Fred J Longstaffe
November 23, 2016

Geology 9556 – Winter 2017

Course Title:

Advanced Stable Isotope Science I: Low Temperature Earth Systems

Description:
Each year we tune the content of this course to the special interests of the students enrolled. The emphasis in any particular year is determined once we know the class membership. The general direction we take is decribed below.

Examination of paleo-ecosystem reconstruction methods and water-rock interaction based on the stable isotope behaviour of elements within the atmosphere, biosphere, hydrosphere, and lithosphere. Topics may include: atmospheric gases, fresh and marine water, soil and sediments, biomineralization, food webs, stable isotope proxies for climate, environments, diet and migration, hydrothermal systems, marine systems. Applications may include (but are not restricted to) bioarchaeology, geology, ecology, environmental science, hydrology, limnology, mineral deposits, paleoclimatology, paleontology and zooarchaeology.

The course material is delivered through a combination of lectures, discussions, student mini-lectures, and assignments.

Prerequisites:

Earth Sciences 4431a or Geology 9506a or permission of instructor

Weight:

0.5 credits

Instructor:

Fred Longstaffe: B&G 1023, email: flongsta@uwo.ca

Graduate Teaching Associate:

tba

Location: tba

Tentative Time: **If all can make it, we will meet on *Thursdays, 09:30 am to noon*
**** Once we know who is enrolled, we will tune this time to fit all schedules**

~Eleven (11) sessions (see schedule on next page)

Tentative Schedule for 2017:

Session 1 – Thursday, January 12, 2017, 09:30 – 12:00 noon
Session 2 – Thursday, January 19, 2017, 09:30 – 12:00 noon
Literature discussion
Assignment #1 posted (due February 9, 2017)
Session 3 – Thursday, January 26, 2017, 09:30 – 12:00 noon
Session 4 – Thursday, February 2, 2017, 09:30 – 12:00 noon
Literature Discussion
Student mini-lecture
Session 5 – Thursday, February 9, 2017, 09:30 – 12:00 noon
student mini-lecture
Session 6 – Thursday, February 16, 2017, 09:30 – 12:00 noon
Literature Discussion
Assignment #2 posted (due March 16, 2017)
Session 7 – Thursday, March 2, 2017, 09:30 – 12:00 noon
Student mini-lecture
Session 8 – Thursday, March 9, 2017, 09:30 – 12:00 noon
Literature Discussion
Session 9 – Thursday, March 16, 2017, 09:30 – 12:00 noon
Student mini-lecture
Assignment #3 posted (due April 6, 2017)
Session 10 – Thursday, March 30, 2017, 09:30 – 12:00 noon
Literature Discussion
Session 11 – Thursday, April 6, 2017, 09:30 – 12:00 noon
Literature Discussion
Student mini-lecture

Take-home examination – distributed Thursday, April 6, 2017;
Due Thursday, April 27, 2017 by 16:30
Submit by e-mail to F.J. Longstaffe flongsta@uwo.ca

Mini-lectures: Each student will be assigned a 30-minute mini-lecture.

Discussions: About every other week, the strengths and weaknesses of one to three published papers will be discussed (~20 minutes) by the group in terms of the papers' strengths and weaknesses. Lead discussant will be appointed at the start of each discussion.

Field Trip: TBA (one-day local excursion) – optionally.

Grading:
Assignments (3 in total): 45% (15% each)
Mini-lecture: 15%
Participation: 10%
Final examination (take home): 30%

Reference Texts:

The following texts may be useful (none specifically required):

Clark, I. And Fritz, P. (1997) Environmental Isotopes in Hydrogeology. Lewis Publishers, 328 p.
Faure G. and Mensing T.M. (2005) Isotopes: Principles and Applications. John Wiley and Sons Inc., 897 p.
Fry, B. (2006) Stable Isotope Ecology. Springer, 308 p.
Griffiths, H. Ed. (1998) Stable Isotopes – Integration of Biological, Ecological and Geochemical Processes. BIOS Scientific Publishers, Ltd., 438 p.
Hoefs, J. (2004) Stable Isotope Geochemistry. Fifth Edition. Springer, 239 p.
Kendall, C. and McDonnell, Eds. (1998) Isotope Tracers in Catchment Hydrology. Elsevier, 839 p.
Michener, R. and Lajtha, K., Eds. (2007) Stable Isotopes in Ecology and Environmental Science – 2nd Edition. Blackwell Publishing, 566 p.
Mook, W.G. (2006) Introduction to Isotope Hydrology – Stable and Radioactive Isotopes of Hydrogen, Oxygen and Carbon. Taylor & Francis Group, 226 p.
Ohkouchi, N., Tayasu, I. and Koba, K., eds. (2010) Earth, Life, and Isotopes. Kyoto University Press, 415 p.
Sharp, Z. (2007) Principles of Stable Isotope Geochemistry. Pearson Prentice Hall, 344 p.

University Statements:

Health and Wellness:

As part of a successful graduate student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western's Campus Recreation Centre. Numerous cultural events are offered throughout the year. For example, please check out the Faculty of Music web page http://www.music.uwo.ca/, and our own McIntosh Gallery http://www.mcintoshgallery.ca/. Information regarding health- and wellness-related services available to students may be found at http://www.health.uwo.ca/. Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Campus mental health resources may be found at http://www.health.uwo.ca/mental_health/resources.ht

Illness and Other Circumstances:

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see: http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf

A UWO Student Medical Certificate (SMC) is required where a student is seeking academic accommodation. This documentation should be obtained at the time of the initial consultation with the physician or walk-in clinic. An SMC can be downloaded under the

Medical Documentation heading of the following web site:
https://studentservices.uwo.ca/secure/index.cfm.

Accessibility:

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x.82147 for any specific question regarding an accommodation.

Scholastic Offences:

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_grad.pdf

Plagiarism: Plagiarism is a serious academic offence. The UWO Senate Academic Handbook defines plagiarism as "The act of appropriating the literary composition of another, or parts or passages of his writings, or the ideas or language of the same, and passing them off as the product of one's own mind." Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as citations. For more information see Scholastic Offence Policy in the Western Academic Calendar. Students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following web site: http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (http://www.turnitin.com).

Support Services:

Registrarial Services	http://www.registrar.uwo.ca/
Student Support Center:	http://www.sdc.uwo.ca/
Health & Wellness:	http://www.health.uwo.ca/.
Mental Health & Wellness:	http://www.health.uwo.ca/mental_health/resources.ht