

Geology II (GEO 158) Tribhuvan University
Soch College of Information Technology
Bachelor of Science in Computer Science and Information Technology

Course Title: Geology II

Course no: GEO-158 ----- Full Marks: 60+20+20

Credit hours: 3 ----- Pass Marks: 24+8+8

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

Course Synopsis: Fundamental concepts of contemporary earth and environmental science and engineering with increasing computer application.

Goal: It aims at providing students with the knowledge Earth and environmental science and engineering

Course Contents:

Unit 1.----- 11 Hrs.

1.1 Bed load transport: mechanics and database structures.

1.2 Surface run-off: patterns and database structures

Unit 2.----- 11 Hrs.

2.1 hill slope stability: mechanics, Finite Difference Method and Finite Element Method analysis

2.2 Underground excavation: roof control and database structures

Unit 3. ----- 11 Hrs.

3.1 Groundwater flow: aquifers, flow modeling and exploitation of groundwater.

3.2 Stream flow: hydrographs, time series and flood forecast techniques.

Unit 4.-----12 Hrs.

4.1 Sediment routings; reservoir sedimentation mechanisms and routing.

4.2 Hydrological routing: reservoir and channel routing

4.3 Universal soil Loss Equation (USLE); Components, calculations and conclusions.

Laboratory projects:

Mineral / Rock identification, Soil types, Reserve calculation, Slope stability calculation, Rock Mass Ratings, ER Mapper, ArcView, ILWIS tour, RS data analysis, Digitization, practice and Geographic locking, GIS Layers shows and illustrations, GIS assignment with digital RS data.

Practical

- To calculate the stream power of bed-load transport.
- To calculate soil erosion using universal soil loss equation (USLE).
- To calculate the roof control for an underground excavation.
- To calculate ground water flow from aquifer data.
- To calculate flood forecast form stream flow data.
- To calculate sediment routing parameters for a reservoir.
- To calculate channel routing from stream flow data.

- To design a groundwater well.
- To perform Finite difference method (FDM) analysis for slope stability (software based).
- To perform Finite Elements Method (FEM) analysis for slope stability (Software based).

Text Books: No specific text book covering all materials but a working manual could be easily prepared.