

## Module specification

When printed this becomes an uncontrolled document. Please access the **Module Directory** for the most up to date version by clicking on the following link: [Module directory](#)

Module Code	AUR5A5
Module Title	Building Services
Level	5
Credit value	20
Faculty	Faculty of Arts, Computing and Engineering
HECoS Code	100147
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
BSc (Hons) Construction Management	Core
BSc (Hons) Construction Management Degree Apprenticeship	Core
BSc (Hons) Quantity Surveying	Core
BSc (Hons) Quantity Surveying Degree Apprenticeship	Core

## Pre-requisites

None

## Breakdown of module hours

Learning and teaching hours	30 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
<b>Total active learning and teaching hours</b>	<b>30 hrs</b>
Placement / work-based learning	0 hrs
Guided independent study	170 hrs
<b>Module duration (total hours)</b>	<b>200 hrs</b>

For office use only	
Initial approval date	3 <sup>rd</sup> July 2024



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

## Module aims

This module aims to support students to develop a sound understanding of the principles and concepts of key building services. By the end of the module, students will understand the interdisciplinary nature and requirement for integration between the core services and have an appreciation of the requirement for integration of building services in sustainable design and modern construction practices.

Students will be given opportunities to develop skills for designing, implementing, and managing building services systems, cultivating critical thinking and problem-solving abilities related to building services challenges experienced in industry.

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

1	Evaluate the technical, socioeconomic and environmental factors influencing the design, installation, and operation of building services systems, in the context of building performance, energy efficiency, and occupant comfort.
2	Contrast different design options for building services systems, evaluating their advantages, limitations, and suitability for various building types and usage scenarios.
3	Select and justify materials and components for building services systems to solve practical problems relating optimisation, control and monitoring
4	Demonstrate proficiency in applying building services engineering principles to propose innovative design solutions that prioritise sustainability, resource efficiency, and occupant well-being, considering the diverse needs of building users.

## Assessment

Indicative Assessment Tasks:

- Exam consisting of multiple choice and written tasks related to core building services (2hrs, 50% weighting)
- Written assessment on modern practices of building services design (50%) (2,500 words +/- 10%)

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	2 & 3	Examination	50
2	1 & 4	Written Assignment	50



## Derogations

---

N/A

## Learning and Teaching Strategies

---

The module will be delivered through a series of formal lectures which details the functions and principles of building services, their management and optimisation, integration with buildings and other building services, and the context in which they are applied.

Delivery will incorporate the principles of the University's Active Learning Framework (ALF), so that learning opportunities are both synchronous and asynchronous, and are supported by an accessible range of material resources. Site visits undertaken as part of this, or other associated modules will provide appropriate vehicles for aspects of building services to be considered in site-specific contexts.

The assessments will provide an opportunity for summative feedback to help enhance and develop the student skillset required for Level 5 studies.

## Indicative Syllabus Outline

---

The syllabus covers the spectrum of typical building services and associated systems, with some focus on specialist services often found in private and public sector buildings:

1. Heating, Ventilation, and Air Conditioning (HVAC) Systems
2. Refrigeration and Chilled Water
3. Electrical Distribution Systems
4. Mechanical (Pressure) and Plumbing Systems
5. Fire Protection Systems
6. Lifts
7. Building Management Systems (BMS) and the Internet of Things (IoT)
8. Renewable Energy Integration
9. Sustainable Design and Green Building Technologies
10. Building Services for Accessibility
11. Building Services in Smart Cities
12. Energy Management and Efficiency
13. Indoor/Outdoor Air Quality Management
14. Emergency Power and Redundancy
15. Digital Twin and other Technologies

The syllabus will investigate key concepts in design, installation and management of the above services through whole life cycle from cradle to cradle. Considerations including costing, data management, value engineering, change control, legal, regulatory and ethics will be explored. Sustainability will be a key topic and the syllabus will cover a spectrum of challenges facing built environment practitioners, such as cost benefits, integration of technology, material selection, influencing client behaviours, legislation, and regulatory instruments.

## Indicative Bibliography:

---

### Essential Reads

Hall, F. and Greeno, R. (2024), *Building Services Handbook*. 10<sup>th</sup> Ed. Oxon: Routledge.



**Other indicative reading**

Chadderton, D. V. (2013), *Building Services Engineering*. 6<sup>th</sup> Ed. Oxon: Routledge

Tymkow, P., Tassou, S., Kolokotroni, M. and Jouhara, H. (2021), *Building Services Design for Energy-Efficient Buildings*. 2<sup>nd</sup> Ed. Oxon: Routledge.

McMullan, R. (2018) *Environmental Science in Building*. 8<sup>th</sup> Ed. London: Red Globe Press.

Chartered Institute of Building Services Engineers [www.cibse.org](http://www.cibse.org)

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

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

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)

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)

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