

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:

6 Jan	PC	Intro to isotope geology, nucleosynthesis, radioactive decay and growth
8 Jan	PC	Trace element geochemistry, mass spectrometry
13 Jan	PC	Rb-Sr isotope systematics
15 Jan	PC	Sm-Nd isotope systematics; Two-component mixtures
20 Jan	PC	More on two-component mixtures
22 Jan	PC	Pb isotope systematics
27 Jan	PC	Pb paradoxes
29 Jan	PC	The Sr-Nd-Pb-He isotopes of oceanic rocks and mantle geodynamics
3 Feb	PC	Lu-Hf & Re-Os isotope systematics
5 Feb	PC	Midterm exam
10 Feb	JS	Noble gases as tracers in the solid earth, ocean, and atmosphere
12 Feb	JS	Cosmogenic isotopes I – Surface exposure dating, ^{10}Be and ^{36}Cl
17 Feb	JS	Cosmogenic isotopes II – Carbon-14 as tracer and clock
19 Feb	JS	Principles of isotope fractionation and water isotopes
24 Feb	JS	Oxygen isotopic composition of carbonate shells/paleothermometry
26 Feb	JS	Carbon isotopes; photosynthetic fractionation; major reservoirs
3 March	JS	Carbon isotopes; applications
5 March	JS	Nitrogen Isotopes
10 March	JS	Sulfur Isotopes
12 March	JS/PC	Course wrap-up; review

Final exam: Tuesday, 11:30 a.m. – 2:29 p.m., 17 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