

Summary Information

Module Code	5341BEUG
Formal Module Title	Design Project 2
Owning School	Civil Engineering and Built Environment
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 5
Grading Schema	40

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Laurence Brady	Yes	N/A

Module Team Member

Contact Name	Applies to all offerings	Offerings
Hu Du	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
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Teaching Responsibility

LJMU Schools involved in Delivery
Civil Engineering and Built Environment

Learning Methods

Learning Method Type	Hours
Lecture	20
Tutorial	30

Module Offering(s)

Offering Code	Location	Start Month	Duration
JAN-CTY	CTY	January	12 Weeks

Aims and Outcomes

Aims	To provide students with the knowledge and skills necessary to interpret the mechanical and electrical building services needs and requirements of a range of simple and moderately complex buildings and develop practical schemes. To develop and refine skills necessary for the development, management and successful completion of a significant project. To develop and refine written, verbal, graphical and presentation skills.
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Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Analysis of client and building needs related to all electrical and mechanical building engineering systems and produce technical sustainable solutions.
MLO2	Produce a mechanical electrical design project comprising (depending on client requirements), low temperature hot water heating, air conditioning/ventilation systems, PHE systems-domestic hot/cold water systems, above/below ground drainage, control/BMS systems, elevators, electrical distribution, small power and lighting, lightning protection, telecoms/data, fire and intruder alarms.
MLO3	Develop the skills and knowledge necessary to ensure that the various services co-ordinate within the project.
MLO4	Recognise and apply relevant guidance and statutory regulations within a design context. (IET Wiring Regulations, Building Regulations, CIBSE Guides etc.)

Module Content

Outline Syllabus

Analysis of client and building needs related to all electrical and mechanical building engineering systems. Analysis of alternative engineering design solutions with due regard to life cycle costing and sustainability. Accommodation of distribution services: distribution patterns, horizontal, vertical, provision for future development, access and maintenance. Co-ordination of services – under-floor distribution, rising mains, trunking, conduit etc. Design of all systems with due regard to published design guidance, standards and relevant legislation, consideration of health, safety and welfare arrangements, and energy efficiency and sustainability considerations. Cold water supply systems: water sources, treatment & supplies, direct and indirect distribution systems, typical plant requirements, boosted systems for tall buildings. Hot water supply systems: common systems (point of use, centralised, cistern fed and unvented), plant and energy requirements. Drainage: building drainage systems, above and below ground, legislation and standards, systems, sizing. Building heating systems: primarily LTHW heating systems, heat emitters and plant, fuels and energy requirements, pipework arrangements, layout, specification and control systems, integration of heating requirements with other services installations. Ventilation: ventilation requirements and air supply rates, utilisation of natural ventilation, mechanical systems selection and design, sizing and selection of plant and ductwork. Air conditioning systems: small packaged systems and split systems, large centralised systems. Typical control techniques and systems, sizing and selection of plant, ductwork and pipework. Large and small power requirements for fixed equipment and plant. Electrical power distribution, 3-phase and single phase distribution. Electrical control systems and building management systems. Telecommunications and data distribution. Lighting systems and design.

Module Overview

This module provides students with the knowledge and skills necessary to interpret the mechanical and electrical building services needs and requirements of a range of simple and moderately complex buildings and develop practical schemes. Students develop and refine the skills necessary for the development, management and successful completion of a significant project, including written, verbal, graphical and presentation skills.

Additional Information

The module introduces the students to Building Services Engineering to a variety design based group work tasks mostly working in groups but with elements of individual work including personal development planning. It is envisaged that students will be working alongside Architectural Engineering students on a complementary design project module. On the Building Services Engineering Degree Apprenticeship programme, the knowledge learning outcomes are K1, K2, K4, K5, K6, K7, K8, the skills learning outcomes are S1, S2, S3, S4, S5, S6, S7, S8 and the behaviours learning outcomes are B1, B2, B3, B4, B5, B6 and B7.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Learning Outcome Mapping
Portfolio	Portfolio	100	0	MLO3, MLO1, MLO4, MLO2