

**CENTRAL UNIVERSITY OF KERALA
DEPARTMENT OF GEOLOGY
M.Sc. GEOLOGY**

Course Code	EGE 5102	Semester	I
Course Title	Structural Geology		
Credits	3	Type	Core

This is a problem solving and employability based Geotechnical skill development course

Course Description

Structural geology is the study of deformation and deformed structures on earth surface. It will explain the complex deformational history of earth structures in terms of various spatial and chronological units at different scale. Understanding on present day geological structure will provide a clue towards the past geological event, which modified our earth in geological time.

Course Outcome

By the end of the course, students are expected to be able to:

- identify the geological structures in both macroscopic and microscopic scale.
- describe the deformational structures of an area from the geologic maps and outcrop patterns.
- elucidate the deformation history of an area using rock fabrics and geometric relationships
- get a proper enlightenment towards the geological literature

Course Structure

Module - 1

Deformation-concept, component and type. Continuum mechanics and rheology. Elastic, plastic and brittle deformation. Concept of stress. Concept of strain. Stress and strain ellipsoids. Mohr circles. Rock failure. Mohr-Coulomb failure criteria. Faults, Joints and Fractures.

Module - 2

Mechanics of folding and Buckling. Biot-Ramberg theory of buckling. Folds - Geometry of cylindrical, non-cylindrical and conical folds. Fold classifications -Donath and Parker and Ramsay. Fold interference and Superposed folding.

Module - 3

Fabric- Planar and linear fabrics. Tectonites- classification. Foliation -types, classification and origin. Lineation - types, classification and origin. Stereographic projections in structural geology. π and β diagrams. Geometric analysis of geological structures on macroscopic scale. Petrofabrics.

Evaluation & Grading

Lab Assessment – 10%

Field Assessment – 10%

Skill development (Analytical, Writing and Presentation) – 10%

Class Test – 10%

End Semester Assessment – 60%

References

1. Billings, M. P. (2016) Structural Geology. Pearson Education; Third edition, 624p.

2. Park, R.G. (1989), *Foundation of Structural Geology*, Blackie, 148p.
3. Ragan, D.M. (1969), *Structural Geology*, Wiley, 2nd edition, 602p.
4. Turner, E.J. and Weiss, L.E. (1963), *Structural Analysis of Metamorphic Tectonites*, Mc. Graw Hill, 545p.
5. Hobbs, B.E., Means, W.D. and William, P.F. (1976), *An outline of Structural Geology*, John Wiley and Sons, 571p.
6. Robert. J.Twiss and Eldridge.M.Moores (2007). *Structural Geology*, W.H.Freeman and Company, 695p.
7. Ramsay, J.G. (1967) *Folding and Fracturing of Rocks*. Mc Graw Hill, 586p.
8. Ramsay, J.G. and Huber M.I. (1987) *The Techniques of Modern Structural Geology: Folds and Fractures*, Academic Press, 391p.