

Organic Materials Chemistry (CHM446/1304) Winter 2019

Course Instructor: Prof. Dwight Seferos

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Lecture Place/Time: TBD, Thursdays 1-3 PM

(Office Hours: LM 616 Thursdays 3-4 PM, or by appointment)

Overview. Welcome to Organic Materials Chemistry! Not all organic chemistry involves the preparation of compounds for the pharmaceutical industry. In this course we will learn to design, synthesize, characterize and apply organic matter for high-tech uses. Emphasis is placed on classic examples of organic materials including semiconducting polymers, molecular devices, self-assembled systems, molecular machines, as well as recent advances from the literature. You will study how structure in organic molecules dictates materials properties and ultimately leads to function. The objective of the course is learning structure-property-function relationships in carbon-based materials. Course information will be posted on the website (i.e. Quercus). **Please check frequently for updates.**

Prerequisites: CHM247H or CHM249H, CHM220H or CHM225Y.

Recommended preparation: CHM325H and CHM342H/343H.

Text: There is no dedicated text for this course. Journal articles and review papers will be made available to complement the lecture notes.

Topics and Tentative Schedule (subject to change):

Lecture 1	Introduction, molecular machines, high carbon-content materials (Jan 10)
Lectures 2-3	Semiconducting polymers, molecules, carbon nanotubes, graphene (Jan 17, 24)
Lecture 4	Organic light-emitting devices (Jan 31)
Lecture 5	Molecular modeling assignment discussion (Feb 7)
Lecture 6	In class mid-term (Feb 14)
Lecture 7	Organic solar cells (Feb 28)
Lecture 8	Singlet exciton fission and applications (Mar 7)
Lecture 9	Organic thin film transistors (Mar 14)
Lecture 10	Organic energy storage (Mar 21)
Lecture 11	Organic thermoelectrics (Mar 28)
Lecture 12	The future of organic electronics (April 4)

CHM 446 Grading

Midterm (1 hour will take place during class)	20%
Assignment (due on or before 1 PM on April 4)	40%
Final (2 hour exam, dates posted later in the term)	40%

Both the mid-term and final will consist of essay style exam questions that may involve writing an explanatory essay and/or using illustrations to describe chemical structures, reaction schemes, mechanisms, or other processes related to organic materials chemistry. Exam questions are based on the lecture materials and/or assigned readings and/or the course assignment. Answers must be written in blue/black ink in a blue exam book. Partial credit will be given if possible. Answers must be clearly legible.

CHM 1304 Grading

Midterm (1 hour will take place during class)	15%
Take home midterm	15%
Assignment (due on or before 1 PM on April 4)	30%
Final (2 hour exam, dates posted later in the term)	40%

Students enrolled in the graduate section will have an additional component to the midterm that is take home and expected to be completed over the reading week (Feb 18-22). More information will be provided later in the term.

CHM446H/CHM1304H Assignment

The assignment is due on or before 1 PM on April 4, 2019. You must hand in a hard copy at the beginning of class and submit an electronic copy by 1 PM on April 4, 2019. Late assignments are deducted 10% per day. An assignment is considered 1 day late if it is received 1 minute past the day/time it is due. A suggested report format will be given later in the term.

Normally, students will be required to submit their course essays to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site.

Tentative marking scheme – total 50 points (40% of course grade)

Abstract – 3 points

Introduction – 5 points

Results and Discussion – 30 points

Conclusions – 5 points

Methods – 5 points

References – 2 points