

Liverpool John Moores University

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Title: ELECTRICAL INSTALLATIONS B
Status: Definitive
Code: **5008BEFD** (108470)
Version Start Date: 01-08-2011

Owning School/Faculty: Built Environment
Teaching School/Faculty: Liverpool Community College

Team	Leader
Derek King	Y

Academic Level: FHEQ5
Credit Value: 12.00
Total Delivered Hours: 64.00
Total Learning Hours: 120
Private Study: 56

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	42.000
Tutorial	12.000
Workshop	7.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Controlled assignment under exam conditions	50.0	3.00
Portfolio	AS2	Project based assignment	40.0	
Portfolio	AS3	Practical based assignment	10.0	

Aims

To further develop a detailed understanding of the principles and practices of low voltage electrical distribution in a wide range of public sector, commercial or industrial buildings.

To provide the students with an opportunity to develop an understanding of some of

the more specialised aspects of electrical installations found in complex buildings.

Learning Outcomes

After completing the module the student should be able to:

- 1 Evaluate alternative electrical installation proposals and strategies to establish feasible design solutions.
- 2 Evaluate the need for and produce designs for standby and uninterruptible power supplies.
- 3 Analyse modes of vertical and horizontal transportation for buildings and develop appropriate electrical installation provision.
- 4 Investigate and analyse the operation of dc and ac motors, their selection and application within building services.
- 5 Investigate the application of rectification systems in the control of electric plant and equipment.

Learning Outcomes of Assessments

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

EXAM	2	3	4	5
PROJECT	1	2	3	4
PRACTICAL	4			

Outline Syllabus

Design criteria: design, designing for health and safety. Alternative approaches.

Feasible solutions: Establishment of alternative options, techniques for critical analysis of alternative solutions to identify most feasible.

Standby supplies: essential, critical, non-essential loads, Generator installations, single and multi-generator, automatic start-up arrangements, synchronisation.

Protection against over-current, reverse-power, voltage, frequency etc. Generator fuel and efficiency.

UPS systems; single phase, three phase-three phase, three phase-single phase. Static switch/by-pass.

Lift Operation & requirements: Passenger, goods and service lifts, fire fighting, evacuation and lifts for the disabled.

Lift control: attendant, single automatic push button control, collective, duplex, dispatch. Speed control safety devices, services in lift wells.

Roping and winding systems: above well, below well, compensating. Geared and gearless winding.

Hydraulic lifts: control, oil cooling.

Design of lift & Escalators: location of lifts, grouping. Assessment of demand: waiting time, handling capacity, arrival rate, estimation of population, daily occupancy, building type and height.

Passenger demand: handling capacity, traffic profiles, up-peak, round trip time,

calculation of handling capacity.

Escalators and walkways: safety devices, discharge capacity, fire control, guards at intersections, angle of inclination.

DC and AC motors: electromagnetic forces, motor principle, dc series/shunt motors, speed/torque characteristics, production of rotating magnetic field,

induction/synchronous motor principles and characteristics, starting methods,

inverters, soft-start, DOL, star delta etc, speed control, motor selection and ratings.

Operating principles of inverters, use of inverters to control speed of motors.

Principles of rectification: diode, half wave, full wave, rectifier circuits single and three phase, smoothing circuits, thyristor and applications, phase control and integral cycle control.

Learning Activities

Lectures, tutorials, case studies, workshops, site visits.

References

Course Material	Book
Author	BSI
Publishing Year	2004
Title	BS 7671 Requirements for Electrical Installations - IEE Wiring Regulations
Subtitle	
Edition	16th Edition
Publisher	BSI
ISBN	0863413700

Course Material	Book
Author	CIBSE
Publishing Year	2004
Title	Guide F: Energy Efficiency in Buildings
Subtitle	
Edition	
Publisher	CIBSE
ISBN	1903287340

Course Material	Book
Author	CIBSE
Publishing Year	2005
Title	Guide K: Electricity in Buildings
Subtitle	
Edition	
Publisher	CIBSE
ISBN	190328726X

Course Material	Book
Author	CIBSE
Publishing Year	2003
Title	Guide E: Fire Engineering
Subtitle	
Edition	
Publisher	CIBSE
ISBN	1903287316

Course Material	Book
Author	CIBSE
Publishing Year	2005
Title	Guide D: Transportation Systems in Buildings
Subtitle	
Edition	
Publisher	CIBSE
ISBN	1903287618

Course Material	Book
Author	Cook, P.
Publishing Year	2002
Title	Commentary on IEE Wiring Regulations (BS 7671: 2001)
Subtitle	
Edition	
Publisher	Institute of Engineering and Technology
ISBN	0852962371

Course Material	Book
Author	Cooper, D.A. & Inglis, J.
Publishing Year	2006
Title	Elevator and Escalator Micropedia
Subtitle	
Edition	
Publisher	International Association of Elevator Engineers
ISBN	095256968X

Notes

This module is a key component for those students wishing to complete the programme following a 'electrical' building services pathway. It develops the students depth of understanding of electrical installations by analysing some of the core concepts and exploring some of the more specialised applications and processes within electrical installations.