

Liverpool John Moores University

Title: BUILDING SERVICES ENGINEERING PROJECT 2
Status: Definitive
Code: **5218BEUG** (122824)
Version Start Date: 01-08-2021

Owning School/Faculty: Civil Engineering and Built Environment
Teaching School/Faculty: Civil Engineering and Built Environment

Team	Leader
Laurence Brady	Y
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Academic Level: FHEQ5 **Credit Value:** 20 **Total Delivered Hours:** 60

Total Learning Hours: 200 **Private Study:** 140

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	30
Tutorial	30

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	FEASIBILITY REPORT	40	
Portfolio	AS2	DETAILED DESIGN FOLIO	60	

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.

Learning Outcomes

After completing the module the student should be able to:

- 1 Analyse a variety of buildings ranging from simple domestic buildings to moderately complex commercial and industrial buildings, to identify, evaluate and justify the need for mechanical and electrical building engineering systems.
- 2 Evaluate alternative strategies for the mechanical and electrical building engineering systems across the range of buildings to encourage energy efficiency and sustainable design.
- 3 Produce detailed designs for a range of mechanical and electrical building engineering systems for a range of buildings and evaluate these in terms of utility, building user requirements, sustainability and energy efficiency;
- 4 Apply the principles and practices of planning, time and task management effectively.
- 5 Communicate concepts, proposals and strategies to technical and non-technical audiences using a variety of media.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

FEASIBILITY REPORT	1	2	5
DETAILED DESIGN FOLIO	3	4	5

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.

Learning Activities

The module is delivered through a large multi-task project which requires the students to produce designs or propose commercial procedures, recommendations, solutions for tasks based on the engineering services needs of a moderately complex building. The specific tasks of the project are selected to reflect the particular aspects of engineering services in which the student specialises. Inter-disciplinary working is actively encouraged and facilitated.

Notes

This module provides the students with an opportunity to demonstrate their learning from all modules across their programme. The module requires the students to complete a specific building engineering project working within small teams, which should be multi-disciplinary where the mixture of specialisms within a student cohort allow.