CE7S03: S3 – Wind and Earthquake Engineering [5 credits]

Module Co-ordinator(s): Prof. Brian Broderick (bbrodrck@tcd.ie)

Lecturer(s): Prof. Biswajit Basu

Module organisation
Department of Civil, Structural and Environmental Engineering

Module description, aims and contribution to programme
This module is suitable for students with a good undergraduate knowledge of structural engineering. It is intended as an introduction to the analysis and design of buildings under seismic and wind loading conditions and contains a review of the relevant principles and methods of structural analysis.

Learning outcomes
On successful completion of this course, students will be able to:
1. Describe the origin of seismic loads and their effect on building structures;
2. Calculate the response of a SDOF system to earthquake ground motion;
3. Calculate response spectra from earthquake ground motion records and wind loads;
4. Draw design spectra for linear and nonlinear structures;
5. Describe the main forms for earthquake resistant structures;
6. Apply the provisions of Eurocode 8 in structural design;
7. Design structures for wind load;

Module content
2. Engineering seismology and earthquake ground motion.
3. Earthquake response of SDOF systems: response and design spectra, linear and nonlinear response.
5. Relevant provisions of Eurocode 8.

Teaching strategies
Students will attend lectures and complete classroom-based tutorials. They will also independently complete larger pieces of coursework, including hand and computer-based calculations using the principles and methods introduced in class. Independent background reading and acquisition of web-based materials will also be required.
Student questionnaires will be employed to develop the course content and coursework activities.

**Assessment**
(a) Summative – Examination 70%; Coursework 30%.
(b) Formative – Classroom assessment of independent reading and learning.

**Required textbook**
Any textbook on structural dynamics. Clough and Penzien is recommended. Web resources to be identified in class.

**Further information**
School of Engineering weblink.