

Module Details	
Module Title:	Structural Dynamics & Earthquake Engineering
Module Code:	CSE7010-B
Academic Year:	2019-20
Credit Rating:	20
School:	Department of Civil and Structural Engineering
Subject Area:	Civil and Structural Engineering
FHEQ Level:	FHEQ Level 7 (Masters)
Pre-requisites:	
Co-requisites:	

Contact Hours	
Type	Hours
Lectures	30
Tutorials	12
Laboratory	6
Directed Study	152

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2 (Feb - May)

Module Aims
To study the concepts of structural dynamics and earthquake engineering and thereafter impart the key knowledge and skills required to design buildings to resist earthquakes. To develop the ability and skills to use laboratory equipment to measure the behaviour of simple and complex systems.

Outline Syllabus
Civil engineers are most accustomed to static loads. One of the most important lessons learned from earthquake damage surveys is the difference in structure failure patterns due to static loads and those due to cyclic (dynamic) loading. An important aspect of this module is to study

the behavior of structures under cycling loading and understand how to avoid common mechanisms of failure. Seismic waves and how to read seismographs. Single and multiple degree of freedom. Damping and vibration isolation. Response of structures to earthquake excitation. Soil structure interaction measurements using shake tables and liquefaction tank. Design of structures to resist earthquakes according to Eurocode 8. Critically evaluating the behavior of structures under earthquake loads using Sap2000.

Learning Outcomes

1	Critically evaluate structure failure patterns and risks due to static loads and those due to cyclic (dynamic) loading.
2	Show mastery of reading seismographs.
3	Apply knowledge of soil properties in designing structures to resist earthquake loads.
4	Design structures according to Eurocode 8 including health and safety.

Learning, Teaching and Assessment Strategy

Concepts are introduced using formal lectures. Deeper understanding is developed during problems classes, and further enhanced using the laboratory class. Oral feedback is given during the laboratory sessions and problems classes.

Technical report will assess the application of practical skills to the knowledge base of the module (2, 3, 4) and the formal examination will assess the wider learning outcomes expressed in the descriptor (1-4). The formative exam will provide students with feedback in order to improve their learning and understanding of the subjects.

Mode of Assessment

Type	Method	Description	Length	Weighting
Summative	Examination - closed book	Examination - closed book	2 hours	70%
Summative	Coursework	A technical report on the laboratory practicals	-2000 words	30%

Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>.

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.