Liverpool John Moores University

Title:	SMART BUILDING SERVICES
Status:	Definitive
Code:	**7083BEPG** (119554)
Version Start Date:	01-08-2013
Owning School/Faculty:	Built Environment
Teaching School/Faculty:	Built Environment

Team	Leader
Derek King	Y
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Academic Level:	FHEQ7	**Credit Value:**	20.00	**Total Delivered Hours:**	53.00
Total Learning Hours:	200	**Private Study:**	147		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	44.000
Tutorial	6.000

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	UNSEEN EXAM	60.0	3.00
Essay	AS2	3000 WORD ESSAY	40.0	

Aims

To provide a broad knowledge of the principles and techniques used in the specification and maintenance of building services across a range of domestic and commercial property types

Learning Outcomes

After completing the module the student should be able to:

1 Critically appraise the range of sustainable technologies and techniques available to a building services engineer.
2 Apply current legalisation and best practise to design building service systems in a range of scenarios and suggest improvements where appropriate.
3 Critically evaluate the development of new technology in the context of building services.

Learning Outcomes of Assessments

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

EXAM	1	3
ESSAY	2	

Outline Syllabus

Hot and cold water systems, incorporating evaluation of direct and indirect systems, storage mechanisms and key system components. Domestic hot water systems will be introduced, along with appropriate legislation and issues such as legionella risk. The use of hot water for heating will be explained and different methods of implementation/control discussed dependant on property type. Issues such as hard/soft water and salinity will also be discussed. The importance of drainage systems will be evaluated and the notion of "Sustainable Urban Drainage Systems" introduced, along with water harvesting and other items related to the so-called "Green Agenda".

Fire protection engineering will be introduced, and the facilities/components to aid fire protection (active and passive) will be evaluated, including modern types of sensor/control systems in addition to forthcoming technologies. Discussion of wireless adoption in this area and the barriers evaluated.

Building comfort will be evaluated in terms of acoustics, heat and visual effects.

Heating and air conditioning (or cooling) systems will be introduced, looking at the importance of the heating medium, flow rate, zoning, system costs and types of emitter in terms of their suitability for use. Examples of system design on commercial and domestic scales will be presented, and heating controls evaluated.

Heat and vapour transfer mechanisms will be introduced with appropriate calculations introduced and practised, and students will become familiar with how to effectively size plant required for heating and cooling. Passive methods of cooling will be discussed in the context of building regulation (e.g. Approved Document L) and the green agenda.

Lighting principles, types of luminaire and their specification will be discussed, and students will become familiar with methods of measurement and prediction of luminaire output.

Electrical installations and distribution will be discussed along with the methods of electrical fault detection and protection based on practical examples.

Current BMS (building management systems) will be discussed, along with remote networking and how this feeds into the future cities concept.

Learning Activities

Lecture and tutorials.

References

Course Material	Book
Author	Chadderton, D.
Publishing Year	2004
Title	Building Services Engineering
Subtitle	
Edition	
Publisher	Spon Press
ISBN	0415315352

Course Material	Book
Author	Hall, F. & Greeno, R.
Publishing Year	2009
Title	Building Services Handbook
Subtitle	
Edition	
Publisher	Butterworth Heinemann
ISBN	9780080950921

Course Material	Book
Author	Parnham, Phil
Publishing Year	2012
Title	Assessing Building Services
Subtitle	
Edition	
Publisher	RICS
ISBN	9781842197264

Course Material	Book
Author	Jones W.P
Publishing Year	2001
Title	Air Conditioning Engineering

Subtitle	
Edition	
Publisher	Butterworth-Heinemann
ISBN	0750650745

Course Material	Book
Author	Moss K
Publishing Year	2003
Title	Heating and Water Services Design in Buildings
Subtitle	
Edition	
Publisher	Spon Press
ISBN	0415291852

Course Material	Book
Author	BSI
Publishing Year	2000
Title	'Hot and Cold Water Supply'
Subtitle	
Edition	
Publisher	Blackwell Science (UK)
ISBN	0632049855

Course Material	Book
Author	CIBSE
Publishing Year	2002
Title	'TM8: Minimising the Risk of Legionnaires Disease'
Subtitle	
Edition	
Publisher	CIBSE
ISBN	1903287235

Course Material	Book
Author	CIBSE
Publishing Year	2003
Title	'Lighting: Interior and Exterior'
Subtitle	
Edition	
Publisher	Architectural Press
ISBN	0750655526

Course Material	CD/DVD
Author	CIBSE
Publishing Year	2002
Title	Code for Lighting
Subtitle	
Edition	

Publisher	CIBSE
ISBN	0750656379

Course Material	Book
Author	CIBSE
Publishing Year	2004
Title	LG12: Emergency Lighting and Design
Subtitle	
Edition	
Publisher	CIBSE
ISBN	1903287510

Course Material	Book
Author	Tregenza P
Publishing Year	2004
Title	The Design of Lighting
Subtitle	
Edition	
Publisher	Spon Press
ISBN	0419204407

Course Material	Book
Author	Bayliss C
Publishing Year	1999
Title	Transmission and Distribution in Electrical Engineering
Subtitle	
Edition	
Publisher	Butterworth-Heinemann
ISBN	0750640596

Course Material	Book
Author	Hiley J., Hughes E. et al
Publishing Year	2004
Title	Hughes Electrical and Electronic Technology
Subtitle	
Edition	9th
Publisher	Prentice Hall
ISBN	0131143972

Course Material	Book
Author	CIBSE
Publishing Year	2006
Title	Guide A :Environmental Design
Subtitle	
Edition	
Publisher	CIBSE
ISBN	9781903287669

Course Material	Book
Author	CIBSE
Publishing Year	2005
Title	Guide B: Heating, Ventilation, Air Conditioning &
Subtitle	
Edition	
Publisher	CIBSE
ISBN	9781903287588

Course Material	Book
Author	CIBSE
Publishing Year	2003
Title	Guide E: Fire Engineering
Subtitle	
Edition	
Publisher	CIBSE
ISBN	9781903287316

Course Material	Book
Author	CIBSE
Publishing Year	2012
Title	Guide F: Energy Efficiency in Buildings
Subtitle	
Edition	
Publisher	CIBSE
ISBN	9781906846220

Course Material	Book
Author	CIBSE
Publishing Year	2004
Title	Guide G: Public Health Engineering
Subtitle	
Edition	
Publisher	CIBSE
ISBN	9781903287421

Course Material	Book
Author	CIBSE
Publishing Year	2009
Title	Guide H: Building control systems
Subtitle	
Edition	
Publisher	CIBSE
ISBN	9781906846008

Course Material	Book

Author	CIBSE
Publishing Year	2005
Title	Guide K: Electricity in Buildings
Subtitle	
Edition	
Publisher	CIBSE
ISBN	978190328726X

Notes

Will provide students with a broad understanding of building services for domestic and commercial property types, including their specification, application and practical examples. The role of technology in the building services discipline will be discussed including aspects such as building management systems, energy efficiency, fire safety engineering, etc in order to further highlight the role technologies play. Future possibilities such as enhanced sensors, wireless systems and advanced control will be discussed.