

Chemistry 748 Physical Organic Chemistry –Spring 2019: Syllabus

General:

Instructor: Dr. Scott Gronert and Dr. Alexander Arnold
Office Room: 372c Chemistry Building
Office Hours: any time and by email appointment
Email address: sgronert@uwm.edu and arnold2@uwm.edu
Lecture: TR 3:00-4:15 pm, room: CHM 193
Official start date: Tuesday, 3rd September 2019
Pre-requirement: Graduate

Description:

The goal of this course is to mediate the principles of the relationships between structure and reactivity of organic molecules. To achieve this goal, we will discuss several chapters of the textbook "Modern Physical Organic Chemistry". These will include a review on structure, energy, and solvation; pKa and the influence of substituents on reactivity and activity; and specialty topics such as photochemistry, supramolecular chemistry, and polymerization. The course is designed to dissect the different forces of molecules to increase the understanding of reactivity. This knowledge will help the organic chemistry student to pick appropriate solvents and reactants for chemical conversion and stimulate new ideas applicable for their research. The student will have the opportunity to present an important topic of physical organic chemistry. Additionally, we will discuss selected chemistry and biochemistry highlights.

Course Load:

The student is required to attend class 748 scheduled for two times 75 minutes per week and urged to spend at least the same amount of time to read the textbook and study the student problems described in the book.

Lecture:

Your presence is mandatory for this course. Excuses are expected to have a valid reason (medical, scholar ...). Frequent absence will result in a diminished grade. Taking lecture notes is an essential skill, which is too often neglected. Part of the learning process involves thinking about what is being said in lecture, writing it down, and even re-writing it to clarify what you have heard. I may ask specific questions on the final exam from lectures, based on material that you will not find in the book.

Homework:

I will give homework questions from the book exercises after each class and will ask students to solve these problems in the beginning of the next class using the chalk board.

Seminar:

Each student will prepare one seminar chosen from the seminar topics of this syllabus. The presentation is expected to be 30-40 minutes. Subsequently, there will be a discussion.

Mid-term exam:

There will be no mid-term exam.

Final Exam:

The final exam consists of several questions and the students have 75 minutes to solve the problems summarizing the material discussed in the class. This exam is mandatory!

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Grading:

Seminar = 50 pts

Final Exam = 50 pts

Total = 100 pts

Textbook:

Modern physical organic chemistry “Eric V. Anslyn and Dennis A. Dougherty” ISBN 1-891389-31-9, University Science Books

Policies:

UWM: You must follow the policies and procedures outlined in the current Schedule of Classes.

See: <http://www.uwm.edu/Dept/SecU/SyllabusLink.pdf>

Department of Chemistry: You are expected to fully understand the policies posted on the bulletin boards across from CHM 195 and adjacent to CHM 164.

Drop, Section Change: Most changes can be made on PAWS. Make sure you check-out of laboratory to avoid having a “hold” placed on your records.

Incomplete: An incomplete can be given only to a student who has been doing satisfactory (C or better) work but who is unable to continue attending the course for a reason judged valid. The request for an Incomplete must be accompanied by documentation.

Academic Dishonesty: Cheating on an examination or other graded material will result in a grade of zero as a minimum consequence. Failure in the course and referral to the Dean may also occur. In short, academic dishonesty in any form will not be tolerated.

Tentative Course Outline:

Below is an approximate outline. Significant amount of class time will be dedicated to discussions, thus it is hard to anticipate how far we will be able to advance, and how deep will the material be covered.

Day	Reading (Textbook, Modern Phys. Org. Chem.)
3rd September	welcome/syllabus/presentations/ 1.1
5th September	1.1-1.2
10th September	Carbene ligands in organic chemistry
12th September	1.3-1.4
17th September	exercises
19th September	Stable radicals and their application
24th September	2.1-2.3
26th September	exercises
1st October	Fullerene-Synthesis, Structure, and Application
3rd October	2.4-2.6
8th October	Adamantane-Synthesis, Structure, and Application
10th October	3.1-3.2
15th October	3.3/exercise
17th October	Surfactants-Aggregation, Forces, and Application
22nd October	4.1-4.2
24th October	4.3/exercises
29th October	Cyclodextrines-Synthesis and Application
31st October	5.1-5.3

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5th November	5.4-5.5/exercises
7th November	8.1-8.2
12th November	Organic Superbases-Synthesis and Application
14th November	8.2-8.4/exercise
19th November	Analysis of Phenanthreneaminoalkylcarbinol Antimalarials SAR using Hansch equation
21th November	16.1-16.3
26th November	16.4-16.5
3th December	Molecular Switches and Motors- Synthesis and Properties
5th December	13.1
10th December	13.2/exercise
14th December	final

Disclaimer:

Teaching policies and regulations for this course are not open for discussion or negotiation. This syllabus has been constructed to be as complete as possible but is by no means a binding document. I reserve the right to alter policies and regulations as needed.