

## **E-content module**

**Class:** B. Sc. Semester-I  
**Course Title:** Physical and Structure Geology  
**Course Code:** 1GELTC0101

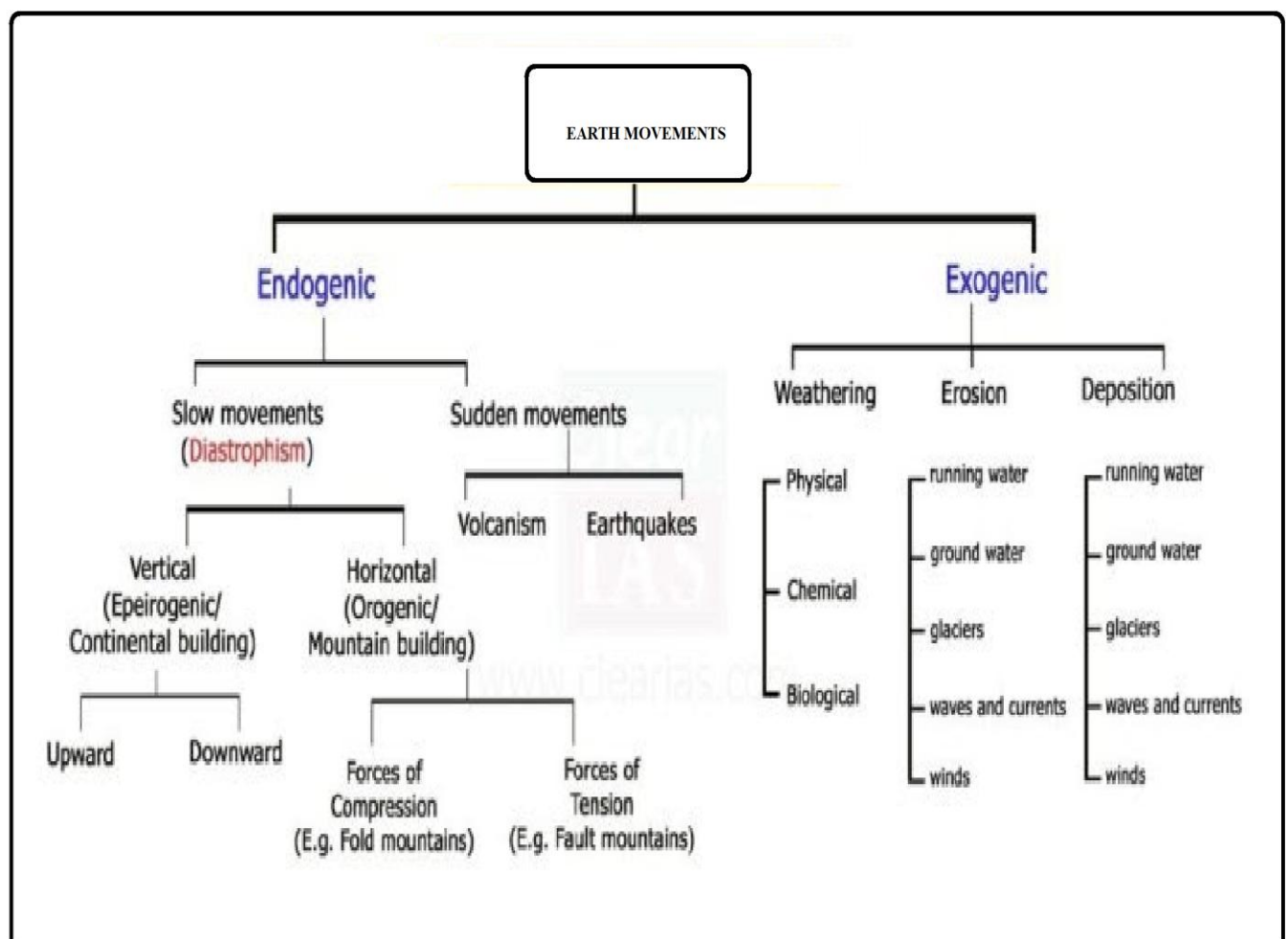
# **UNIT-2**

## ***2.5: Earth movements: Exogenic movements and Endogenic movements. s***

### **CONTENTS:**

- INTRODUCTION
- CLASSIFICATION
- ENDOGENETIC MOVEMENT
- EXOGENIC MOVEMENT

1. **INTRODUCTION:** The face of the earth is constantly being reshaped by **internal forces**, such as earth movements, volcanoes, earthquakes and **external forces**, such as river, rain water, glacier, wind and sea waves. These powerful internal



forces operating from within the crust and external forces/geomorphic processes are called earth movements.

Such movements may be slow and sudden.

## 2. CLASSIFICATION

### **3. ENDOGENIC MOVEMENT**

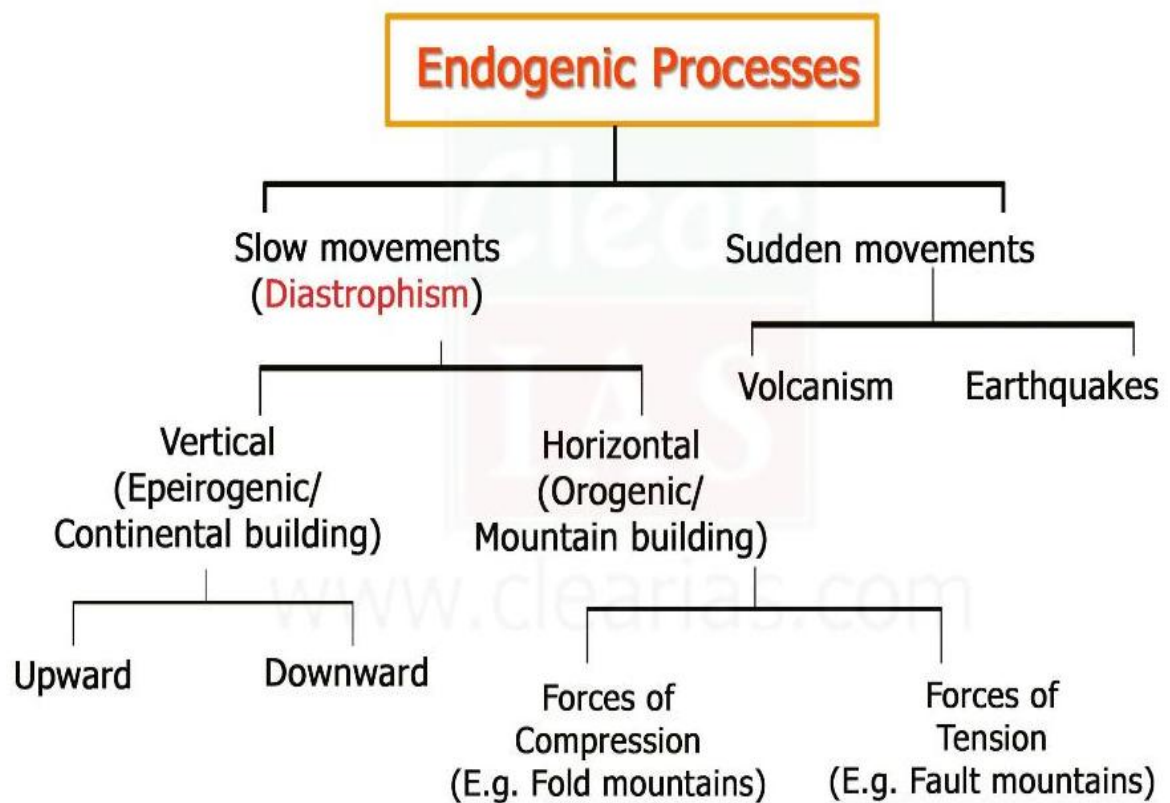
These are also called internal forces as they form, originate and are act in the interior of earth. These are land building forces that play a crucial role in the formation of the earth's crust.

There are two types of movements.

#### **1. Horizontal movement**

#### **2. Vertical Movements**

Horizontal forces acts on the earth's crust from side to side to cause these movements. They are also known as orogenic movements (mountain building). They bring a lot of disruptions to the horizontal layer of strata leading to a large structural deformation of earth's crust. Vertical Movements: Causes rise or a fall of a portion of the earth surface. These movements of the earth do not disturb the horizontality of the strata as they were originally laid down. The internal and external forces causing stresses and chemical action on earth materials and responsible for the earths movements and lot of geomorphic changes.



### **Diastrophic /Constructive forces**

Acts very slowly and effects is seen after million of years. It affect large area of globe, produces meso-level features. (e.g; mountains, planes, plateau and lakes Are two type: Epeirogenic and orogenic .

**Epeirogenic movements:** Caused by Upward and downward movements .Upliftment of whole continents or part of it and upliftment of coastal land of continents by upward movements.

Downward movements cases subsidence of land area. Land area near the sea coast is moved downward or subsidised below sea level (Submergence).


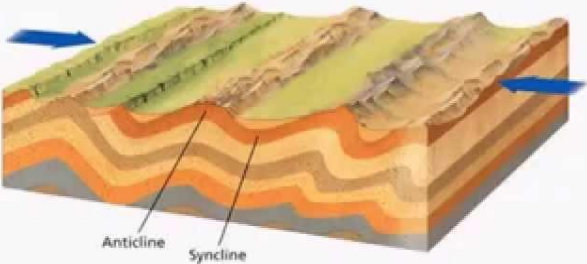
**Orogenic or the mountain-forming movements**

☐ **Tensions produces fissures and compression produces folds**

**EARTH Movements**

### Forces in Earth's Crust

- Over millions of years, the forces of plate movement can change a flat plain into landforms such as anticlines and synclines, folded mountains, fault-block mountains, and plateaus.

[www.poormansfriend.org](http://www.poormansfriend.org)

**Orogenic movements:** These are caused due to horizontal endogenic forces (tangential forces). Horizontal forces acting in the opposite direction are called tensional forces. Caused divergent movements forms ruptures, fractures, faults in the earth's crust. Forces acting face to face called compressional / convergent forces. Causes, folds. Crustal warping and local rise or subsidence.

### **Sudden movements: Volcanism and earthquakes**

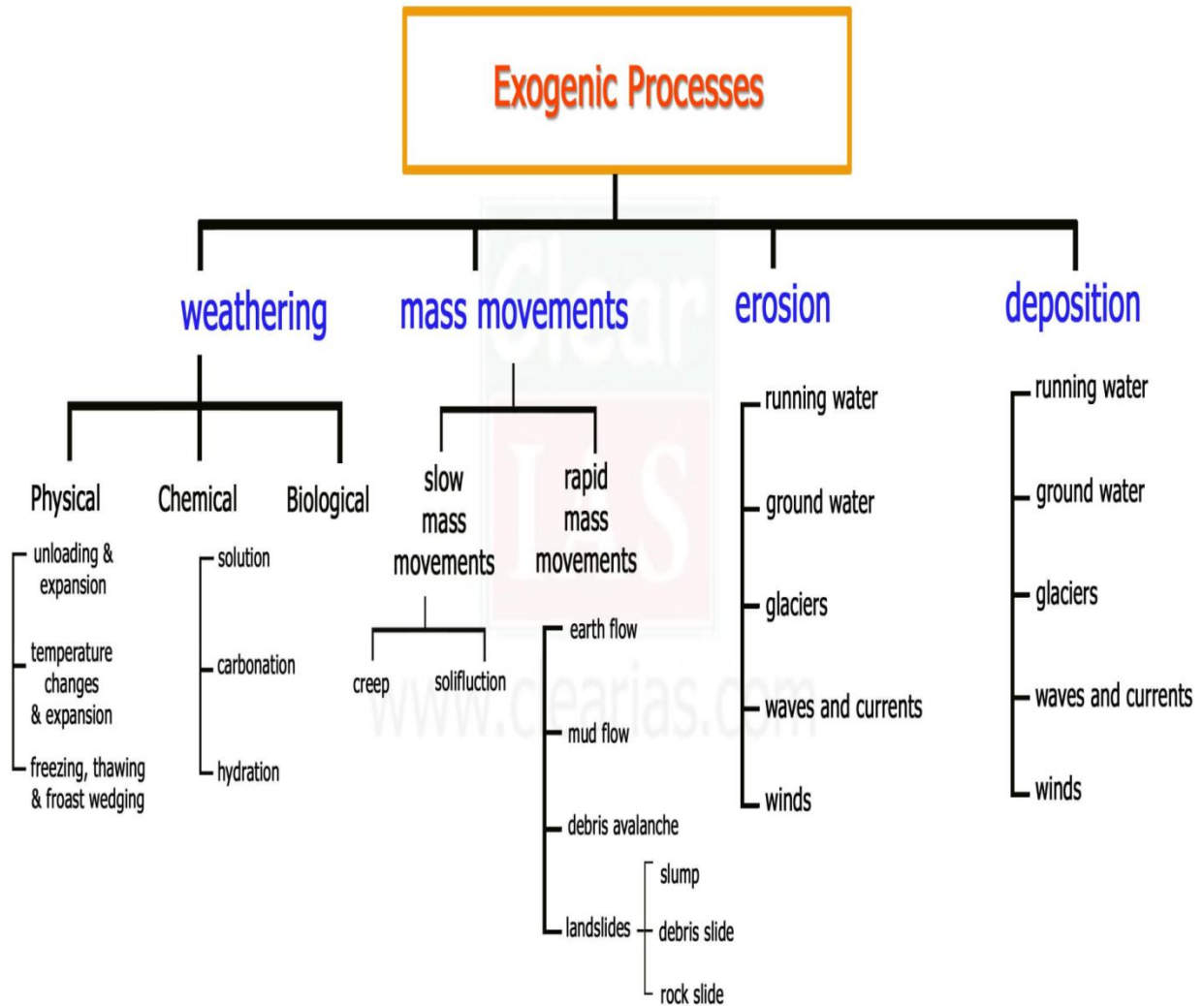
Volcanism a sudden explosive type movement that includes several events

working under crust. It brings lot of crustal changes.

**Earthquakes:** Sudden shaking of the earth surface by the pressure build and release from inside the earth. Earthquakes are caused by sudden tectonic movements in the Earth's crust. The main cause is that when tectonic plates, one rides over the other, causing orogeny collide (mountain building), earthquakes.

#### **4. Exogenic Movement**

Exogenic Geomorphic Movements on the earth's crust or its surface brought down by the forces originated from above the earth's surface (wind, water, glaciers, plants) are called exogenic geomorphic process. Exogenic geomorphic process gives rise to exogenic geomorphic movements such as weathering and erosion. The effects of most of the exogenic geomorphic processes are small and slow but will, in the long run, affect the rocks severely.



### **Weathering and erosion phenomenon:**

In-situ physical break down and chemical decomposition of the rocks. If transportation involves then called Erosion.

### **Mass wasting**

Slow down slope movement of rock material and soil under the influence of gravity. It is a natural phenomenon.

**Earth Flow:** Down slope movement of viscous fine grained material saturated with and move due to gravity.

**Mud Flow :** Rapid to extremely rapid surging flow of debris saturated with water

**Landslide:** Rapid movements: Significant among all type of mass movements. Slides involve both down slope displacement of weathered rock material and soils.

**Debries slide:** Extensive and large scale movement of unconsolidated material with little water.

### **Slow movements**

**Creep:** very slow down slope movement of material. Includes soil creep and rock creep.

Debries movement in the periglacial regions by freezing activity is called **solifluction**. Slow movement of debries soaked with water.

**Rock slide:** Rapid large rock blocks slide down the hill slope where there is large relief.

**Slump:** Sliding of rock fragments, rock blocks or soils downslope.

### **EROSION**

Erosion is the dynamic activity of erosive agent such as **water flow**, movement of **snow, wind action, plants and animals** that removes soil, rock, or dissolved material from one location on the Earth's crust, and then transports it to another.



Eroded sediment or solutes may be transported just a few millimetres, or for thousands of kilometres.

Wind erosion is a natural process where the soil is moved, carried, and transported by the force of the wind from one place to another.

**Wave-current:** cause the coastal erosion. The current leads to an increase in shear stress at the lateral bank giving rise to erosion and transportation of sediments.

**Groundwater:** also can cause erosion under the surface. Water flows through the soil and form acid which dissolved minerals. Minerals carried by groundwater get deposited in other places.

**Animals:** over grazing eat up a large amount of vegetation and plantation which leads to **erosion**. Muskrat is an **animal** known to burrow holes near the banks of rivers and in the process makes the river banks weaker.

### **Deposition as exogenic process**

Deposition is the geological process in which sediments, soil and rocks are added to a landform or land mass.

Deposition by Wind

Deposition by ice

Deposition by water

Gravity transport previously weathered surface material, and deposited them to build up layers of sediment.

## **5. SUGGESTED READINGS**

1. <https://gyanhunger.com/earth-movements>.
2. <https://www.pmfias.com/earth-movements-endogenic-geomorphic-movements>
3. [https://link.springer.com/referenceworkentry/10.1007/1-4020-3880-1\\_132](https://link.springer.com/referenceworkentry/10.1007/1-4020-3880-1_132)

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