

CARLETON UNIVERSITY

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

GEOTECHNICAL EARTHQUAKE ENGINEERING • CIVE 5505 (CVG7109) • Fall 2013

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Instructor: Professor S. Sivathayalan (3450 ME; ☎ 613 520 2600 x5802)

*siva\_sivathayalan@carleton.ca*

Lectures: Thursday 1800-2100 (3174 ME)

### Topics

Introduction: Vibrations, Seismic hazards

Earthquakes/Ground Vibration

Earthquake: waves, sources, magnitudes,

Ground motion: measurement, parameters, estimation

Seismic hazard analysis: deterministic vs Probabilistic

Wave propagation

in elastic medium, attenuation

Soil properties for dynamic analyses

Laboratory tests, in-situ tests

Modulus, Damping characteristics, Modelling

Ground Response Analysis

Vibration: SDOF, MDOF systems

Linear, Non linear analysis; Layered soils

Local site conditions, Design ground motions

NBCC 2005: Geotechnical implications

Liquefaction of soils

Experimental studies, Field observations

Liquefaction susceptibility: factors affecting, evaluation of

Seed's chart, Post liquefaction response

Slope stability/Retaining structures: Seismic effects

Pseudostatic, Newmark Sliding block analysis

Yielding, Non-yielding, Basement walls, Mononobe & Okabe

Textbook:

Geotechnical Earthquake Engineering, Steve Kramer, Prentice Hall, 1996.

References/Background:

Earthquakes, BA Bolt, WH Freeman & Co. 2004.

Principles of Soil Dynamics, BM Das, Brookes/Cole, 1993.

Dynamics of Structures, Theory and Applications to Earthquake Engineering, AK Chopra, Prentice Hall, 2002,

Evaluation:

Assignments 40%

Final Exam 60%

Academic Accommodation

Students requiring special arrangements to meet the academic obligations during the term because of disability, pregnancy or religious obligations should write to me during the first two weeks of class, or as soon as the need for accommodation is known to exist.

Students with disabilities requiring academic accommodation in this course must register with the Paul Menton Centre for Students with Disabilities (PMC, ☎ 613 520 6608) for a formal evaluation of disability-related needs. Registered PMC students are required to contact the PMC every term to ensure that your Instructor receives your Letter of Accommodation, no later than two weeks before the first assignment is due or the first in-class test/midterm requiring accommodations. If you only require accommodations for your formally scheduled exam(s) in this course, please submit your request for accommodations to PMC by the last official day to withdraw from classes in each term.

Final Examination:

Final examination is for evaluation purposes only and students will not have access to their marked exam.

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**Course Information, Downloads**

<http://geotech.cee.carleton.ca/courses/cive5505/>

Authentication Credentials: TBA in class

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