PhD course: BA 8305 Geodynamics 2019

23rd to 26th September at NTNU, Trondheim,
28th to 31th October at NGI, Oslo

Offered by
Norwegian University of Science and Technology (NTNU) and
Norwegian Geotechnical Institute (NGI)

Lecturers: Professor Steven Kramer - UW, Seattle
Professor Amir M. Kaynia – NGI, Oslo / NTNU, Trondheim
Dr. Brian Carlton – NGI, Oslo
Dr. Arnkjell Løkke– NGI, Oslo
Professor Lars Vabbersgaard Andersen Aarhus University
Professor Steinar Nordal – NTNU, Trondheim
Professor Gudmund Eiksund – NTNU, Trondheim (Course organizer)

The course provides the necessary background for estimating the dynamic response of foundations and vibrations in soils. Course content: Basic theory for dynamic systems with one or many degrees of freedom. Wave propagation in elastic media. Vibration of footings and foundations on soils. Geotechnical earthquake engineering. Vibrations from traffic and construction activity. Parameters for soil dynamics determined by laboratory and field tests. Numerical simulations using the Finite element method. Soil structure interaction and non -linear dynamic analyses. The course is taught in English and is made up by intensive lecturing in combination with exercises. In addition compulsory homework is given for self-study and a written examination is offered in December. The exam may be organized at different cooperating universities in Europe to minimize travelling. Participants should have a M.Sc. degree in geotechnical or structural engineering to be accepted for the exam.

PROGRAM: The course is divided into three sequences of lectures and guided exercises:

Part 1: 23rd to 26th September:
Basics of dynamics for soils, by Steinar Nordal and Gudmund Eiksund,
Modelling of vibrations in layered soils by Lars Vabbersgaard Andersen

Part 2: 28th and 29th October:
Geotechnical earthquake engineering by Steven Kramer

Part 3: 30th and 31th October:
Design according to EU codes, Seismic hazard assessment, Slope stability assessment, Soil structure interaction by Amir M. Kaynia, Brian Carlton and Arnkjell Løkke

Credit hours: 10 ECTS, – i.e. 1/3 of a full semester. Exercises (as homework) are compulsory if you take the course for credit. ***Participants are welcome to join only parts of the course: Part 2, the seminar on Geotechnical earthquake engineering and/or Part 3, the seminar on Design according to EU codes, Seismic hazard assessment, Slope stability assessment, Soil structure interaction. These seminars are organized and offered as separate events.***

Recommended textbook: Steven Kramer: Geotechnical Earthquake Engineering, ISBN 0-13-374943-6, Prentice Hall 1996. Course notes or PowerPoint printouts from NGI/NTNU will be made available.

Cost: Registered PhD students participate for free but must pay NOK 1000 for course notes and coffee. For other participants the cost for the total course is NOK 7000, or NOK 3000 for part 1, NOK 2500 each for part 2 and 3, lunch included.*

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For registration: marit.skjak-brak@ntnu.no

Please register before 1 September for access to the examination to earn credits and a course certificate with a grade.

** Submit documentation for PhD student status at registration*