University of the Built Environment
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Mechanical and Public Health Engineering

Module Descriptor

Module Code:	BSE4MPH
Version:	V1.00
Status:	Final
Date:	25/03/2026

Summary Module Details

Module details

Module Title: Mechanical and Public Health Engineering

Module Leader: TBC

Module Mode: Supported online learning

Semester: Autumn (UK) and Spring (UK)

Level: 4

Credits: 20 Hours

Learning Hours: 200

Contact & Study Hours

Directed Study Time: 90 hrs (45%)

Self-directed Study Time: 50 hrs (25%)

Assessment Study Time: 60 hrs (30%)

Assessment Type

Coursework: 80%

Computer Marked Assessment: 20%

Module Summary

This module introduces the design and application of mechanical and public health systems within buildings. It covers the principles of LTHW heating systems, ventilation strategies, and domestic water services, alongside drainage and gas installations. Students will explore low-carbon technologies, pipe and system sizing, and safety considerations in piped systems design. Mathematical skills are developed through pressure loss calculations, pipe sizing formulas, and flow rate analysis. Core thermodynamic and fluid mechanics principles—such as heat transfer, energy balance, and flow regimes—are embedded and applied within the design and analysis of real building services systems. Emphasis is placed on compliance, sustainability, and the contribution of these systems to overall building performance and occupant wellbeing.

Taken on which Programmes

CertHE Building Services Engineering **(C)**

Core (C) or Elective (E)

Module Aims

This module aims to:

- Introduce the design and application of mechanical and public health systems within buildings.
- Develop understanding of LTHW heating, ventilation strategies, domestic water services, drainage, and gas installations.
- Explore low-carbon technologies, system sizing, and safety considerations in piped system design.
- Build applied mathematical skills through pressure loss calculations, pipe sizing formulas, and flow rate analysis, reinforcing the underlying thermodynamic and fluid flow principles relevant to heating, cooling, and ventilation systems.
- Emphasise compliance, sustainability, and the role of these systems in enhancing building performance and occupant wellbeing.

Module Learning Outcomes

LO1 Explain the principles of domestic water, waste, and drainage systems in compliance with public health standards.

LO2. Describe the functions and key components of mechanical systems, including heating, ventilation, and cooling.

LO3 Apply basic design calculations to determine flow rates, pipe or duct sizing, and equipment selection.

LO4 Assess the performance and efficiency of low-carbon and renewable mechanical systems in a given context.

Indicative Module Content

Module topics

Fundamentals of Mechanical and Public Health Systems

The module begins by introducing the principles of low-temperature hot water (LTHW) heating, ventilation strategies, and domestic water services. Students explore the role these systems play in maintaining occupant comfort, hygiene, and safety within buildings.

Drainage, Gas, and System Safety

Attention then shifts to drainage and gas installations, with a focus on design principles, safety considerations, and the interaction of these systems with wider building services. Compliance with regulations and safe installation practices are emphasised to highlight professional responsibility.

Low-Carbon Technologies and Performance

Students examine low-carbon and sustainable technologies relevant to mechanical and public health systems. This theme explores system efficiency, integration with renewable energy solutions, and the contribution of modern technologies to reducing environmental impact and supporting wellbeing.

Applied Design Skills and Compliance

The module concludes by developing applied skills in pipe and system sizing, using calculations for flow rates, pressure losses, and pipe dimensions. Emphasis is placed on using these skills in practical design scenarios, supported by industry standards and compliance frameworks, before consolidating learning in a wrap-up session.

Thermodynamic and fluid mechanics principles underpin all sizing and performance calculations within this module. Concepts such as heat transfer, temperature gradients, energy loss, and pressure dynamics are embedded within applied exercises, allowing students to develop both conceptual understanding and practical competence in system design.

Overview of Assessment

Each module follows a progressive structure of **two summative assessments** designed to build confidence, competence and professional judgement.

Assessment 1 is a computer-marked assessment (CMA) that provides early feedback and supports consolidation of core knowledge and principles. Positioned mid-module, it acts as both a confidence booster and a diagnostic opportunity to identify areas requiring further support, ensuring students are well prepared for the final assessment.

Assessment 2 is an integrated applied task that develops professional competence and judgement through two complementary components.

Part 1 – Developing Professional Judgement
Students interpret and communicate technical information using provided drawings, schedules and structured templates. They analyse well-defined engineering scenarios and present clear, concise technical responses. At this level, no original design production is required; evidence is demonstrated through mark-ups, brief technical commentary and completion of pro-forma documentation.

Part 2 – Applied Professional Output and Reflection
Students produce applied outputs in authentic industry formats (e.g., technical specifications, compliance notes, risk assessments or structured reports). This component aligns with Senior Technician practice and End Point Assessment expectations, requiring clear, usable professional documentation suitable for real project contexts. A structured reflective element supports the development of professional judgement and readiness for progression.

Module learning outcomes	**Assessment**	**Word count or equivalent**	**Weighting**
LO1 & LO2	**Assessment 1** CMA	600 words equivalent	20%
LO1, LO2, LO3 & LO4	**Assessment 2** Coursework	2,400 words equivalent	80%

Module Pass Mark (as a weighted average of all assessments): 40%

Students will also be offered optional pre-course reading and self-assessment activities to refresh basic technical and mathematical skills before starting the module.

Students are encouraged to complete optional pre-course reading and diagnostic quizzes to familiarise themselves with key environmental and scientific principles prior to engaging with the module content.

Key Module Learning Resources

Core Sources and Texts

The core reading resources within each module will be provided via the specific Virtual Learning Environment (VLE) module pages and within the e-Library. Additional reference material and supplementary resources to support your studies are available through the university e-Library.

Module tools

Students will have access to study materials, dedicated academic support, student forums, and learning activities via an online learning platform (VLE).

The module page on the VLE is broken down into structured study weeks to help students plan their time, with each week containing a mixture of reading, case studies, videos/recordings and interactive activities to go through. Online webinars/seminars led by the Module Leader can be attended in real time and provide opportunities to consolidate knowledge, ask questions, discuss topics and work through learning activities together. These sessions are recorded to support students who cannot attend and to enable students to recap the session and work through it at their own pace. Module forums on the VLE provide further opportunities to discuss topics with other students, complete collaborative work and get extra help from the module team.

Professional online resources

The e-Library provides access to trusted, quality online resources, selected by subject specialists, to support students' study. This includes journals, industry publications, magazines, academic books and a dissertation/work-based library. For a list of the key industry specific and education resources available please visit the VLE e-Library.

Other relevant resources

Access is also provided to further information sources that include the British Library and Open University UK catalogues, as well as providing a monthly current awareness service entitled, ***Knowledge Foundations*** - a compendium of news, research and resources relating to the educational sector and the Built Environment.

The module resource list is available on the module VLE page and is updated regularly to ensure materials are relevant and current.