Subject Code: BSE332

FIRE SERVICES

Level: 3

Contact Hours:
Lect/Sem: 28
Tut: 9
Lab: 9

Student Effort Hours: 120

Assessment Method:
Examination 70%
Coursework 30%

Credit Value: 3

Pre-requisites:
BSE222, BSE251 or equivalent

Co-requisites:
Nil

Exclusions:
BSE336

Subject Leader/ Lecturer/Dept. (BSE)

Subject Aim:

This subject is intended to:

1. Provide base knowledge sufficient to enable students to design and appraise fire engineering systems, based on a second understanding of the background concepts.

Learning Outcome:

Students will demonstrate their ability to:

1. Understand and appraise the background behind legislation and codes of practices related to fire services in building.
2. Design and make rational choices of system, materials and equipment based on requirements from local regulations as well as performance from basic fundamentals.
3. Be able to develop in depth studies in fire engineering and research by delivering fundamentals in fire science.

Syllabus Content:

Fundamental Concepts of Fire:
Fire triangle, properties of fuel, fire extinguishing mechanisms.

Legislation:
Local regulations, code of practices, building regulations, legislative issues, role of engineers in fire services.

Fire Control Systems:

Smoke Control Systems:
Fire safety principles in smoke management and in ventilation and air conditioning systems. Pressurisation of staircases and safety zones in hazardous areas, smoke extraction, smoke vents.

Fire Detection and Alarm Systems:
Principles of fire detection and alarm systems, unwanted alarm, interface with other installations and building management.

Fire Resisting Construction:
Properties of material under fire environment, fire resisting period, compartmentation. Means of access and escape.
Learning and Teaching Approach:
The realisation of the aims will be based on lectures, tutorials, assignments, laboratories, directed reading and industrial/site visits. Lectures will be used to introduce various systems and the necessary engineering design knowledge, backed up by films and slides. Tutorials will provide the opportunity for questions and discussions on problems related to lectures, assignments, and case studies. Assignments will emphasise on practical design solutions and performance appreciation. There will be a two-hour test.

Laboratories will develop student ability to understand physical phenomena of fire services and to interpret experimental data with practical design criteria of systems. Laboratory sessions will be jointly organised together with other technical subjects of Stage 2 of the programme. Industrial visits will allow students to appreciate system operation, maintenance and installation.

Assessment:
Based on an examination mark 70% and continuous assessment mark 30%.
The continuous assessment mark is made up from one in class tests, one seminar and laboratory reports.

Reading List:
Recommended:
SEPE Handbook of Fire Protection Engineering (2nd Ed.), NFPA, 1995
Building Regulations, SAR, Hong Kong Government
Manual of Firemanship, HMSO
Rules for Automatic Sprinklers Installations, LPC, 1990
NPFA Standards, ANSI/NFPA
Design of Smoke Management Systems, ASHRAE, 1992

Related Laboratory Work:
Investigation of the sensitivity of a fire detection system
Study of the operating characteristics of a sprinkler/water mist system
Smoke movement

Related Design Work:
Automatic Sprinkler System
Hose Reel/Fire Hydrant Systems
Smoke Extraction Systems
Fire Detection and Alarm Systems