

Location: Vaughan Hall, Rm. 100

Time: Tuesday-Thursday: 2:00 - 3:20 p.m.

Instructors: Pat Castillo (3131 Sverdrup Hall, pcastillo@ucsd.edu)
 Jeff Severinghaus (211 Vaughan Hall, jseveringhaus@ucsd.edu)
 Emily Chin (3165, Sverdrup Hall, e8chin@ucsd.edu)

References*: on reserve in Rm 10, Old Scripps Building
 (Also, see notes of individual instructors)

Grading (Letter grade):

15% Homework
 25% Midterm
 60% Final Exam

Tentative class schedule:

07 Jan	PC	Intro to isotope geology, nucleosynthesis, radioactive decay and growth
09 Jan	EC	Trace element geochemistry, mass spectrometry
14 Jan	EC	Radiogenic isotope geochemistry, Rb-Sr isotope systematics
16 Jan	PC	Sm-Nd isotope systematics; two-component mixtures
21 Jan	PC	Pb isotope systematics
23 Jan	PC	Lu-Hf & Re-Os isotope systematics
28 Jan	PC	Mantle geodynamics I; the Sr-Nd-Pb isotopes of the mantle
30 Jan	PC	Mantle geodynamics II; the origin of mantle end-members
4 Feb	PC	Mantle geodynamics III; Pb and Hf paradoxes
6 Feb	PC	K-Ar and $^{40}\text{Ar}/^{39}\text{Ar}$ methods of dating, extinct radionuclides
11 Feb	PC	Mid-term
13 Feb	JS	Noble gases as tracers in the solid earth, ocean, and atmosphere
18 Feb	JS	Cosmogenic isotopes I – Surface exposure dating, ^{10}Be and ^{36}Cl
20 Feb	JS	Cosmogenic isotopes II – Carbon-14 as tracer and clock
25 Feb	JS	Principles of isotope fractionation and water isotopes
27 Feb	JS	Oxygen isotopic composition of carbonate shells/paleothermometry
3 March	JS	Carbon isotopes; photosynthetic fractionation; major reservoirs
5 March	JS	Carbon isotopes; applications
10 March	JS	Nitrogen Isotopes
12 March	JS	Sulfur Isotopes

Final exam: Thursday, 3:00 p.m. – 5:59 p.m., 19 March

*** References:**

Faure, Gunter. Principles of isotope geology, Wiley, c1986
QE501.4.N9 F38 2005

Allègre, Claude J., Isotope geology, Cambridge University Press, 2008
QE501.4.N9 A45 2008

Dickin, Alan P., Radiogenic isotope geology, Cambridge University Press, 2005
QE501.4.N9 D53 2005

H.-G. Attendorn and R.N.C. Bowen, Radioactive and Stable Isotope Geology, Chapman & Hall
QE501.4.N9 A895 1997

Robert Bowen, Isotopes in the earth sciences
QE501.4.N9 B69 1988

Zach Sharp, Principles of Stable Isotope Geochemistry, 2nd Edition.
Available as free download at http://digitalrepository.unm.edu/unm_oer/1/