

Liverpool John Moores University

Title: BUILDING SERVICES INSTALLATION PRINCIPLES AND TECHNIQUES
Status: Definitive
Code: **4611BEFDL** (123925)
Version Start Date: 01-08-2016
Owning School/Faculty: Built Environment
Teaching School/Faculty: City of Liverpool College

Team	Leader
Alfred Leung	Y

Academic Level: FHEQ4
Credit Value: 10
Total Delivered Hours: 50
Total Learning Hours: 100
Private Study: 50

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	35
Tutorial	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	FORMAL EXAMINATION	100	3

Aims

The module is intended to provide a detailed level of understanding of building engineering services for those working in the building services engineering sector, or who interface regularly with it, but are not intending to become specialist Building Services Engineers themselves. As such the module is intended to provide the students with a good understanding of the various systems, equipment and installations together with the processes, techniques and principles involved in the planning, design and installation of modern building engineering services.

Learning Outcomes

After completing the module the student should be able to:

- 1 Describe the principles and techniques required for the planning, design and installation of plant and equipment used for space heating, ventilation, air-conditioning, hot and cold water and fuel gas services installations in public sector, commercial & industrial buildings.
- 2 Describe the principles and techniques required for the planning, design and installation of plant and equipment used for electrical, data and communication installations within public sector, commercial & industrial buildings.
- 3 Describe the principles characteristics and legislative implications associated with the planning and installation of firefighting and fire/smoke detection installations.

Learning Outcomes of Assessments

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

FORMAL EXAMINATION 1 2 3

Outline Syllabus

Types of Client: Recognising the specific needs and requirement of clients from different sectors, identification of appropriate design guides, publications and standards e.g. health care, education, sports etc.

Thermal Comfort in Buildings: Need for heating, ventilation and air conditioning; analysis and interpretation of client and building operational requirements; energy efficiency; statutory and legal requirements. Thermal response of buildings and methods used for establishing heating and cooling loads.

Space heating in buildings: Design and installation considerations for the use of low, medium and high pressure hot water systems, steam, warm air, radiant tube systems. Implications of selecting different heating plant, fuels and energy sources.

Boiler and ancillary plant space requirements and services Legislative and environmental considerations. Control strategies.

Ventilation: natural and mechanical systems of ventilation, their application to a range of building types and situations. Ventilation plant and equipment, ductwork arrangements, high and low velocity systems. Fire and smoke venting.

Air conditioning: Alternative cooling strategies, justification for air conditioning, energy efficiency. Application, features, components, operating principles and control strategies for single and multi-zone air conditioning systems. Application of refrigeration with air conditioning systems, features, components, operating principles and control strategies for refrigeration systems within air conditioning applications.

Public Health Engineering: Features and characteristics of cold water supplies, special requirements for high-rise buildings, statutory requirements, materials and components, Installation requirements of domestic hot water supply systems, hot water generators, unvented systems and safety requirements. Minimising risk of Legionnaires Disease, specific issues associated with hospital and other health care buildings.

Electrical, Data and Communication Systems: small power and lighting & emergency lighting circuits, electrical distribution, protection systems and containment. Statutory constraints and requirements. Provision for communication: data handling control and Building Management systems and ICT systems including networking over a range of buildings.

Fuel Gas Installations: General principles, operational features, installation requirements. Statutory constraints and requirements.

Firefighting and fire/smoke detection installations: alarm and detection systems, the relationship of systems to escape routes, fixed firefighting and sprinkler installations, statutory constraints and requirements.

Learning Activities

Lectures, tutorials, case studies.

Notes

This module is intended for 'commercial' students from the buildings services sector (i.e. building services quantity surveyors etc.) and students from other construction disciplines who will benefit from a good grounding in modern building services installations.