

Module specification

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Module Code	AUR495_AURH495
Module Title	Civil Engineering Design
Level	4
Credit value	10
Faculty	Faculty of Arts, Computing & Engineering
HECoS Code	100148
Cost Code	GABE

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
BSc (Hons) Architectural Design Technology	Option
BSc (Hons) Building Surveying	Option
BSc (Hons) Building Surveying Degree Apprenticeship	Option
BEng (Hons) Civil Engineering Degree Apprenticeship	Core
BSc (Hons) Construction Management	Option
BSc (Hons) Construction Management Degree Apprenticeship	Option
BSc (Hons) Quantity Surveying	Option
BSc (Hons) Quantity Surveying Degree Apprenticeship	Option
HNC Construction Technology	Option

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	12 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	6 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	18 hrs
Placement / work-based learning	0 hrs
Guided independent study	82 hrs
Module duration (total hours)	100 hrs

For office use only	
Initial approval date	3 rd July 20224
With effect from date	September 2024
Date and details of revision	
Version number	1

Module aims

The module aims to introduce the students to the basic principles of design and to develop conceptual and creative thinking. Students will work collaboratively, exploring concept design ideas, optioneering and the development of safe, practical, and sustainable solutions, at the initial stages of an infrastructure-based project.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Assimilate / work with information that may be incomplete and identify uncertainty and constraints.
2	Develop awareness of conceptual structural, infrastructure or geotechnical technologies and design solutions/options to a Civil Engineering design problem; interpreting briefs; identifying key issues and selecting solutions.
3	Appreciate how civil engineers design and construct infrastructure using appropriate technical literature, resources, materials, equipment, legislation, sustainably (Climate Change and United Nations Sustainable Development Goals) and with professional ethics at the core of the process.
4	Work collaboratively and use sketching, models, hand calculation, software, and other techniques to develop and communicate design thinking and solutions.

Assessment

Indicative Assessment Tasks:

The module will be assessed through a series of tasks, forming a portfolio of evidence, relating to the undertaking of the development of a preliminary sustainable design solution to a client brief, to be augmented with sketches, models, hand calculations, simulations and a simple specification and risk register. (Indicative word count: 2,000 words)

Where group tasks are detailed, students will be provided with an individual marking criterion.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1,2,3 & 4	Coursework	100%

Derogations

None



Learning and Teaching Strategies

The module will be presented to students through planned lecture series and programmed workshops and tutorials. An active and inclusive approach is used to engage students in the topics and will involve individual, group work and flipped learning experiences aligned to the university's Active Learning Framework (ALF). The approach offers students a flexible and adaptive learning experience that can accommodate a range of options that includes both on campus learning and remote learning where appropriate.

The Moodle VLE and other on-line materials and resources will be available to support learning. ALF offers a balance between the classroom elements and digitally enabled activity incorporating flexible and accessible resources and flexible and accessible feedback to support learning.

Students will work in groups to develop a sustainable, safe, and practical solutions to a design problem and use the workshop facilities to model their solution.

Progress reviews will be set up and managed by the student groups and classroom delivery will be supplemented with opportunities for guest lecturers to bring specific topic expertise into the delivery. Where possible, site visits will also be organised for students to meet professionals from across the sector and to visit sites either under construction or developed.

Tutorials – Close interaction with students ensuring that the work presented during lectures has been understood, with specific help being given to overcome any learning problems, should they occur.

Indicative Syllabus Outline

The roles and responsibilities of the Civil Engineer.

Client briefs.

Identifying key requirements and Constraints.

Rapid communication – sketching/ modelling/ simulation.

Soil Mechanics and Environmental impact.

Introduction to Earthworks and foundation selection.

Temporary, permanent dewatering, ground treatment and slope stability techniques

Techniques used in deep excavation and trenching works.

Actions on structures, design standards and basic load analysis.

Health Safety and Welfare.

Technologies, Resources and Sustainability.

Optioneering Design Solutions.

Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads

Millais, M. (2017), *Building Structures: Understanding the Basics*. 3rd ed. London: Routledge.

Other indicative reading

Barnes, G.E. (2016), *Soil Mechanics: Principles and Practice*. 4th ed. London: Macmillan Education.

Cobb, F. (2015), *Structural Engineer's Pocketbook Eurocodes*, 3rd ed. Boca Raton, Florida: CRC Press.

Slade, R. (2016), *Sketching for Engineers and Architect*. London: Routledge.

Chartered Institute of Architectural Technologists www.ciat.org.uk

Chartered Institute of Building www.ciob.org.uk

Ordnance Survey www.ordnancesurvey.co.uk/

Institution of Civil Engineers www.ice.org.uk.

Royal Institute of British Architects www.architecture.com

Designing Buildings Wiki www.designingbuildings.co.uk

Institution of Structural Engineers (www.istructe.org.uk)

Other sources:

IHS Database www.ihsti.com