Chemical and Enzyme Kinetics, Chem 5353/5361

Instructor: Dr. Challa V. Kumar, x3213; Challa.Kumar@uconn.edu

Class Times: By arrangement
Recommended book: Physical Chemistry by Castellan

Course Goal, Scope, Content and Schedule

Goal: Provide intense training in reaction kinetics and catalysis

Scope: Both experimental and theoretical aspects of kinetics will be introduced. Thermal reactions as well as photochemical reactions will be examined. Stead-state as well as time-resolved studies will be discussed. Enzyme catalysis as well as chemical catalysis will be elaborated. Models of enzyme-substrate and receptor-ligand binding will be discussed.

Content: There are 12 major topics in the course. They are:
1. Kinetic theory of gases, collision cross-sections
2. Transport and diffusion
3. Definition of terms and vocabulary of chemical kinetics
4. Rate laws and rate equations
5. Temperature dependence of reaction rates
6. Photochemical kinetics
7. Steady-state methods
8. Enzyme kinetics
9. Time-resolved (Fluorescence, SPR, T-Jump and Stopped-Flow) methods
10. Ligand-receptor binding models
11. Enzyme adsorption to solid surfaces
12. Theories of Reaction Rates

End of course

Writing Component (3, 10%)
Three major assignments of 10% grade, each.

Oral Component (3, 10%)
Three oral presentations are scheduled with 10% grade, each.

Mid terms (3, 10%)
Three mid-term examinations at the end of September, October and November will be given. Each will have 10% grade.

Final (10%)
The final examination is optional (10%). It can be one of the best mid term exams or a final exam depending on the student choice. If chosen, the final exam is on Dec 7, 2012.
**Deadlines**
All deadlines are final and can not be moved. If you have any specific conflicts, we encourage you to submit the assignment in advance. Exceptions will be granted only with a valid doctor’s note explaining why the student can not meet the deadline due to health reasons.

**Religious Holidays and Course-conflicts**
On February 2, 2009, the University Senate passed a motion on about religious observances which stipulated that “Students anticipating such a conflict should inform their instructor in writing within the first three weeks of the semester, and prior to the anticipated absence, and should take the initiative to work out with the instructor a schedule for making up missed work.” For conflicts with final examinations, students should, as usual, contact the Office of Student Services and Advocacy (formerly the Dean of Students Office).

**Academic Code of Conduct**
Read and follow the University policy on proper academic conduct. Briefly, the Academic misconduct includes, but not limited to:

* Providing or receiving assistance on academic work (papers, projects, examinations) in a way that was not authorized by the instructor
* Any attempt to improperly influence (bribery, threats) any member of the faculty, staff, or administration of the University in any matter relating to academics or research
* Plagiarism
* Doing academic work for another student
* Presenting the same or substantially the same papers or projects in two or more courses without the explicit permission of the instructors
* Situations where one student knowingly assists another student in committing an act of academic misconduct, and any student doing so will be held equally accountable for the violation.