

Syllabus and Course Outline (Spring, 2010)
Geo 376T: High-Temperature Geochemistry (UID: 27035)

Meeting time: MWF 10:00-11:00 am, JGB 3.116
Instructor: Prof. John Lassiter
e-mail: lassiter1@mail.utexas.edu
phone: 1-4002
office: JGB 4.138
office hours: Wed. 1:00-3:00 pm or by appointment

Required texts:

Bill White's on-line Geochemistry textbook at
<http://www.geo.cornell.edu/geology/classes/geo455/Chapters.HTML>

Lecture notes and other class material will be posted on Blackboard.

Potentially Useful Supplemental Reading:

Principles and Applications of Geochemistry, Gunther Faure

Geochemistry: An Introduction, Francis Albarede

Supplemental reading will be placed on reserve in the Geosciences library

Course description: This course will provide an in-depth introduction to modern geochemical methods, with particular emphasis placed on the utilization of geochemistry in the study of “hard rock” geologic processes. Students will learn how geoscientists utilize trace elements, radiogenic and stable isotopes to examine and constrain geologic processes. We will examine the chemical behavior of different classes of elements and how elemental abundances and ratios in geologic materials can be used to examine processes such as melt generation, fluid transport at subduction zones, and even the large-scale differentiation of the Earth into crust, mantle, and core. We will also explore the mechanisms responsible for stable isotope fractionation, and how stable isotope variations can be used to explore processes ranging from the waxing and waning of the ice caps to hydrothermal ore formation and the nature and origin of mantle plumes. Finally, we will examine radioactive decay and naturally occurring radioactive decay systems, and the use of radioisotopes in geochronology, tectonics, and other areas of the Earth Sciences. The course will also provide an introduction to modern analytical methods and the analytical instrumentation housed in the Dept. of Geological Sciences at UT. Throughout the course, the interconnections between geochemistry and other subfields in the geological sciences, including geophysics, petrology, and tectonics, will be explored.

Course Credit: Student grades will be based on the following:

Homework Assignments	30%
Midterm Exam	20%
Presentation/Paper	20%
Final Exam	30%

In addition to completing homework assignments and exams, students will write a 5-8 page paper on a research topic of their choice, examining a particular problem in the geologic sciences in depth and discussing how geochemical investigations have been utilized to examine this problem. Students will present the results of their literature investigation in a ~20 minute class presentation.

Students with Special Needs: Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259.

The University Honor Code: “The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.”

Students are expected to read and to strictly adhere to the University’s written policies on academic dishonesty. Cheating or plagiarism will result in a zero for the exam or assignment in question, and students caught violating University policy will be referred to the Dean of Student Affairs for disciplinary action.

For homework assignments, students are encouraged to communicate and exchange ideas, but all submitted work must be your own.