MODULE I
ENGINEERING GEOLOGY

GEOLOGY
- from the Greek word "geo", which means earth, and "logos", which means study
- the study of the materials that make up Earth, the processes that form and change these materials, and the history of the planet and its life-forms since its origin

APPLICATIONS OF GEOLOGY
- Foundation engineering
- Construction materials engineering
- Infrastructure engineering
- Disaster mitigation
- Land-use engineering
- Water resources engineering
- Environmental engineering

BRANCHES OF GEOLOGY
- Historical Geology
- Physical Geology

HISTORICAL GEOLOGY
- Deals with the events that took place all over the world, throughout time. This includes:
    - Palaeontology – the systematic study of past life forms
    - Stratigraphy – study of layered rocks and their interrelationships
    - Paleogeography – study of the locations of ancient land masses and their boundaries
    - Geologic mapping – superimposing of geologic information upon existing topographic maps
- Study of the earth as a historical body to learn about the natural world of prehistory. Information is obtained by reading the rock record. This is accomplished by using principles of geology derived from physical geology.

PHYSICAL GEOLOGY
- An important aspect of physical geology is to understand the landscape in terms of observable processes that shape it. This leads naturally to study of the physical and chemical aspects of Earth's minerals and rocks and the existing composition, distribution and structure of these. Studies include:
    - Minerals
    - Rocks
    - Earth's internal structure
    - Plate tectonics
    - Geologic structures
    - Rock cycle
    - Surface and subsurface processes

REVIEW TERMS

Matter – anything that has volume and mass
Element – a substance that cannot be broken down into simpler substances by physical or chemical means
Atom – the smallest particle of an element consist of protons, neutrons and electrons; it has same number of proton and electron
Nucleus – the center of an atom; it is made up of proton and neutron
Proton – a tiny particle that has mass and a positive electric charge
Neutron – a particle with approximately the same mass as a proton, but is electrically neutral (it has no electric charge)
Electron – has little mass, but has a negative electric charge that is exactly the same magnitude as the positive charge of a proton
Hydrogen – lighest of all atom with only one proton
Atomic number – the number of protons in an atom's nucleus
Isotopes – atoms that have different mass number
Solids – substances with densely packed particles
Liquids – take the shape of its container; has no definite volume
Gas – particles are separated by relatively large distances; no definite volume unless restrained by a container or force such as gravity.
Plasma – hot, highly ionized, electically-conducting gases

FACTS

1. Hydrogen (93.5%) and helium (6.3%) are the most abundant elements in the universe
2. 98.5% of the Earth's crust are made up of:
    a. Oxygen (46.6%)
    b. Silicon (27.7%)
    c. Aluminium (8.1%)
    d. Iron (5%)
    e. Calcium (3.6%)
    f. Sodium (2.8%)
    g. Potassium (2.6%)
    h. Magnesium (2.1%)
    i. Others (1.5%)