Syllabus - ENE 596 – Chemical Reactions In the Atmosphere

Prerequisites: Graduate Standing
Professor: Ronald C. Henry, KAP 224E, x-00596, rhenry@usc.edu
Office Hours: Tuesday and Thursday 2:00 – 3:00 PM and by appointment

Purpose: Graduate students in environmental engineering or chemical engineering interested in applied aspects of atmospheric chemistry should take this course. In it they will learn the basics of chemistry of the stratosphere, including ozone loss; and the chemistry of the troposphere, including formation of ozone by homogeneous gas phase reactions and formation of particulate sulfates and nitrates by reactions in water drops. Students will learn how to model atmospheric chemical reactions by solving systems of kinetic differential equations with Matlab.

Topics
1. The Atmosphere – Chapter 1
2. Chemical Kinetics – Chapter 3
3. Chemistry of the Stratosphere – Chapter 5
4. Chemistry of the Troposphere – Chapter 6
5. Dry Deposition – Chapter 19
6. Wet Deposition and Acid Precipitation – Chapter 16

Topics will not necessarily be covered in the order above, and are subject to change.

Grades
Grades will be determined by reports and projects. Reports could be a 5 page written review of a research paper, a 10 minute oral report to the class on a recent news story plus a 2 – 3 page written report, or solutions to some of the more challenging problems in the textbook. Students are encouraged to suggest creative projects of their own design.

Guidelines for Reports on Research Papers

General Principles
The main purpose is to communicate what you have learned from reading the paper. Use your own words; plagiarism will not be tolerated.

References to the paper under review should be in the form “one purpose of the paper is to find the rate of the reaction (page 259); another is to discuss the effect on the chemical mechanism (page 266).” You are encouraged to read related papers and to include these papers in your report. References to other papers must follow the same form as used in Atmospheric Environment. For example, “Henry and Chang (2000) shows that …” or “Other studies have shown the importance of human perception in visibility (Henry et al., 1999; Henry, 1995).” References must be given in alphabetical order by last name of the first author at the end of the paper using the format of Atmospheric Environment.

USE YOUR CLASS TIME
The report must be at least 1200 words, space and a half with the main body using Times Roman font or equivalent. Sans serif fonts (such as Arial) are not allowed, except as headings. Margins should be approximately one inch. Submit the reports as Word doc files to rhenry@usc.edu. Include a copy of the paper being reviewed.

Reports will be graded as follows:
- Content – 50 points
- Form (language, readability, and style) – 25 points
- Scholarship (Proper use of references, use of other sources) 25 points.

**Research Papers**
Your report should include but not necessarily be limited to the answers to the following questions:
- What was done?
- In light of previous work, why it is important?
- What were the results?
- What are the implications of the results?

**Review Papers**
Your report should include but not necessarily be limited to the answers to the following questions:
- Why is the subject of the review important?
- How is the review organized? What period of time does it cover?
- If you are limiting yourself to part of the review, which part? In what way is the subject of this part important?
- What significant insights into the subject does the reviewer present?

**Statement on Academic Integrity**
USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one’s own academic work from misuse by others as well as to avoid using another’s work as one’s own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: [http://www.usc.edu/dept/publications/SCAMPUS/gov/](http://www.usc.edu/dept/publications/SCAMPUS/gov/). Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: [http://www.usc.edu/student-affairs/SJACS/](http://www.usc.edu/student-affairs/SJACS/).

**Statement for Students with Disabilities**
Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

**USE YOUR CLASS TIME**