



Module Specification

Non Linear Structural Analysis

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Part 1: Information

Module title: Non Linear Structural Analysis

Module code: UBGMUA-15-M

Level: Level 7

For implementation from: 2021-22

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Geography & Environmental Mgmt

Partner institutions: None

Delivery locations: Frenchay Campus

Field: Geography and Environmental Management

Module type: Standard

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: In this module, you will examine the analysis of non-linear behaviour of structures.

Features: Not applicable

Educational aims: See Learning Outcomes

Outline syllabus: The module will cover:

Geometric non-linearity, buckling and geometric stiffness.

Equilibrium paths.

P-delta effects.

Material non-linearity.

Inelastic buckling.

Numerical solutions for non-linear structural analysis.

Non-linear dynamic response of structures.

Capacity design principles for earthquake engineering.

Part 3: Teaching and learning methods

Teaching and learning methods: See Assessment.

Module Learning outcomes:

MO1 Identify when geometric and material non linearity may be important for structural systems.

MO2 Calculate the geometric stiffness of discrete systems.

MO3 Calculate the non-linear response of simple structural systems.

MO4 Use non-linear finite element analysis to design complex structures taking into consideration health and safety issues during design stage.

MO5 Use material and geometric non linearity to assess structures subject to dynamic loads.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ubgmua-15-m.html) via the following link <https://uwe.rl.talis.com/modules/ubgmua-15-m.html>

Part 4: Assessment

Assessment strategy: Component A: Report (3000 words excluding appendices and references).

A coursework submission to demonstrate the ability to use numerical modelling to analyse and design a structure under complex loading that includes earthquakes. The report must show ability to present the design outcomes in professional drawings and sketches.

Resit strategy: Students will submit a report which will be a variation agreed with the module leader.

Assessment components:

Report - Component A (First Sit)

Description: Coursework (3000 words report, excluding appendices and references).

Weighting: 100 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Report - Component A (Resit)

Description: Coursework (3000 words report, excluding appendices and references)

Weighting: 100 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Civil Engineering [Sep][FT][Frenchay][1yr] MSc 2021-22

Civil Engineering [Sep][PT][Frenchay][2yrs] MSc 2021-22

Civil and Environmental Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19