GEOLOGY FOR ENGINEERS

Subject Aim:

This subject is intended to:

1. Provide students with a basic knowledge of geology and Engineering geology and their applications to Civil Engineering.
   The course is an essential preliminary to studies in Soil Mechanics and Foundation Engineering later in the course.

Learning Outcomes:

Students will demonstrate their ability to:-

1. Understand and classify the different nature and properties of different types of rocks.
2. Apply the knowledge to foundation designs and construction.
3. Interpret the test results of the soil samplings.

The Earth (1 week)
Internal structure-plate tectonics - geological time scale.

Geomorphology (2 weeks)
Weathering : mechanical and chemical - the work of sunlight, wind, rain, ice and water in shaping the earth's surface.

Minerals (2 weeks)
Study of physical properties of common minerals and their recognition from hand specimens.

Rocks (2 weeks)
Study of composition, appearance, origin of common rocks and their recognition in hand specimens.

Structural Geology (1 week)
Study of commonly occurring structures seen in the earth's crust - Folding, Faulting, Jointing, Dips, Strikes, Bedding, Unconformities.

Geology of Hong Kong (1.5 weeks)
Study of the rocks and structure of Hong Kong - Field Studies. Comparison of the geology of Hong Kong to that of South China.

Site Investigations (2 weeks)
Methods of investigation - trial pits, probing, boreholes, remote sensing. Sampling - disturbed and undisturbed, cores. In-situ testing. Map reading and mapping

Engineering Geology (2.5 weeks)
Geological applications to tunnels, transportation links, dams, reservoirs, catchments, coastline protection, slopes and foundation.
### Learning and Teaching Approach:
Fundamental knowledge will be covered in lectures. Laboratory work and field studies will help students appreciate the basic principles and familiarize themselves with basic instruments.

### Assessment:
**Coursework:** Two laboratory reports, one field study report and ten tutorial problem sheets.

**Assessment:** 70% examination + 30% coursework

### Reading List:
**Recommended:**

**Essential Textbooks**
- Geotechnology III Study Guide to Geology Volumes, 1, 2, 3.
- Geotechnology IV Study Guide to Engineering geology Volumes 1, 2.

**Reference Textbooks**
- Blyth & De Freitas (Edward Arnold), A Geology for Engineers 7th ed., 1984 - ELBS.