

CHEM 622 – PHYSICAL ORGANIC CHEMISTRY

SPRING 2010

Instructor: Dr. Wei Zhang
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Classes: Monday and Wednesday 5:30-7:00 pm
Room: S2-0063

Office Hours: Monday and Wednesday, 10:00 am to 12:00 pm

Text: Advanced Organic Chemistry – Part A: Structure and Mechanisms, 5th Ed. 2007, Carey and Sundberg

References: Advanced Organic Chemistry / Jerry March
Modern Physical Organic Chemistry / Anslyn and Dougherty
Physical Organic Chemistry / Neil Isaacs
Advanced Organic Chemistry / Bernard Miller

This course has three parts. The first part covers the principle of stereochemistry, conformational analysis, asymmetric synthesis, and correlation of structure with reactivity. The second part describes different types of reactions and their mechanisms including substitution, addition, elimination, rearrangement, pericyclic, free radical, and photochemical reactions. The third part presents selected topics such as heterocyclic chemistry, multicomponent reactions, and organocatalysis. Students are also asked to give a short presentation on selected papers related to Part three of this course.

Homework: Will be given but not graded.

Exams:

- Three 1-hour exams (the one with the lowest score dropped)
- A 2-hour final exam
- An oral presentation (~20 min) on selected papers

No make up exams. If you miss a one-hour exam, the remaining two account. Contact me in advance in case of any serious problems

Grading:

Two 1-hour exams:	2 x 100
Final exam:	200
Presentation:	<u>100</u>
Total:	500

Final grades will be calculated as follows:

Points	%	Grade	Points	%	Grade
500-450	>90	A	349-330	>66	C
449-430	>86	A-	329-310	>62	C-
429-410	>82	B+	309-290	>58	D+
409-390	>78	B	289-270	>54	D
389-370	>74	B-	269-250	>50	D-
369-350	>70	C+	below 250	<50	F

Tentative Course Outline

<i>Part One - Molecular Structures</i>		
Date	Topic	Chapter
Jan. 25, M	course introduction	--
Jan. 27, W	chemical bonding	1
Feb. 1, M	stereochemistry	2
Feb. 3, W	stereochemistry	2
Feb. 8, M	conformational analysis	2
Feb. 10, W	stereoselectivity	2
Feb. 15, M	President day, no class	--
Feb. 17, W	stereoselectivity	2
Feb. 22, M	structure effect on reactivity	3
Feb. 24, W	structure effect on reactivity	3
Mar.1, M	1st hourly exam	1-3

<i>Part Two – Reaction and Mechanisms</i>		
Date	Topic	Chapter
Mar. 3, W	substitution	4
Mar. 8, M	polar addition	5
Mar. 10, W	polar elimination	5
Mar. 15, M	spring break, no class	--
Mar. 17, W	spring break, no class	--
Mar. 22 M	carbonyl reactions	7
Mar. 24, W	aromatic reactions	8,9
Mar. 29, M	pericyclic reactions	10
Mar. 31, W	pericyclic reactions	10
Apr. 5, M	2nd hourly exam	4-10
Apr. 7, W	free radical reactions	11
Apr. 12, M	photochemistry	12

<i>Part Three – Special Topics</i>		
Date	Topic	Chapter
Apr. 14, W	heterocyclic chemistry	Topic I
Apr. 19, M	Patriots day, no class	--
Apr. 21, W	multicomponent reactions	Topic II
Apr. 26, M	organocatalysis	Topic III
Apr. 28, W	3rd hourly exam	11,12 + special topics
May 3, M	student presentations	
May 5, W	student presentations	
May 10, M	student presentations	
May 12, W	review for final	
May 17, M	final exam	

Classroom Rules: According to the general policy students should come to all classes. Please arrive on time and stay through the class.

Information on “University Policies” & “Code of Conduct”:

http://www.umb.edu/students/student_rights/index.html

http://www.umb.edu/student_affairs/code.html