “F” grade for such exam. Your TA along with the instructor will grade your midterms and final exam. ***Your course grade will be assigned at the end of the semester and will be based on a curve using a +/- assignment.*** (Letter grades will be assigned for each individual exam – the +/- assignment will not be used for specific exams. There are no pre-determined guidelines for the grade distribution. Most students earn a C, but in fact, it is not too difficult to earn a higher grade in organic chemistry. The cut-off for specific grades varies, but in general an “A” accounts for >87%, a “B” >74% and a “C” around 60%. Exam scores will be posted on Blackboard. Course grades will be posted on Webportal.

The laboratory component of the grade will be based on the completion of the experiments, the reports, unknowns, products, quizzes and an evaluation of experimental technique. The laboratory grade is separate from the chem 432 grade.

**Electronic Homework:** Sapling Learning <http://www.saplinglearning.com/>  
Access to Sapling is available in a bundle with the textbook from the SDSU bookstore or by purchasing an access code for ~\$40 directly from Sapling Learning. The Sapling website will direct you to register for this course. eHomework will contribute a maximum of 100 points to your final grade.

**Grading:** Your course grade will be based on 600 points maximum and will be based on your performance on your exams.

In summary;	Midterm 1	100	points
	Midterm 2	100	
	Midterm 3	100	
	Sapling HW	100	
	Final Exam	200	
	<b>Total</b>	<b>600</b>	<b>points (Chem 432)</b>

**Academic Honesty:** The University adheres to a strict policy regarding cheating and plagiarism. These activities will not be tolerated in this class. Become familiar with the policy (<http://www.sa.sdsu.edu/srr/conduct1.html>).

Any cheating or plagiarism will result in failing this class and a disciplinary review by Student Affairs. Examples of Plagiarism include but are not limited to:

- Using sources verbatim or paraphrasing without giving proper attribution (this can include phrases, sentences, paragraphs and/or pages of work)
- Copying and pasting work from an online or offline source directly and calling it your own
- Using information you find from an online or offline source without giving the author credit

- Replacing words or phrases from another source and inserting your own words or phrases
- Submitting a piece of work you did for one class to another class

If you have questions on what is plagiarism, please consult the policy

(<http://www.sa.sdsu.edu/srr/conduct1.html>)

and this helpful guide from the Library:

([http://infodome.sdsu.edu/infolit/exploratorium/Standard\\_5/plagiarism.pdf](http://infodome.sdsu.edu/infolit/exploratorium/Standard_5/plagiarism.pdf))

**Chem 432L:** The laboratory component of the grade will be based on the completion of the experiments, the reports, unknowns, products, quizzes and an evaluation of experimental technique. The laboratory grade (chem 432L) is separate from the chem 432 grade.

You must attend your first scheduled lab or your spot may be forfeit!

*Chem 432 Lab Crashers:*

Crashers will be taken on a lottery basis depending on the availability of space.

- Preference will be given to SDSU enrolled students, “open university” students will be accepted, provided no SDSU enrolled student participates in the lottery.
- Preference will be given to students taking Lecture and Lab concurrently.
- Students enrolled must show up for the first day of the lab.
- To keep their space in the lab, failure to show-up after 1hr the space will be given to crasher.
- Add codes for the lecture (students who are repeating the lecture to get a better grade, provided they passed the lab) may be obtained from the instructor only if space allows.
- Crashers obtaining a lab space will be provided an add code to lecture.

**To the student and how to succeed in Organic Chemistry (and science in general):**

1. *Develop good study habits:*
  - a. Attend all lectures and labs.
  - b. Take good lecture notes.
  - c. Use your lecture notes as a guide to your reading in the textbook. Write your questions down if there is something you don't understand. Ask your instructor if you don't understand a concept.
  - d. Make flash cards of definitions, concepts, reactions, structures, and nomenclature that are in the textbook that are emphasized by your instructor in lecture. Writing something is equivalent to reading it ten times.
  - e. Do all the homework problems with the aid of the study guide or answer book. The suggested problems (homework) have about the same difficulty as the problems you will be given on the exams.
  - f. One of the alternative ways to learn, is to find a study partner or to form a study group and work on problems independently and then together.
  - g. Keep up to date and don't fall behind.
  - h. Seek course advice from science professors and students.
  - i. If necessary, see your instructor or department for a tutor.
  - j. Try to see the "big picture"; try to see how the topic of the week fits in with the whole course. If you have a difficulty achieving this, ask your instructor.
  - k. Practice applying what you have learned in class to the world around you.
  - l. Try to foster your own scientific curiosity – wonder why things are and how they happen.
  - m. Put emphasis on understanding concepts rather than memorizing material.
  - n. If you read the text more than 10 minutes without practicing a problem, something is wrong.....this is not how you should study organic chemistry.
2. *Have a positive attitude.*
3. *Realize that science requires more self discipline than many other majors, but actually offers more rewards.*
4. *Be organized.*
5. *Persevere and be determined to succeed.*

Good Luck in Chem 432!!

Mike Bergdahl

**Ithaca** (a philosophical view of The Organic Chemistry )

by [Constantine P. Cavafy](#)

(1863 - 1933)

When you set out on your journey to Ithaca,  
pray that the road is long,  
full of adventure, full of knowledge.  
The Lestrygonians and the Cyclops,  
the angry Poseidon -- do not fear them:  
You will never find such as these on your path,  
if your thoughts remain lofty, if a fine  
emotion touches your spirit and your body.  
The Lestrygonians and the Cyclops,  
the fierce Poseidon you will never encounter,  
if you do not carry them within your soul,  
if your soul does not set them up before you.

Pray that the road is long.  
That the summer mornings are many, when,  
with such pleasure, with such joy  
you will enter ports seen for the first time;  
stop at Phoenician markets,  
and purchase fine merchandise,  
mother-of-pearl and coral, amber, and ebony,  
and sensual perfumes of all kinds,  
as many sensual perfumes as you can;  
visit many Egyptian cities,  
to learn and learn from scholars.

Always keep Ithaca on your mind.  
To arrive there is your ultimate goal.  
But do not hurry the voyage at all.  
It is better to let it last for many years;  
and to anchor at the island when you are old,  
rich with all you have gained on the way,  
not expecting that Ithaca will offer you riches.

Ithaca has given you the beautiful voyage.  
Without her you would have never set out on the road.  
She has nothing more to give you.

And if you find her poor, Ithaca has not deceived you.  
Wise as you have become, with so much experience,  
you must already have understood what these Ithacas mean.

**Homework problems (Solomons & Fryhle, *Organic Chemistry*, 11<sup>th</sup> Ed.).**

**Chapter 12, Alcohols from Carbonyl Compounds:**

2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,37,38

**Chapter 13, Conjugated Unsaturated Systems:**

1,2,3,4,5,6,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,25,26,28,29,30,31,32,33,34,36,37,38,39,40,  
41,42,43,44,45,46,50

**Chapter 14, Aromatic Compounds:**

2,3,4,5,6,7,12,16,17,18,19,20,21,22,23,24,25,26,27,30,31,33

**Chapter 15, Reactions of Aromatic Compounds:**

2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,28,29,30,31,32,33,34,35,36,37,38,  
39,40,41,42,52

**Chapter 16, Aldehydes and Ketones:**

2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,38,  
41,42,43,44,45

**Chapter 17, Carboxylic Acids and Their Derivatives:**

2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,18,21,22,23,24,25,26,27,28,29,30,31,32,33,35,36,37,40,41,42,44

**Chapter 18, Reactions at the  $\alpha$  Carbon of Carbonyl Compounds:**

1,2,3,4,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30

**Chapter 19, Condensation and Conjugate Addition Reactions of Carbonyl Compounds:**

1,2,3,4,5,6,7,8,9,10,11,12,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,33,34,35,36,37,38,  
39,40,41,42,43,44,45,46,47,48,49,52

**Chapter 20, Amines:**

1,2,3,4,5,6,9,10,11,12,13,14,17,19,21,22,23,24,25,26,27,28,29,31,34,37,43,44

**Chapter 9, Nuclear Magnetic Resonance and Mass Spectrometry:**

Handout

**Chapter 21, Phenols and Aryl Halides:**

1,2,3,4,9,10,11,12,13,14,15,17,18,19,20,22,23,24,25,27

**Chapter 22, Carbohydrates:**

1,2,3,4,5,7,8,9,10,11,12,20,21

**Lecture and Exam schedule; Chem 432, Fall 2015**

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<b>24-Aug</b> <i>Chapter 12</i> <i>Introduction</i>	<b>25-Aug</b>	<b>26-Aug</b> <i>Ch. 12 cont.</i>	<b>27-Aug</b>	<b>28-Aug</b> <i>Ch. 12 cont.</i>	
<b>31-Aug</b> <i>Ch. 12 cont.</i>	<b>1-Sep</b>	<b>2-Sep</b> <i>Ch. 12 cont.</i>	<b>3-Sep</b>	<b>4-Sep</b> <i>Chapter 13</i>	
<b>7-Sep</b> <b>Holiday</b> <b>Labor Day</b>	<b>8-Sep</b>	<b>9-Sep</b> <i>Ch. 13 cont.</i>	<b>10-Sep</b>	<b>11-Sep</b> <i>Ch. 13 cont.</i>	
<b>14-Sep</b> <i>Ch. 13 cont.</i>	<b>15-Sep</b>	<b>16-Sep</b> <i>Chapter 14</i>	<b>17-Sep</b>	<b>18-Sep</b> <i>Ch. 14 cont.</i>	
<b>21-Sep</b> <i>Ch. 14 cont.</i>	<b>22-Sep</b>	<b>23-Sep</b> <i>Chapter 15</i>	<b>24-Sep</b>	<b>25-Sep</b> <i>Ch. 15 cont.</i>	<b>26-Sep</b> <i>Midterm 1</i>
<b>28-Sep</b> <i>Ch. 15 cont.</i>	<b>29-Sep</b>	<b>30-Sep</b> <i>Ch. 15 cont.</i>	<b>1-Oct</b>	<b>2-Oct</b> <i>Ch. 15 cont.</i>	
<b>5-Oct</b> <i>Chapter 16</i>	<b>6-Oct</b>	<b>7-Oct</b> <i>Ch. 16 cont.</i>	<b>8-Oct</b>	<b>9-Oct</b> <i>Ch. 16 cont.</i>	
<b>12-Oct</b> <i>Chapter 17</i>	<b>13-Oct</b>	<b>14-Oct</b> <i>Ch. 17 cont.</i>	<b>15-Oct</b>	<b>16-Oct</b> <i>Ch. 17 cont.</i>	
<b>19-Oct</b> <i>Ch. 17 cont.</i>	<b>20-Oct</b>	<b>21-Oct</b> <i>Ch. 17 cont.</i>	<b>22-Oct</b>	<b>23-Oct</b> <i>Chapter 18</i>	<b>24-Oct</b> <i>Midterm 2</i>
<b>26-Oct</b> <i>Ch. 18 cont.</i>	<b>27-Oct</b>	<b>28-Oct</b> <i>Ch. 18 cont.</i>	<b>29-Oct</b>	<b>30-Oct</b> <i>Ch. 18 cont.</i>	
<b>2-Nov</b> <i>Ch. 18 cont.</i>	<b>3-Nov</b>	<b>4-Nov</b> <i>Chapter 19</i>	<b>5-Nov</b>	<b>6-Nov</b> <i>Ch. 19 cont.</i>	
<b>9-Nov</b> <i>Ch. 19 cont.</i>	<b>10-Nov</b>	<b>11-Nov</b> <b>Holiday</b> <b>Veterans Day</b>	<b>12-Nov</b>	<b>13-Nov</b> <i>Ch. 19 cont.</i>	
<b>16-Nov</b> <i>Ch. 19 cont.</i>	<b>17-Nov</b>	<b>18-Nov</b> <i>Chapter 20</i>	<b>19-Nov</b>	<b>20-Nov</b> <i>Ch.20 cont.</i>	<b>21-Nov</b> <i>Midterm 3</i>
<b>23-Nov</b> <i>Ch.20 cont.</i>	<b>24-Nov</b>	<b>25-Nov</b> <b>Holiday</b> <b>Thanksgiving</b>	<b>26-Nov</b> <b>Holiday</b>	<b>27-Nov</b> <b>Holiday</b>	
<b>30-Nov</b> <i>Chapter 9</i>	<b>1-Dec</b>	<b>2-Dec</b> <i>Ch.9 cont.</i>	<b>3-Dec</b>	<b>4-Dec</b> <i>Chapter 21</i>	
<b>7-Dec</b> <i>Ch.21 cont.</i>	<b>8-Dec</b>	<b>9-Dec</b> <i>Review</i>	<b>10-Dec</b> <i>Last day of class</i>	<b>11-Dec</b> <i>Final's Week</i> <i>Begins</i>	<b>12-Dec</b> <i>Final Exam</i>
<b>14-Dec</b>	<b>15-Dec</b>	<b>16-Dec</b>	<b>17-Dec</b>	<b>18-Dec</b>	

**Chemistry 432 Midterm Exam Dates: Sep 26, Oct 24, and Nov 21; 10:00 am - Noon**

**Chemistry 432 Final: Saturday Dec 12, 15:30-17:30**