## Syllabus Chemistry 386J, Fall 2017

Physical Organic Chemistry

**Course:** TTh 12:30-2:00pm, Welch 3.402, Saturdays 9:00 to noon when listed below.

**Prof.** Eric V. Anslyn, Office Hours, NHB 5.144, Tuesdays 10:00am-11:00am, and Thursdays 2:00-3:00pm. I love talking about this course material, so please drop by. I highly encourage you to come to office hours. I am going to get on your case if you are not coming to office hours.

## **Teaching Assistants:**

Brenden Herrera, Office hours: Tuesdays 9-10am, NHB Conf. Rm. 5.202 Rogelio Escamilla, Office hours: Wednesdays 1:30-2:30pm, NHB Conf. Rm. 5.202

Recitation sessions are Fridays at 9:00-10:00am. NHB Conf. Rm. 4.202.

a) 9/8

- b) 9/22
- c)  $10/6^*$
- d) 10/20
- e) 11/3\*
- f) 11/17
- g) 12/1
- h) 12/8\*
  - \*=before exams

**Text:** Modern Physical Organic Chemistry, by Anslyn and Dougherty. You can get the answer key if you like. We do not post the answers to the homework. I will try to cover chapters 1, 2, 5, 6, 7, 8, 9, 10, 11, 15, and 16 – which means we have got to move super quick! The sequence of chapters given here is not set. We will not cover all sections of each chapter.

**Course Website:** <u>http://anslyn.cm.utexas.edu/courses/CH386</u>]. This site will have postings of old exams (with a key if it is available, we don't make new keys).

**Travel:** I am traveling quite a lot this semester, particularly in September. So, we will have several classes on the Saturday mornings (9:00am to noon) that I am in town. All exams are on Saturday mornings also (9:00am to potentially noon). Please arrange to have all your Saturday mornings open. Following are the dates that I will miss class, the Saturday classes, and the exam days. This may change during the semester.

Class dates I will miss. These are subject to change because more traveling may be added. There will be no class on these days, except for September  $7^{\circ}$  when Brenden and Rogelio will run the class.

September 5<sup>th</sup> September 7<sup>th</sup> (special class, arrow pushing) September 12<sup>th</sup> September 19<sup>th</sup> October 3<sup>.,</sup> November 21<sup>.,</sup> November 23<sup>.,</sup> (Thanksgiving)

Saturday classes for a maximum of three hours from 9:00am to noon (Welch 2.140) September 2<sup>nd</sup> September 16<sup>th</sup> September 23<sup>rd</sup> October 14<sup>th</sup> November 11<sup>th</sup> December 2<sup>nd</sup>

Exam dates, Saturdays at 9:00am (Welch 2.140) The TAs (and I when possible) will administer the exams. October 7<sup>th</sup> November 4<sup>th</sup> December 9<sup>rd</sup>

Final exam: Monday December 18<sup>th</sup>, 9:00am-noon - room to be announced

**Weapons:** Whereas the Texas concealed weapons act allows those with permits to carry during the classroom sessions, weapons are not allowed on the floor on which my office hours operate.

**Grading:** There will be three midterms scheduled on the days listed above. Each midterm will be worth 30% of your grade. The lowest of the three grades will be dropped. Therefore, you can miss one midterm without affecting your grade. The final exam is comprehensive and mandatory. It is worth 40% of your grade. All of these exams are best described as extremely challenging. We will also collect homework assignments, which will be passed in and graded. The homework is graded solely on a good (+), fair (-), or you failed to turn it in (0), and will be only used to change the letter grade up or down in borderline cases. The homework is due the lecture period after the chapter has been finished. We are also having you turn in one of the posted practice exams the Saturday during which the exams are held. These will be simply graded with a (+) or (0) depending upon whether you turned it in or not.

## **Chapter Section Reading:**

Appendix 5 1.1-1.4 All of 2 All of 5 except 5.2.5 6.1-6.5 7.1-7.5, 7.7, 7.8 All of 8 except 8.1.4, 8.1.5, 8.1.6, 8.4.3, 8.4.6 9.3 10.1-10.4, 10.13 11.5 15.1, 15.2 (no State Correlation or Aromatic Transition State Theory) 15.3, 15.4 (not 15.4.4), 15.5, 15.6 16.1, 16.2

## Homework:

Appendix 5, 1-3 Chapter 1: 1, 2, 5, 6, 9, 16, 20, 21, 23, 29, 34 Chapter 2: 1, 6, 8, 9, 15, 23, 35, 40, 44, 50 Chapter 5: 2, 3, 9, 11, 14, 19, 22 Chapter 6: 5, 8, 9, 16, 17, 20, 22, 32 Chapter 7: 2, 7, 8, 9, 13, 15, 16, 17, 22 Chapter 8: 9, 10, 12, 13, 16, 18, 19, 21, 22, 25a.b., 28 Chapter 9: 1, 4, 10, 11, 12, 13, 16, 17 Chapter 15: 4, 5, 20, 22, 23, 25, 26, 27, 37 Chapter 16: 3, 41, 50

Chapter 10: <u>4-6, 12, 19, 20, 23-24, 26, 31-33, 38, 39, 41, 42, 46, 47 (MAYBE)</u> Chapter 11: <u>2-5, 11, 13, 18, 20-22, 24, 29, 39, 51 (MAYBE)</u>

And practice exams to be turned in on exam days, passed out a week in advance.

**Course Goal:** The goal of physical organic chemistry is to understand the details of reaction mechanisms and gain insight into structures and reactivity common to organic chemicals and to high-energy chemical intermediates. In this regard, the majority of work is aimed at defining the nature of the reaction coordinate: the structure of any intermediates, the extent to which bonds have been formed or broken in the transition states, and the relative energy of reactants, products, intermediates, and transition states.

The specific goal of this course is to introduce the students to concepts necessary to solving mechanistic organic problems encountered in the research laboratory. Common organic reaction mechanisms, common experimental techniques, and theoretical approaches to understanding reaction mechanisms will be covered. After completion of the course, the student should be confident in designing experiments to probe mechanistic questions, choose theoretical approaches to address chemical problems, and invoke known mechanisms and intermediates to explain observed phenomena.