

AG-205: STRUCTURAL GEOLOGY

(03 Credit hrs)

Prerequisite: AG-104

Learning Outcomes

This course is designed to acquire the knowledge about the deformational structures and their kinematics in the crust. This will help in understanding the deformational mechanism of various types of rocks and the mapping of resultant structures.

Course Contents

Stress: concepts, classes, ellipsoid, Mohr circle of stress. Strain: concept, measures of strain, classes, ellipse and ellipsoid, stress-strain diagram. Factors, which control the mechanical behavior of materials. Folds: morphology, classification based on morphology, geometry, vergence and mechanics of fold formation. Faults: terminology, slip and separation, geometrical and genetic classification and recognition of faults. Structures in compressional and extensional regimes, transform faults and fault mechanics. Joints: terminology, geometry and classification. Foliation: terminology, classification and relationship with bedding. Lineation: terminology and classification. Unconformity: concept, classification and recognition.

Lab.

Map exercises and construction of geological and balanced cross-sections. Orthographic projections (geometrical exercises): dimension calculations. Introduction to stereographic projections: plotting a plane, a line on a plane. Determining of the rake of a line: plunge and bearing from rake. True and apparent dip. Determining the intersection of two planes. Pole to a plane; angles between lines and planes.

TEACHING – LEARNING STRATEGIES

- Lecture based examination
- Presentation/seminars
- Class discussion
- Quizzes

ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR

It is continuous assessment. The weightage of Assignments will be 25% before and after midterm assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.

ASSESSMENT AND EXAMINATIONS

Sr. No.	Elements	Weightage	Details
1.	Mid Term Assessment	35%	It takes place at the mid-point of the semester
2.	Formative Assessment	25%	It is continuous assessment. It includes: classroom participation, attendance, assignments and presentation, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3.	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

Books Recommended

1. Foundation of structural Geology by Park, R.G., 1983, Blackie.
2. Structural Geology of Rocks and Regions by Davis, G.H. & Reynolds, S.J. 1996, John Wiley & Sons.
3. Laboratory Exercise Book in Structural Geology by Ghauri, A.K., 1989, National Centre of Excellence in Geology, University of Peshawar.
4. An Introduction to Geological Structures and Maps by Bennisen, G.M., 1975, Edward Arnold.
5. Structural Geology by Twiss, R.J. & Moores, E.M., 1995, W.H Freeman & Co.