



STRUCTURAL GEOLOGY

PROF. SANTANU MISRA

Department of Earth Sciences

IIT Kanpur

PRE-REQUISITES : Basic Math/Physics and some knowledge of Geological/Earth Sciences

INTENDED AUDIENCE : UG

INDUSTRIES APPLICABLE TO : Construction Industry / Hydrocarbon Exploration and Mining Industries

COURSE OUTLINE :

The subject STRUCTURAL GEOLOGY deals with the shape (geometry), displacements (kinematics/strain) and forces (dynamics/stress) in Earth and Planetary bodies. In other words, the subject deals with the deformation of rocks – their architecture and development through geological time scales. Deformed rocks and structures conceal a series of tales, decoding of which is the challenge of a structural geologist in presenting the evolution of our planet earth. The knowledge of structural geology is applied in many practical fields e.g., hydrocarbon, mineral and groundwater explorations, construction industries, natural hazard analysis, landscape evolution etc.

ABOUT INSTRUCTOR :

Prof. Santanu Misra is a Professor of Structural Geology in the Department of Earth Sciences of Indian Institute of Technology, Kanpur. He is also a DST Swarna Jayanti Fellow, PK Kelkar Research Fellow and INSA Young Scientist. He teaches Structural Geology and leads the Experimental Rock Deformation Laboratory in IIT Kanpur. His main research focus is to understand the mechanical response of composite rock systems at various deformation conditions.

COURSE PLAN :

Week 1: Introduction, Basic Concepts

Week 2: Structural Elements, Measurements, Sterographic Projection

Week 3: Concept of Strain

Week 4: Concept of Stress

Week 5: Rheology of Rocks

Week 6: Deformation Mechanism of Rocks

Week 7: Foliation and Lineation

Week 8: Folds and mechanisms; Superposition of folds

Week 9: Boudinage and related structures

Week 10: Fractures, Joints and Faults

Week 11: Ductile Shear Zone

Week 12: Structural Mapping, Summary and Final Discussion