

**Location:** Vaughan Hall, Rm. No. 100

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

**Instructors:** Pat Castillo (3131 Sverdrup Hall, [pcastillo@ucsd.edu](mailto:pcastillo@ucsd.edu))

Jeff Severinghaus (211 Vaughan Hall, [jseveringhaus@ucsd.edu](mailto: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:**

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

**Final exam:** Tuesday, 11:30 a.m. – 2:29 p.m., 15 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