Geophysics 9525B - Seismic Geology
Course Syllabus
Winter term 2017

Course Instructor: Dr. Sheri Molnar
Office: B&GS-1040; Office hours by appointment
Email: smolnar8[at]uwo.ca; Always use your Western email address to contact your instructor.

COURSE DESCRIPTION: This course provides an advanced overview of earthquake site amplification and its characterization for mitigation planning and seismic design purposes. Students will assess earthquake site amplification from empirical earthquake recordings, numerical simulations, and evaluation of case studies worldwide. Various software programs will be used to extract site characterization information and model predictions of earthquake site amplification.

Prerequisite(s): Permission of the instructor. This course is intended for geology, geophysics, geotechnical and civil engineering graduate students, with no significant prior knowledge of the course content. *(Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.)*

Course Workflow:
Two lecture and laboratory hours per week. One of the two weekly lecture periods will entail instructor lecturing. The second lecture will entail a more dynamic student engagement, e.g., presentations to a group or the class, discussions in pairs.
LECTURES: Tuesdays & Thursdays 11:30am – 12:20pm BGS 1084
LAB: Thursdays 12:30 – 2:20 pm BGS 0184

Recommended course reading material: There is no textbook. Published literature will come from the instructor as well as your own literature searches. The following publications and/or textbooks are recommended for additional reading and supplemental to the course content:

- Y. Bozorgnia and V. V. Bertero (eds.), 2004. Earthquake Engineering: From engineering seismology to performance-based engineering, CRC press.
- S. Kramer, 1996. Geotechnical Earthquake Engineering, *in* Civil Engineering and Engineering Mechanics, W. J. Hall (ed.), Prentice-Hall International Series.
- Hunter, J.A. and Crow, H.L. (ed.), 2012. Shear Wave Velocity Measurement Guidelines for Canadian Seismic Site Characterization in Soil and Rock; Geological Survey of Canada, Open File 7078, 227 p., doi:10.4095/291753
- S. Foti, C. G. Lai, G. Rix, and C. Strobbia, 2015. Surface wave methods for near-surface site characterization, CRC Press.

Summary of Lecture Topics (approximate and subject to change):

- Earthquake site amplification (empirical evidence, case studies, and theory)
- Importance of earthquake site amplification assessment and mapping
- Earthquake site classification in our building code
- Earthquake site characterization (*in situ* or field) techniques
- Numerical modelling of site amplification

Course Work

Group discussions will run weekly to bi-weekly depending on each topic's lecture content. There will be various formats for group discussion depending on subject material suitability and number of students. Students will be expected to read at least one assigned journal article (paper) prior to each group discussion and be able to provide a brief oral summary and/or answer questions. Students will also be expected to develop and ask questions based solely on reading the abstract or viewing a figure from any non-prior-assigned journal articles.

Assignments will consist of a series of tasks to achieve a particular aim or goal. Assignments will be assigned each week and may build upon the assignment from the week before. Assignment format submission will vary: oral presentation, media-based, or written report. All software will be open-source (installed on BGS 0184 computers and/or your own Windows OS machine) and basic instruction provided. Late submissions will be accepted with a 5% per day penalty. Under exceptional circumstances, late submissions will be accepted with no penalty, provided adequate documentation is given.

The project will involve the generation of a professional earthquake site classification assessment and accompanying written report for a potential client (e.g., geotechnical engineering firm, municipal planning agency). A brief oral presentation of the project will also be required.

Method of Evaluation (Subject to change):

Discussion Group: 30%
Includes presentation(s) and leading discussion(s), 25%; participation, 5%
Assignments: 40%
Project: 30%
Includes written report, 25%; oral presentation, 5%.

POLICY STATEMENTS:

Statement on Academic 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/scholoff.pdf

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. For further information please see:
http://www.uwo.ca/univsec/handbook/appeals/medical.pdf

A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found here:
https://studentservices.uwo.ca/secure/medical_document.pdf

Accessibility Statement: *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.

Support Services: *Learning-skills counsellors at the Student Development Centre are ready to help you improve your learning skills (http://www.sdc.uwo.ca). They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.*

Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, http://westernusc.ca/services.

The website for Registrarial Services is http://www.registrar.uwo.ca.