

#### MAIN OBJECTIVES

To introduce the basic tenets of structural geology.

#### KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Knowledge and understanding of the basic tenets of structural geology and its relationship with plate tectonics

#### COGNITIVE SKILLS

The student will develop an understanding of hypothesis development and be given examples of how these might be tested. This will involve analysis of databases, theoretical understanding of relevant concepts, critical assessment of results and outcomes and experience of real situations reported in recent research papers. They will be encouraged to think about the 3-dimensional aspect of geological structures through use of stereographic projection and map interpretation techniques.

#### SUBJECT-SPECIFIC PRACTICAL/ PROFESSIONAL SKILLS

The student will be made aware of relevant databases and how they might be used in studies of geology and geophysics. They will be trained to read and interpret geological maps. They will be able to plot structural orientation data on stereographic projections to aid 3D visualisation. They will use CD-based lecture notes and course material.

#### GENERAL/ TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

The student will gain skills such as writing, comprehension of scientific data and papers, mathematical calculation, manipulation of data using relevant software/ research techniques, independent study, IT skills and confidence in their abilities to follow a problem through to its end. They will be accomplished at map reading/ interpretation and 3D visualisation. They will learn to use an electronic library.

#### PREREQUISITES

A pass in A-level Geology (or equivalent), or 0001 Introduction to Geology.

#### CONTENT AND ORGANISATION

1. The plate tectonic setting of structures and deformation.
2. Characteristics of tectonic structures: a review of the main features of faults, shear zones, folds, foliations, lineations and deformation fabrics.
3. Formation of tectonic structures: a review of deformation mechanisms and the nature of stress and strain.
4. Structural associations: the geometry and kinematics of thrust, normal and strike-slip fault systems. The development of poly-phase structures.

Practical work will include structural interpretation of maps and cross-sections, the representation of structures using stereographic projections and the techniques of field structural geology.

#### ESSENTIAL TEXT

McClay, K. 1987. The mapping of geological structures. Open University Press.

#### RECOMMENDED READING

Davis, G.H. and Reynolds, S.J. 1996. Structural Geology of Rocks and Regions. 2nd edition. John Wiley & Son

#### FIELDWORK

None.

#### COURSE-UNIT EXAMINATION

One 3 hour theory paper and one 3-hour practical paper.

#### TIMETABLE

Wednesdays, weeks 12-22 & 25-26; all years. Normally taken in 2nd year.

#### REQUIREMENTS FOR FIELDWORK

None

#### LECTURERS

Joanna Faure Walker and Gerald Roberts