Syllabus (Fall 2014)
Chemistry 662: Chemical Kinetics and Dynamics

The policies and regulations contained in this syllabus are subject to change at any point. Such changes will be announced in class and/or posted on the course website. The syllabus has been compiled to be as complete as possible but is by no means a binding document.

General Info
Instructor: Prof. Jörg C. Woehl
Office: Chemistry Building, Room 343 (CHM 343)
Office hours: Open door and by appointment
Email: woehl@uwm.edu
Phone: 414-229-5223

Class Meeting Times: Tuesday and Thursday, 3:30-4:45 pm
Class Location: Lapham Hall, Room 271 (LAP 271)
First Day of Class: Tuesday, September 2
Last Day of Class: Thursday, December 11
Midterm (take-home): Thursday, November 6; due Thursday, November 13
Final Exam: Monday, December 15, 3:00-5:00 pm

Course Objectives
This course is both an introduction to and advanced treatment of Chemical Kinetics. In contrast to a traditional lecture course, we will make use of a computational programming environment (Matlab) in order to explore the theoretical foundations of chemical kinetics and use it as a tool for advanced simulations and problem solving.

Required Textbook
"MATLAB Student (unbundled)" ($50; MATLAB only) & "Symbolic Math Toolbox" ($10 if ordered at same time) or
"MATLAB and Simulink Student Suite" ($99; includes Symbolic Math Toolbox and other add-on products)
R2014a available in the UWM bookstore and online at www.mathworks.com/store.

Optional Textbook
This edition can be purchased at the UWM Bookstore (UWM Union) and may also be available at the Neebo Bookstore (3132 N Downer Ave). It can also be ordered directly from the publisher, Pearson Higher Education.

Supplemental Textbooks


Course Prerequisites

“Chemistry 662: Chemical Kinetics and Dynamics” (Chem-662) requires Senior Status and Grade of C or better in CHM 562 (Physical Chemistry II).

Lectures

Your attendance of all lectures is expected. This is a graduate level class, and I expect you to take the necessary steps to take ownership of the material. You know best whether you have truly understood a particular topic and whether you need to read up on it using textbooks, try to solve more problem sets, or seek the help of your instructor; please use the available options accordingly.

Course Website

Desire2Learn (D2L): D2L.uwm.edu. For information on how to use and access D2L, please consult uwmltc.org/?p=870. Problem sets and solutions as well as other course material will be made available on D2L. Visit the course website regularly as important information and announcements may be posted there as well.

Problem Sets

There will be a few homework assignments at irregular intervals. You are required to turn them in by the due date, although they will not be corrected and no grade will be given. Working on these problem sets will help you in preparing for the midterm and final exam; solutions to the homework assignments will be provided on the course website. In addition, you are strongly encouraged to work on your own on more problems from kinetics textbooks.
Grading
The course will be graded as follows based on examinations and a research project:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm (take-home)</td>
<td>35%</td>
</tr>
<tr>
<td>Final Exam (in-class)</td>
<td>45%</td>
</tr>
<tr>
<td>Research Project</td>
<td>20%</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

The *Midterm* is a take-home exam and will be handed out and posted to D2L after the lecture. The midterm will cover all topics discussed in class and problem sets in a format similar to the problem sets. No class will be held on Tuesday during midterm week. **No time extensions or make-up exam will be given for the take-home midterm.** If you are unable to turn it in during class, you may upload it to the D2L dropbox.

The *Final Exam* is comprehensive. Only a calculator (programmable or non-programmable) and a single sheet of paper with handwritten notes (recto-verso) are allowed. No books or other material are admitted.

In addition, you will choose one kinetics-related *Research Project* to work on during the second part of the semester. You will present the results from this project to the other students in a form announced by the instructor (either as an oral presentation or poster) during the last week of class. The quality of this presentation will count 20% towards the final grade.

**Tentative Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sep 2 - Sep 5</td>
</tr>
<tr>
<td>2</td>
<td>Sep 8 - Sep 12</td>
</tr>
<tr>
<td>3</td>
<td>Sep 15 - Sep 19</td>
</tr>
<tr>
<td>4</td>
<td>Sep 22 - Sep 26</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sep 29</td>
</tr>
<tr>
<td>5</td>
<td>Sep 29 - Oct 3</td>
</tr>
<tr>
<td>6</td>
<td>Oct 6 - Oct 10</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Oct 13 - Oct 17</td>
</tr>
</tbody>
</table>
### Week 8
- **Oct 20 - Oct 24**: Laplace Transform Method
- **Oct 24**: Last day to drop or withdraw from full-term courses

### Week 9
- **Oct 27 - Oct 31**: Matrix Algebra; Numerical Methods

### Week 10
- **Nov 3 - Nov 7**: Stochastic Approach

### Week 11
- **Nov 6 - Nov 14**: Midterm (take-home) - no class on Tuesday, Nov 11
- Catalysis

### Week 12
- **Nov 17 - Nov 21**: Enzyme Kinetics

### Week 13
- **Nov 24 - Nov 25**: Autocatalysis; Potential Energy Surfaces

### Week 14
- **Nov 26 - Nov 30**: Thanksgiving Recess

### Week 15
- **Dec 1 - Dec 5**: Transition State Theory
- **Dec 8 - Dec 11**: Research Project Presentation
- **Dec 15**: Final Exam

---

**Policies**

If you will need accommodations in order to meet any of the requirements of this course, please contact me and the Student Accessibility Center (SAC) as soon as possible. Special accommodations for students with disabilities can be provided, but their timely implementation can only be insured if the SAC is contacted ahead of time. For details see [www4.uwm.edu/sac/SACltr.pdf](http://www4.uwm.edu/sac/SACltr.pdf).

Department of Chemistry and Biochemistry policies are posted on bulletin boards in the department.

UWM policies related to students with disabilities, religious observances, students called to active military duty, incompletes, discriminatory conduct, academic misconduct, complaint procedures, grade appeal procedures, and final examination requirements can be consulted at [www.uwm.edu/Dept/SecU/SyllabusLinks.pdf](http://www.uwm.edu/Dept/SecU/SyllabusLinks.pdf).

**Academic Misconduct**

Cheating on an exam or other graded material will automatically result in a grade of zero (as a minimum consequence); failure in the course and referral to the Dean may also occur. Academic dishonesty in any form will not be tolerated.

“Academic misconduct is an act in which a student seeks to claim credit for the work or efforts of another without authorization or citation, uses unauthorized materials or
fabricated data in any academic exercise, forges or falsifies academic documents or records, intentionally impedes or damages the academic work of others, engages in conduct aimed at making false representation of a student's academic performance, or assists other students in any of these acts.”

“Prohibited conduct includes cheating on an examination; collaborating with others in work to be presented, contrary to the stated rules of the course; submitting a paper or assignment as one's own work when a part or all of the paper or assignment is the work of another; submitting a paper or assignment that contains ideas or research of others without appropriately identifying the sources of those ideas; stealing examinations or course materials; submitting, if contrary to the rules of a course, work previously presented in another course; tampering with the laboratory experiment or computer program of another student; knowingly and intentionally assisting another student in any of the above, including assistance in an arrangement whereby any work, classroom performance, examination or other activity is submitted or performed by a person other than the student under whose name the work is submitted or performed.”

(From: Office of the Provost and Vice Chancellor)