

Structural Geology.. Its Definition and Important

Definition of structural geology:

Flowchart shown in Figure (1) shows the branches of structural geology and that is one of the branches of geology, interested in studying earth secondary structures resulting from exposure lithosphere rocks to the process of deformation due to tectonic forces and non-tectonic.

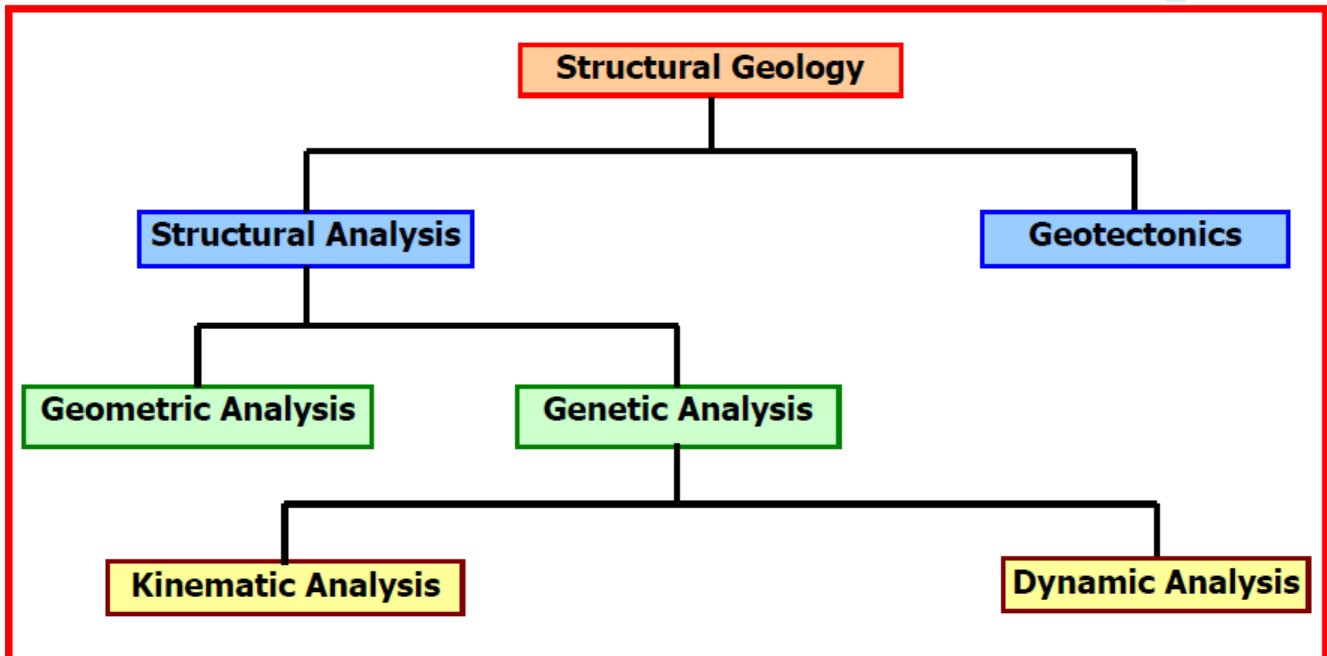


Figure (1) Flowchart shows branches structural geology

1. Structural analysis

It is one of the branches of Structural Geology, who is interested in studying earth engineering structures and genetic so it divide to geometric analysis and genetic analysis.

- (a) Geometric analysis : Includes direct measurements of the physical characteristics of the rock body, and thus determine the type of structure and engineering dimensions.
- (b) Genetic analysis : Includes two types of analysis, kinematic analysis and dynamic analysis
 - Kinematic analysis: It explained how to get the process of deformation in the body rock, it is interesting in studying **strain**.
 - Dynamic analysis : aim of this analysis is to rebuild the force that caused the body rock deformation, it is interesting in studying **Stress**.

2. Geotectonic

It's a branch of structural geology, it's interested in studying the origin and development of the regions and structures and geological phenomena found within the earth's lithosphere as well as the nature and causes of the causative forces. There are many theories that attempt to explain the structures in the earth's crust or lithosphere, the most prominent of these theories are:

- 1- Contraction theory.
- 2- Geosynclines theory.
- 3- Continental drift theory.
- 4- Thermal convection currents.
- 5- Sea floor spreading.
- 6- Plate tectonics theory.

First and second theories are no useful today, and they are considered part of the geological history of scientific knowledge. The theories third, fourth and fifth have been collected together and have added many of the new knowledge to arise theory sixth, which is most cellular theory today in the scientific community.

Geological Structures

Geological structures are geometric patterns of rocks can determine the dimensions and forms and distribution. Depending on the reasons for their formed is divided into two basic types (Figure 2):

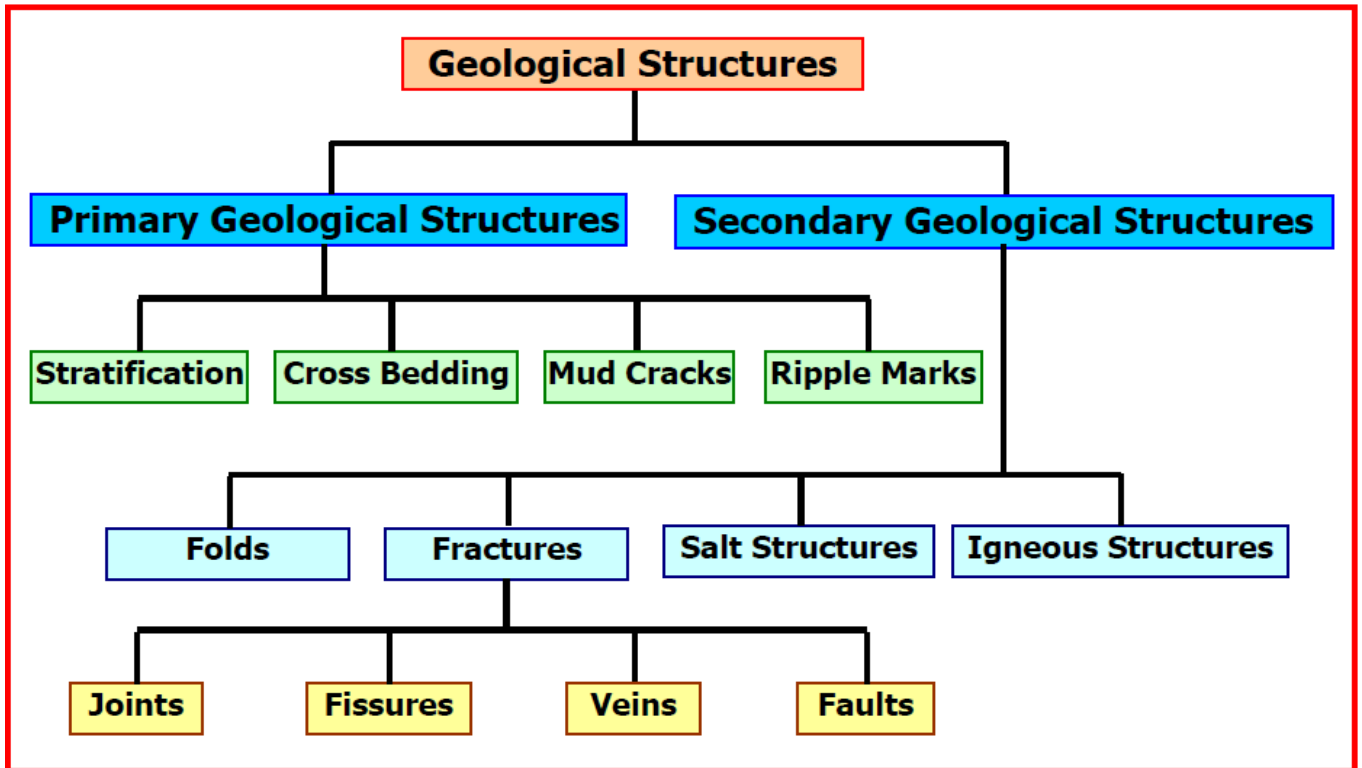


Figure (2) Flowchart shows geological subdivisions of primary and secondary

Primary geological structures

It geological structures formed during the deposition process, they formed as a result of the reasons for non-tectonic for examples: Stratification or Bedding, Cross Bedding, Mud Cracks and Ripple Marks. These primary structures did not studying in structural geology.

Secondary Geological Structures

It geological structures that formed after the completion of the deposition, they consist as a result of tectonic reasons for examples: Folds, Fractures including [Joins, Fissures, Veins and Faults], Salt Structures and Igneous Structures. These secondary structures are interested in studying structural geology.

Importance of structural geology:

The structural geology two branches structural analysis and geotectonic important in all of Geological Sciences, but here suffice mention some the most obvious examples:

1. Engineering Geology: the establish of engineering structures take study the structure of the foundation rock of great importance especially when the construction of dams and tunnels, where you must take fractures and trends into account.
2. Petroleum Geology: many oil traps represent structural manifestations (folds or faults).
3. Economic Geology: The evaluation of economic importance to the ore or the rocky body such as coal or limestone is by selecting structural dimensions and place it.
4. Hydrogeology: Linking water reservoirs existence of geological structures fractures and folds.