Chemistry 4011/8011
Mechanisms of Chemical Reactions
Fall 2017
MWF 10:10 am – 11:00 am, Smith 231
and optional review sections (to be announced)

Instructor: Professor Kent R. Mann
668b Kolthoff Hall, 5-3563
krmann@umn.edu
Office hour: to be announced

TA: Caitlin Bouchey
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Office hour: to be announced

Materials:

Chemical Kinetics & Reaction Mechanisms, 2nd Edition
Publisher: MCGRAW HILL BOOK COMPANY
Required (Also on reserve, Walter Library)

Determination of Organic Reaction Mechanisms
Publisher: Wiley
Optional (Also on reserve, Walter Library)

Modern Physical Organic Chemistry
Publisher: UNIVERSITY SCI BOOKS
Optional (Also on reserve, Walter Library)

Inorganic and Organometallic Reaction Mechanisms, 2nd
Author: Jim D. Atwood; ISBN 1560816422 Publisher VCH
Publishers, INC.
Optional (Also on reserve, Walter Library)

Chemical Kinetics and Dynamics
Authors: Steinfeld, Jeffrey I. Francisco, Joseph Salvadore.;
Optional (Also on reserve, Walter Library)

M. R. Wright, An Introduction to Chemical Kinetics (John
Wiley and Sons, Chichester, UK, 2004). On reserve, Walter
Library.
The link for the class website:  http://www1.chem.umn.edu/class/8011/mann17f/.

Course Summary:

“Mechanisms of Chemical Reactions” is NOT a “differential equations” class and it is NOT an “organic chemistry arrow pushing” class either!

It is intended to prepare you to elucidate the mechanisms of chemical reactions based on kinetic and thermodynamic principles, to collected data, and to evaluate mechanistic arguments made in the literature. The course is meant to be broadly applicable to many types of chemistry— inorganic, organic, physical, materials, computational, etc. **We will focus on basic principles of reactions in solutions and at surfaces.**

Grading:  

<table>
<thead>
<tr>
<th>Course</th>
<th>Exams</th>
<th>Problem sets/quizzes</th>
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</thead>
<tbody>
<tr>
<td>4011 (3 cr)</td>
<td>70%</td>
<td>30%</td>
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<tr>
<td>8011 (4 cr)</td>
<td>60%</td>
<td>30%</td>
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<td>10%</td>
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A different final grading scale is used for 4011.

**Exams:** The four exams will be weighted equally. The first three exams will take place during the evening, at times that are already determined (below). No make up exams will be given. If you miss an exam for a valid reason (below), the other three exams will be reweighted appropriately. There will be no “final exam” for this course, though the fourth exam will take place during the time normally scheduled for the final (8:00 – 10:00 a.m., Thursday, December 21); see: http://onestop.umn.edu/calendars/final_exams/. Exams will be open book and open notes; you may bring any materials you see fit to exams. However, student cooperation (including sharing materials or notes) and the use of unapproved electronic devices (computers cell phones and others) on exams is prohibited. You may be excused from taking an exam due to jury duty, subpoenas, military service, religious holidays, and participation in school sports events only if the instructor is notified two weeks in advance. You may also be excused in case of illness (as verified by a doctor's note) or death in the immediate family (be prepared to verify) if the instructor is notified within 24 hours after the exam.

Exam 1: 6:30 p.m. - 9:00 p.m. Wednesday, October 11, 2017 Room 331 Smith Hall

Exam 2: 6:30 p.m. - 9:00 p.m. Wednesday, November 1, 2017 Room 331 Smith Hall

Exam 3: 6:30 p.m. - 9:00 p.m. Monday, November 20, 2017 Room 331 Smith Hall

Exam 4 :(Final Exam set by University): 8:00 a.m. - 10:00 a.m. Thursday, December 21, 2017 Room 231 Smith Hall
**Problem Sets:** Problem sets will be assigned periodically during the semester. The problem sets will be made available on the course website or sent by e-mail at least a week in advance of the due date, and earlier in most cases. Answer keys will be available on the web on the due date. Because the answer keys will be available immediately after the problem sets are due, sets cannot be turned in late. Due to a lack of adequate TA grading time problem sets will not be directly graded. Points will be assigned for handing in the solutions to a problem set. Instead a very short quiz (usually one or two questions) will be given on the due date of the problem set. You will be allowed to use your completed problem set to write down the answers. **The time given for these quizzes (5 minutes or less) will not be adequate for you to compute the answers “on the spot” and you will need to hand in a problem set solution to receive any points for the quiz.** Working together on problems is *highly* encouraged, but you must submit your own copy of your own solutions to receive credit. Identical computer printouts of the same answer from different students will not be accepted. Some of the work for the problem sets will require computer work (Excel or Mathematica, for example) at the Chemistry Department Microcomputer Lab (http://www1.chem.umn.edu/services/microlab/); you should become familiar with this resource.

**Quizzes:** Many lectures will start out (or end) with a short (5 minutes) quiz. These can be announced or not. They can cover material in the problem sets (as described above), previous lectures, readings or the lecture of that day. They will be graded and the points will be added in to the problem set points.

**Paper:** Students enrolled in Chem 8011 (4 cr) will also be assigned a paper on a specific research topic in chemical kinetics and/or thermodynamics. More information about this assignment will be available after class begins.

**E-mail policy:**

All students and instructors should be reachable at their University-wide e-mail accounts.

**Academic Integrity:** Academic integrity is essential to a positive teaching and learning environment. All students enrolled in University courses are expected to complete coursework responsibilities with fairness and honesty. Failure to do so by seeking unfair advantage over others or misrepresenting someone else’s work as your own can result in disciplinary action. More information on the definition and consequences of academic dishonesty can be found at the Office for Student Academic Integrity website (http://www1.umn.edu/oscai/). In this course, direct copying of homework assignments or lab reports, or any cooperation on exams, will be considered dishonest. Any student responsible for scholastic dishonesty can be assigned a penalty up to and including an "F" or "N" for the course. If you have any questions regarding the expectations for a specific assignment or exam, please ask.

Our goal is to be as available and as accommodating as we can be. If you are having troubles or concerns about the class, please feel free to contact us directly and early.

We hope you learn a lot this semester in our course!