

Location: Vaughan Hall, Rm. No. 100

Time: Tuesday-Thursday: 12:30 - 1:50 p.m.

Instructors: Pat Castillo (3131 Sverdrup Hall, pcastillo@ucsd.edu)

Jeff Severinghaus (211 Vaughan Hall, jseveringhaus@ucsd.edu)

References*: (on reserve in Rm 10, Old Scripps Building):

Also, see notes of individual instructors

Grading (Letter grade):

30% Homework

30% Midterm

40% Final Exam

Tentative class schedule:

7 Jan	PC	Nucleosynthesis, radioactive decay and growth
9 Jan	PC	Trace element geochemistry, mass spectrometry
14 Jan	PC	Radiogenic isotope geochemistry, Rb-Sr isotope systematics
16 Jan	PC	Two-component mixtures
21 Jan	PC	Sm-Nd isotope systematics
23 Jan	PC	Pb isotope systematics
28 Jan	JS	K-Ar and $^{40}\text{Ar}/^{39}\text{Ar}$ methods of dating
30 Jan	JS	Cosmogenic isotopes I – Surface exposure dating, ^{10}Be and ^{36}Cl
4 Feb	JS	Cosmogenic isotopes II – Carbon-14 as tracer and clock
6 Feb	PC	Lu-Hf & Re-Os isotope systematics
11 Feb	JS	Noble gases as tracers in the solid earth, ocean, and atmosphere
13 Feb		Mid-term
18 Feb	JS	Principles of isotope fractionation and water isotopes
20 Feb	JS	Oxygen isotopic composition of carbonate shells/paleothermometry
25 Feb	PC	The Sr-Nd-Pb-He isotopic signature of oceanic rocks
27 Feb	PC	Isotope geology and mantle geodynamics
4 March	JS	Carbon isotopes; photosynthetic fractionation; major reservoirs
6 March	JS	Carbon isotopes; applications
11 March	JS	Nitrogen Isotopes; Sulfur Isotopes
13 March	JS/PC	Course wrap up/review

Final exam: Tuesday, 11:30 a.m. – 2:29 p.m., 18 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