Subject Description Form

Subject Code	BRE349
Subject Title	Building Services I
Credit Value	3
Level	3
Pre-requisite	BRE2031
Objectives	This subject is intended to: 1. Provide students with an overview of the various building services engineering systems in modern buildings, 2. Understand the basic design intent of various building services systems and their integration with the building fabric and architectural features.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Possess a knowledge of the system configuration and operation of various building services systems. b. Relate how different building services systems can help to control and improve the indoor environment. c. Identify the relationships between the design of building services systems and the overall building design. d. Appreciate the cost and value relationship on the selection of appropriate building services systems. e. Relate issues on environmental impact to the design of building services systems and overall building design.
Subject Synopsis/ Indicative Syllabus	Plumbing & Drainage Water supply and drainage system for high rise buildings. Simple design on pipe sizing for plumbing and drainage pipes. Sewage treatment process. Electricity: Assessment of electricity demand. Lightning protection. Safety snd earthing provisions for electricity distribution within buildings. HVAC/MVAC: Assessment on the efficiency of air-conditioning and air mixing processes. Large scale air conditioning systems configuration and operation. Internal transportation: The configuration and operation of lifts and escalators. Assessment to the quality of services for lift operation. Fire Services: Prevention, detection and suppression systems. Passive approach to Fire Services. Integration of fire services system to other building services systems.

Teaching/Learning Methodology

The learning and teaching approaches for the subject comprises lectures, tutorials and laboratories.

Lectures aims at delivering the basic core of concepts whilst ideas and operations will be further elaborated and discussed in the tutorials. Presentation by students during tutorials on selected topics will also be arranged. Laboratories are provided to allow students to relate theories and concepts to real situation.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d	e	
1. Oral Presentation	16%	√	√			√	
2. Case Study Report	24%	√	√	√	√	√	
3. Examination	60%	√	√	√		√	
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assessment will be in the form of written examination, oral presentation, case study report and laboratories.

Written examination aims to assess students' ability to apply concepts learned for solving problems on building services design and operation.

Oral presentations on specific topics on building services serves to assess students' understanding to the topics chosen.

Case study report aims to consolidate students' knowledge and relating design of building services system to the overall building design.

Laboratories allow students to relate theories to actual practices and operations.

The split between coursework and examinations will be 40/60.

Student Study Effort Expected

Class contact:	
▪ Lectures	26 Hrs.
▪ Tutorials	13 Hrs.
Other student study effort:	
▪ Laboratory	9 Hrs.
▪ Self-Learning	72 Hrs.
Total student study effort	120 Hrs.

Reading List and References	**Recommended:** Burberry P. (1997) *Environment & Services*, 8th Edition, Longman Scientific & Technical. Chadderton D.V. (2007) *Building Services Engineering*, 7rd Edition, Taylor & Francis. Chadderton D.V. (1997) *Air Conditioning: A Practical Approach*, E & F.N. Spon. Hall F. & Greeno R. (2009) *Building Services Handbook*, 5th Edition, Longman. Wise A.F.E. (1995) *Water, Sanitary and Waste Services for Buildings*. Greeno R. (1997) *Building Services, Technology and Design*, Longman. Wang S. K. (2001) Air Conditioning and Refrigeration, 2nd Edition, McGraw Hill. **Supplementary:** HKSAR (2009), *Code of Practice for the Electricity (Wiring) Regulations*. HKSAR (2011), *Code of Practice for Fire Safety in Buildings*. HKSAR (2012), *Code of Practice for Minimum Fire Services Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment*. HKSAR, *Building Ordinance and Regulations* CAP.123. NFPA (1997) *Fire Protection Handbook*, 18th Edition. Stocker W.F. & Jones J.W. (1982) *Refrigeration and Air Conditioning*, McGraw Hill. BRE (various) *Digests and Current Papers*. Building Research Establishment, Garston, Watford, U.K. Various Standards and Codes published by British Standard Institution (BSI).