

Electrical Building Services and Controls

Module Descriptor

Module Code: BSE4EBS
Version: V1.00
Status: Final
Date: 25/03/2026

Summary Module Details

Module details

Module Title: Electrical Building Services and Controls

Module Leader: Dr Jackie Portman

Module Mode: Supported online learning

Semester: 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 provides a comprehensive overview of electrical systems and associated control technologies used in buildings. Key topics include low-voltage electrical distribution, standby power systems, lighting design, fire detection interfaces, and ICT infrastructure. Students will explore the principles of electrical safety, including earthing and bonding, and gain an understanding of building management systems (BMS) and the integration of control strategies. The module includes fundamental calculations for electrical load estimation, cable sizing, and power demand assessment. It also introduces regulatory frameworks such as BS 7671, with emphasis on coordinating electrical systems alongside mechanical and public health services in multi-service environments.

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Taken on which Programmes

CertHE Building Services Engineering (c)

Core (C) or Elective (E)

Module Aims

This module aims to:

- Provide an overview of electrical systems and associated control technologies within buildings.
- Develop understanding of low-voltage electrical distribution, standby power systems, lighting design, fire detection interfaces, and ICT infrastructure.
- Explore the principles of electrical safety, including earthing, bonding, and protective measures.
- Introduce building management systems (BMS) and control strategies, with emphasis on multi-service integration.
- Build applied skills in electrical load estimation, cable sizing, and power demand assessment, underpinned by regulatory frameworks such as BS 7671.

Module Learning Outcomes

- LO1 Explain the principles of low-voltage distribution, protection, and earthing systems.
- LO2 Apply basic electrical design methods to determine cable sizes, circuit layouts, and load demands.
- LO3 Describe how lighting, emergency power, and fire alarm systems are integrated into building services design.
- LO4 Use digital tools to analyse and verify simple electrical designs for compliance and safety.

Indicative Module Content

Module topics

Fundamentals of Electrical Building Services

The module begins with the principles of low-voltage electrical distribution and the role of electrical systems in modern buildings. Students are introduced to key concepts such as load estimation, cable sizing, and power demand, building the foundation for more complex applications.

Power, Lighting, and Safety Systems

Attention turns to the design and application of standby power systems, lighting installations, and fire detection interfaces. This theme emphasises both performance and safety, highlighting earthing, bonding, and protective measures that ensure systems operate safely and reliably.

Controls, BMS, and ICT Infrastructure

Students explore the principles of building management systems (BMS), control strategies, and ICT infrastructure, examining how smart technologies integrate multiple building services. The focus is on how control systems improve efficiency, resilience, and user comfort in complex environments.

Regulations, Integration, and Application

The final theme consolidates learning by focusing on regulatory frameworks such as BS 7671 and how these guide professional practice. Students apply their knowledge to multi-service integration, developing the ability to coordinate electrical, mechanical, and public health systems in real-world building contexts.

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.

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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.

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