**Subject Code**: BRE453  
**Level**: 4  
**Contact Hours**: 42  
**Student Effort Hours**: Lect:28 Tut/Sem:14  
**Assessment Method**: Coursework 30%  
**Examination 70%**  
**Credit Value**: 3  
**Pre-requisites**: BRE303 or 392  
**Co-requisites**: Nil  
**Exclusions**: Nil  
**Subject Leader/Lecturer/Dept.**: (BRE)

### Subject Aim:

*This subject is intended to:*

1. Provide further knowledge of building services engineering systems and an understanding of the importance of the quality of installation and proper co-ordination on the overall performance and maintainability of buildings.

### Learning Outcomes:

*Students will demonstrate their ability to:-*

1. Attend to details in respect of fixtures, fittings and finishes on the performance and maintainability of systems.
2. Be able to properly co-ordinate the installation requirements of the building services equipment, especially with regard to management of sub-contractors work.
3. Understand the various commissioning processes, and the impact on building performance.
4. Understand the importance of maintenance to building services systems and its impact to the life-cycle-cost and methods to devise sound maintenance plans for building services systems.

### Syllabus Content:


Building services engineering system for intelligent buildings: introduction to information transmission systems, communication and protection system, call systems, public address system and Building automation/management systems.

The concepts and importance of energy conservation and energy efficiency for environmental protection, environmental protection and maintenance of building services systems, selection of environmentally friendly products and materials used in building services systems.

Co-ordination and management of design and installation of various building services systems during the design and construction stages in particular the builder’s works.

Computer-aided design and installations of building services.

Testing and commissioning of building services systems: fire safety systems, vertical transportation equipment ventilation systems, etc.

Sick building syndrome.

The impacts of life-cycle-cost on planning and implementation.  
An appreciation of capital and operating costs. Implication of low cost inefficient equipment, poor installation, inadequate access for maintenance.
**Learning and Teaching Approach:**

The subject can be divided into three main parts; introduction to complex building services systems, management and co-ordination of the design and installation of building services systems, and maintenance management for building services systems.

A “case oriented” approach is to be adopted for teaching the subject; A number of up-to-date case studies on building services systems of high-rise buildings are used to illustrate the current state-of-the-art on the design and operation of complex building service systems. Practitioners from the industries will be invited to present lecture on the management of the building services installations and on operation and maintenance of building services systems.

The subject will be delivered through lectures, laboratories and small groups tutorials. The lectures and laboratories aim at introducing theories, concepts and practicals whereas tutorials are for in-depth small group discussions.

**Assessment:**

Examination and coursework will contribute 70% and 30% of the overall mark for the subject respectively. One of the assignments will be in the form of case study; students will be asked to carry out a critical investigation of the building services systems of a building of their choice and to comment on the systems adopted, the installation and integration with other systems. Another assignment will be an essay on the management side of the module.

**Reading List:**

**Recommended:**


Barton P.K. (1983) *Building Services Integration*, E & F.N. Spon

CIBSE (1994) *Building Services Maintenance Management*, CIBSE

**Supplementary:**

