

Liverpool John Moores University

Title: ELECTRICAL ENGINEERING FOR BUILDINGS
Status: Definitive
Code: **5217BEUG** (122819)
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
Maninder Pal	

Academic Level: FHEQ5 **Credit Value:** 20 **Total Delivered Hours:** 50

Total Learning Hours: 200 **Private Study:** 150

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	20
Tutorial	30

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	REPORT	50	
Test	AS2	TIME CONTROLLED OPEN BOOK TEST	50	

Aims

To further develop an appreciation of electrical principles and relate them to the practical processes applied in the design of electrical engineering services in buildings.

To provide students with the skills and knowledge required to appreciate industry

standard data and, by its application critically analyse the underpinning theoretical concepts which are incorporated in typical design techniques.

To provide students with the background knowledge so that they may complete electrical building engineering design.

To enable students to utilise appropriate mathematical methods to solve electrical engineering problems.

Learning Outcomes

After completing the module the student should be able to:

- 1 Analyse and resolve alternating and direct current circuits containing passive and active components.
- 2 Apply the theory of electrical resistance, inductance, capacitance and consequent reactive effects to practical electrical installations for buildings.
- 3 Select and specify equipment, cable types and associated switchgear for domestic and commercial electrical installations in accordance with the requirements of appropriate standards and legislation.
- 4 Analyse and evaluate methods of determining fault levels in power supply networks in terms of equipment and system protection, protection from electrical shock and protection against undesirable thermal effects.
- 5 Utilise appropriate mathematical methods to solve practical electrical engineering problems.

Learning Outcomes of Assessments

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

REPORT	2	3		
TIME CONTROLLED	1	2	4	5
OPEN BOOK TEST				

Outline Syllabus

Electrical principles which underpin electrical building services engineering design processes: Ohm's Law, AC and DC circuit, Kirchoff's Laws, single phase series and parallel RLC circuits, power factor, three phase systems, star and delta connection, power, application of complex numbers, transformers.

Fundamental requirements for safety, earthing, protection, isolation switching and control, circuit design, special locations, inspection and testing.

Power assessment: load factors, assessment of demand, power for mechanical services.

Specification requirements: analysis of client requirements

Alternating current fundamentals; period, frequency, angular frequency; peak, rms and instantaneous values; complex representation of sinusoidal quantities, phasors.

Electrical networks; single phase AC circuits, quantities in series, parallel and combined RLC networks.

Resonant AC circuits; circuit resonance, circuit conditions at resonance for various arrangements of induction coil and capacitor, resonant frequency and dynamic frequency.

Power factor; true, reactive and apparent power; power factor correction.

Appropriate engineering mathematics associated with the solution of problems in electrical engineering.

Learning Activities

Lectures, tutorials, workshops, occasional site visits

Notes

This module is designed to run in semester 1 alongside the complementary Mechanical Engineering for Buildings module to provide students with the necessary grounding in the underpinning principles of Electrical Engineering so that they may undertake the appropriate Design Project module in semester 2. Appropriate engineering mathematics is included as required.