Aqueous and Environmental Geochemistry, Spring 2013

Course Id: CHEM 609/GEOS 633 (3 cr.)
Lecture: MW 9:15 – 10:45 (REIC 165)
Instructor: Tom Trainor
Rm 176 REIC
474-5628
tpptrainor@alaska.edu
Office Hours: MW 1:00-3:00
Grading: 30% Problem Sets
35% Class participation and in-class presentations
35% Final project

Course Description
This course is focused on topics related to the chemistry of aquatic and soil/sediment environments and the interactions between aqueous solutions and geomedia. Particular emphasis is placed on heterogeneous interactions, including dissolution/precipitation and sorption processes involved in the partitioning, transformation and transport of metal(loid) species in the environment.

Student Learning Outcomes
The goal is to provide students with the conceptual background required for critical review and interpretation of the current aqueous and environmental geochemistry literature. This will be developed through lectures, problem sets, class discussions and individual student projects.

Topics
- Natural waters: classification and general controls on composition
- Environmental solids: structure, composition and crystal chemistry
- Weathering reactions: reaction pathways and thermodynamics controls
- Mineral surfaces: sorption, surface and colloid chemistry, mineral growth and dissolution
- Student directed topics: see below

Web pages
Course information will be posted on the Chem 609 Blackboard page. Please contact the instructor if you have any difficulty with access.
Text
D. Langmuir, Aqueous Environmental Geochemistry, Prentice Hall

Additional Sources
D.C. Adriano, Trace Elements in Terrestrial Environments, Springer
G. Sposito, The Chemistry of Soils, Oxford University Press
M McBride, Environmental Chemistry of Soils, Oxford University Press
F. Morel and J. Hering, Principles and Applications of Aquatic Chemistry, Wiley-Interscience
C. Bethke, Geochemical Reaction Modeling, Oxford University Press
R. Hunter, Foundations of Colloid Science, Oxford Science Publishers
H.L. Ehrlich, Geomicrobiology, Marcel Deckker

Important Dates:
Jan 25 Last day to add; last day for 100% refund tuition & fees
Feb 1 Last day for student-initiated and faculty-initiated drops
March 11-15 Spring Break
March 22 Last day for student-initiated and faculty-initiated withdrawals “W”
April 26 SpringFest (no classes)
May 6 Last day of classes
May 7-10 Final Exams

Computer Lab:
Your enrollment in this course gives you user privileges in the Department's computer lab.
Information and policies are available at: http://www.uaf.edu/chem/instrumentation/policies/.

Student with Documented Disabilities:
Student with a physical or learning disability, who may need academic accommodations, should
contact the Disability Services office (203 WHIT, 474-7043). Disability Services will then notify
the instructor of special arrangements for course work.

Ethical Considerations:
The Chemistry Department Policy on Cheating is: “Any student caught cheating will be assigned
a course grade of F. The student will not be allowed to drop the course.”
The UAF Honor Code states: “Student will not collaborate on any quizzes, in-class exams, or
take-home exams that will contribute to their grade in a course, unless permission is granted by
the instructor of the course. Only those materials permitted by the instructor may be used to
assist in quizzes and examinations. Student will not represent the work of others as their own. A
student will attribute the source of information not original with himself or herself (direct quotes
or paraphrase) in compositions, these and other reports. No work submitted for one course may
be submitted for credit in another course without the explicit approval of both instructors.
Violations of the Honor Code will result in a failing grade for the assignment and, ordinarily, for
the course in which the violation occurred. Moreover, violation of the Honor Code may result in
suspension or expulsion.”

Students may collaborate on homework assignments, however, each individual should submit
their own copy showing all their work. Projects are to be completed independently.