

## Module specification

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Module Code	AUR4A4/AURH4A4
Module Title	Digital Technologies in Surveying
Level	4
Credit value	20
Faculty	Faculty of Arts, Computing & Engineering
HECoS Code	100219
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	Core
BSc (Hons) Building Surveying	Core
BSc (Hons) Building Surveying Degree Apprenticeship	Core
BEng (Hons) Civil Engineering Degree Apprenticeship	Core
BSc (Hons) Construction Management	Core
BSc (Hons) Construction Management Degree Apprenticeship	Core
BSc (Hons) Quantity Surveying	Core
BSc (Hons) Quantity Surveying Degree Apprenticeship	Core
HNC Construction Technology	Core

## Pre-requisites

None

## Breakdown of module hours

Learning and teaching hours	18 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	30 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
<b>Total active learning and teaching hours</b>	<b>48hrs</b>
Placement / work-based learning	0 hrs



Learning and teaching hours	18 hrs
Guided independent study	152 hrs
<b>Module duration (total hours)</b>	<b>200hrs</b>

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

## Module aims

This module is designed to develop skills in using modern surveying equipment to carry out a range of typical site surveying procedures in the construction and built environment sector.

The module provides an opportunity to develop an understanding of the principles of levelling, site surveying, setting out, as well as providing an understanding of the skills required to perform surveying calculations and control.

This module will also provide an understanding of the software available to facilitate data exchange, for a range of uses in construction.

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

1	Undertake a fieldwork survey to establish a station network for horizontal and vertical control.
2	Be able to use modern site surveying instruments and provide traverse and other control calculations for instruments which may include Levels, Total Stations, GNSS (Global Navigation Satellite Systems) RTK rover, Scanners and Drones.
3	Recognise technical literature, standards, and software available for site surveying and demonstrate how survey data is exported to formats suitable for design packages and project management tools.
4	Demonstrate knowledge of relevant legislation, specifically health and safety risks, well-being and environmental legislation

## Assessment

Indicative Assessment Tasks:

The assessment will be provided through practical tasks, forming a portfolio of evidence, relating to the undertaking of a group exercise to include levelling, setting out and a closed traverse topographical survey, using a variety of instruments.

The practical assessment and portfolio will provide evidence of individual calculations demonstrating correction methods, accuracy, errors and appropriate data management and risk assessment.



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	Practical	100

## Derogations

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None

## Learning and Teaching Strategies

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The module will be presented to students through planned lecture series, practical 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.

Practical instruction sessions in the use of relevant equipment will encourage application of theory to practice and key lectures will impart relevant surveying theory and techniques. Students will in general work as individuals, but group work will be required for practical surveying work.

IT workshops will be facilitated through this module and Digital Technologies in Drawing and Modelling to explore and utilise specialist IT software and immersive environments.

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

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The lectures will include:

- Risk Assessment.
- Control methods.
- Levelling techniques.
- Setting out techniques.
- Open, link and closed traverse for area control.
- Grid references and Coordinate systems.
- Closing errors, correction, and accuracy.
- Data management.

Practical use of electronic and laser instruments to include:

Total Stations.



Global Positioning Systems (GPS).  
Scanners and drone application to produce and check topographical survey.  
Raw data and translation for cartographic detail.  
Use of OS digital data.  
Consideration of GPS controlled machines.  
Drone and scanner technology and software.

## **Indicative Bibliography:**

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

### **Essential Reads**

Irvine, W. (2005), *Surveying for Construction*. 5<sup>th</sup> edition. London: McGraw Hill.

### **Other indicative reading**

Uren, J. and Price, W. (2010), *Surveying for Engineers. 5th Ed.* Basingstoke: Palgrave Macmillan.

Royal Institution of Chartered Surveyors [www.rics.org](http://www.rics.org)

Chartered Institute of Architectural Technologists [www.ciat.org.uk](http://www.ciat.org.uk)

Chartered Institute of Building [www.ciob.org.uk](http://www.ciob.org.uk)

Ordnance Survey [www.ordnancesurvey.co.uk/](http://www.ordnancesurvey.co.uk/)

Royal Institution of Chartered Surveyors [www.rics.org](http://www.rics.org)  
Institution of Civil Engineers [www.ice.org.uk](http://www.ice.org.uk)

Royal Institute of British Architects [www.architecture.com](http://www.architecture.com)

Designing Buildings Wiki [www.designingbuildings.co.uk](http://www.designingbuildings.co.uk)

Institution of Structural Engineers ([www.istructe.org.uk](http://www.istructe.org.uk))

### **Other sources:**

IHS Database [www.ihsti.com](http://www.ihsti.com)