Course goals:

1.Understand the fundamental principles of isotope geo- and cosmochemistry.

2.Apply this to understanding the origin, composition, and evolution of the Earth, other planets and the origins of solar systems.

3.Use the principles to understand geological processes and age determinations.

4.Understand the fundamentals of isotope measurements by mass spectrometry and how to calculate final results from raw data.

5.Understand how this knowledge can be used to address a range of problems in isotope geology and geochemistry.

6.How to use basic software like Microsoft Excel to solve problems in the fields of isotope geo- and cosmochemistry.

7.Understand how to use the scientific literature in isotope geo- and cosmochemistry.

Course format:

Lectures, discussions, lab meetings, problem sessions. Problem sets and labs cover:

1.Mass spectrometry, calculations of parameters and basic systematics

2.Fractionation corrections, high precision measurements

3.Spiking, isochron calculations

4.Double spike procedures

5.Sm-Nd, Lu-Hf, Rb-Sr and U-Th-Pb: basic calculations and measurements

6.Isotope systematics in mixtures

7.Planetary evolution calculations and modeling

Lab meeting time

To be determined

Assignments and grading:

Grading:

Laboratory exercises and Problem sets (70%)

Final paper and presentation (30%)

Reading list:

REQUIRED TEXT**:** Lecture notes, laboratory notes, problem sets

TEXTS RECOMMENDED FOR SUPPLEMENTAL READING**:**

(1) H.Y. McSween and G. R. Huss: *Cosmochemistry*, Cambridge University Press, 2010, ISBN 978-0-521-87862-3

(2) Alan Dickin: *Radiogenic Isotope Geology (3rd edition)*, Cambridge University Press, 2005, ISBN 0-521-53017 2

(3) G. Faure and T. M. Mensing: *Isotopes: Principles and Applications (3rd edition)*, John Wiley & Sons, 2005, ISBN 0-471-38437-2

Students are not permitted to disrupt classes, nor are instructors and TFs permitted to cancel classes for political reasons.

- Any disruption will be subject to disciplinary action.
- Have HUPDâ€™s number on your phone: (617) 495-1212. You can call them if you become concerned about physical safety.
- Absence due to participation in protests is not allowed.