Geol. 656 Isotope Geochemistry
Syllabus  Spring 2000

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255-7466; white@geology.cornell.edu
Office Hours: TBA

Text:  WMW Lecture Note

Grades:  
30% Prelim
40% Final
30% Problems Sets (there will be 6 to 8)

Information on the course and lecture notes are posted on the World Wide Web at:
http://www.geo.cornell.edu/geology/classes/geo656/656home.html

Part I: Radioactive and Radiogenic Isotope Geochemistry
A. Physical Fundamentals
   1  Introduction, Physics of the Nucleus           Jan 24
   2  Physics of the Nucleus, Radioactive Decay    Jan 26
   3  Nucleosynthesis and the Origin of the Elements Jan 28
B.  Geochronology
   4  Equations of Radioactive Decay and Radiogenic Growth Jan 31
   5  Geochronology I: The K-Ar System              Feb 2
   6  Geochronology II: The Rb-Sr System            Feb 4
   7  Geochronology III: Sm-Nd                      Feb 7
   8  Geochronology IV: U-Th-Pb                    Feb 9
   9  U-Th-Pb continued                             Feb 11
  10  Short-lived Isotopes of the U-Th Decay Series Feb 14
  11  Lu-Hf, Re-Os & Other Decay Systems           Feb 16
  12  Geochronology VI: Cosmogenic Isotopes (\(^{14}C, ^{36}Cl, ^{10}Be\), etc.) Feb 18
  13  Cosmogenic Isotopes, continued               Feb 21
  14  Geochronology VII: Fission Track Dating       Feb 23
  15  Analytical Methods                             Feb 25
C:  Radiogenic Isotope Geochemistry
  16  Isotope Geochemistry of the Earth’s Mantle I  Feb 28
  17  Sr Isotope Chronostratigraphy & Seawater Geochemistry Mar 1
  18  Isotope Geochemistry of the Earth’s Mantle II Mar 3
  19  Mantle and Whole Earth Geochemical Models     Mar 6
  20  Evolution of the Mantle and Crust             Mar 8
  21  Evolution of the Continental Crust            Mar 10
  22  Evolution of the Continental Crust II         Mar 12
  23  Magma Sources in Subduction Zones             Mar 15
      PRELIM EXAM                                      Mar 17
      SPRING BREAK                                    Mar 17
  24  Cosmochemistry and Cosmochronology            Mar 27
  25  Cosmochemistry and Cosmochronology II         Mar 29
  26  Evolution of the Atmosphere                   Mar 31

Part II: Stable Isotope Geochemistry
A: Fundamentals
   27  Physical Fundamentals I                      Apr 3
   28  Physical Fundamentals II                     Apr 5
   29  Geothermometry and Isotopes in the Hydrosphere and Atmosphere Apr 7
   30  Isotope fractionation in the Biosphere       Apr 10
B: Igneous and Hydrothermal Systems
   31  Stable Isotopes in Igneous Systems I: Indicators of Assimilation Apr 12
   32  Stable Isotopes in Igneous Systems II: Crustal Recycling Apr 14
   33  Hydrothermal Systems and Ore Genesis         Apr 17
   34  Hydrothermal Systems and Ore Genesis II      Apr 19
C: Low Temperature Applications
   35  Applications to Archeology and Paleontology Apr 21
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<td>Evolutionary Models of the Biosphere, Hydrosphere, and Atmosphere</td>
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<td>Catch-up and Review</td>
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Final Exam: Friday May 12, 3:00-5:30