EVE 403
Atmospheric Chemistry
Spring Semester 2010
M, W, F
11:00 – 11:50
Room EGC 207

Instructor: André Butler, Associate Professor
Environmental and Mechanical Engineering

Office: Suite 105D, School of Engineering    Availability: By appointment
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Supplemental Texts:

Catalog Description:
An introduction to atmospheric chemical transformations; atomic structure and chemical bonding; thermodynamics, gas-phase kinetics, and photochemistry; tropospheric and stratospheric processes.

Course Objectives:
Upon successful completion of this course, students will be able to

1. Predict how/when elements will bond.
2. Use thermodynamic and/or kinetic information to determine the feasibility of atmospheric reactions.
3. Write chemical rate expressions and provide detailed analyses of reaction mechanisms.
4. Explain the major processes involved in stratospheric ozone depletion.
5. Explain the major processes involved in tropospheric ozone proliferation.
6. Catalog the major sources of atmospheric pollutants.
7. Explain major sink processes for atmospheric trace gases and aerosol species.
8. Describe horizontal and vertical transport of atmospheric pollutants.
9. Discuss and critique atmospheric chemistry research papers.

Outcomes will be measured and assessed by grades earned for homework, exams, research paper critiques and discussion. In addition, primary instructor evaluation and student feedback on the perceived quality of the course will be used to make future improvements.

Course Website: http://faculty.mercer.edu/butler_aj/eve403.htm
Visit often for course updates.

Prerequisites (and/or corequisites):
EVE 402, Air Pollution Generation and Control
Course Content:

1. Introduction/review (~3-4 weeks)
   a. Atomic structure
   b. Chemical bonding
   c. Nomenclature
   d. Chemical reactions (thermochemistry)
2. Gas-phase kinetics and photochemistry (~2-3 weeks)
3. Stratospheric chemistry (~2-3 weeks)
4. Tropospheric chemistry (~3-4 weeks)

Grading:

The final grade will be determined as follows:

Homework/Critiques 10%
Exam#1 30%
Exam#2 30%
Final Exam 30% Thursday, 5/6/2010 (9:00 – 12 noon)

Homework:

Homework is an important component of the class and will be distributed regularly. Collaboration is acceptable, but each student must submit an individual assignment. Late homework assignments will not be graded.

Critiques:

Research articles focusing on various aspects of atmospheric chemistry will be distributed up to four times throughout the term. Each student will be required to submit a 600-word critique of the article, adhering to a specific format that will be discussed.

Class Participation:

Students are expected to attend class and actively participate during discussions.

Class Standards

1. Please turn off cell phones and pagers before entering the classroom.
2. The honor code provisions as outlined in the Bulletin and in the student handbook, The Lair, will be assumed for everyone. Plagiarism is a violation of the honor code and is prohibited.
3. This syllabus is subject to change.

Student Support Services Policy:

Students requiring accommodations for a disability should inform the instructor at the close of the first class meeting or as soon as possible. If you are not registered with Disability Services, the instructor will refer you to the Disability Support Services office for consultation regarding documentation of your disability and eligibility for accommodations under the ADA/504. In order to receive accommodations, eligible students must provide each instructor with a “Faculty Accommodation Form” from Disability Services. Students must return the completed and signed form to the Disability Services Coordinator on the 3rd floor of the Connell Student Center. Students with a documented disability who do not wish to use academic accommodations are also strongly encouraged to register with Disability Services and complete a Faculty Accommodation Form each semester. For further information, please contact Carole Burrowbridge, Disability Services Coordinator, at 301-2778 or visit the website at http://www.mercer.edu/stu_support/swd.htm