Environmental Aquatic Chemistry (Chem 413)
The chemistry of natural waters

M/W  5:30-7:17 PM

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Office 289 SEB - hrs: “open door” when I’m here; or by appointment.
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Prerequisites: CHM 158.  CHM 234 recommended
Requirements: computer for homework assignments: software will be provided (free)

Grading Options: Grades will be calculated three different ways and your highest score applies:
(1) Three quizzes, each 15% of the grade + 1 Final for 35% of grade, Homework = 20%
(2) Drop lowest one of the three quizzes (or if you skip taking one) – Each of two quizzes for 20% + Final for 40% of the grade, homework = 20%
(3) Drop the Final and each quiz is worth 25%, homework = 25%

Topics:
For Quiz 1
Thermodynamic principles, activity coefficients
Mass balance equations
Equilibrium calculations
Intro to acid/base chemistry

For Quiz 2
Carbonate chemistry - focus on MINEQL software
Dissolution

For Quiz 3
Complexation
precipitation
redox reactions
adsorption/equilibrium isotherms

Final Exam: April 23.  7-10 PM.

Important Semester Dates

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<tr>
<th>Date</th>
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<tr>
<td>January 15</td>
<td>MARTIN LUTHER KING, JR. DAY (CLASSES NOT IN SESSION)</td>
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<tr>
<td>February 24</td>
<td>WINTER RECESS BEGINS 10:00 PM</td>
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<td>March 5</td>
<td>CLASSES RESUME 7:30 AM</td>
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Expectations:
(1) Develop a general knowledge of the field (dissolution, complexation, and precipitation of inorganic constituents in the environment; redox reactions; acid/base titrations; sorption processes of organic and inorganic chemicals in the environment)
(2) Be able to do practical calculations (algebra and basic calculus)
(3) Be able to work with simple computer models
(4) Be able to read and understand current journal articles in the field

Policy on Academic Misconduct
The University's regulations that relate to academic misconduct will be fully enforced. Any student suspected of cheating will be referred to the Academic Conduct Committee. Students found guilty of academic misconduct face suspension or permanent dismissal.

Suggested Reference Books: (and my personal opinions)

Pankow, J. "Aquatic Chemistry Concepts". Lewis Publisher. (Boring, but cheap).

Stumm and Morgan, "Aquatic Chemistry". Wiley publisher. (As good as any).

Snoeyink and Jenkins "Water Chemistry" (good, but expensive)

Morel and Hering "Principles and Applications of Aquatic Chemistry". Wiley publisher. (Calculates things differently – uses different approach that is well liked by engineers, not chemists)

Websites: use the web to search for subject materials. Suggestions will be shared in class.