

Sedimentology & Structural Geology

1.1 Course Number: PE323

1.2 Contact Hours: 3-0-0 Credits: 9

1.3 Semester-offered: 3rd Year-Even

1.4 Prerequisite: Knowledge of the Petroleum Engineering Practice and Petroleum Geology

1.5 Syllabus Committee Member: Dr. Satish Kumar Sharma

2. Objective:

- To impart knowledge about the sedimentary rock and their importance in petroleum system
- To impart knowledge about Deformational structure of the earth and their importance in petroleum system.

3. Course Content:

Unit-wise distribution of content and number of lectures

Unit	Topics	Sub-topic	Lectures
1	Process of Sedimentation and Classification of Sedimentary rocks	History of Sedimentology, Processes of sedimentation (Erosion/ Weathering, Transportation and Deposition), Lithification & Diagenesis, Mineralogical characteristics and Classification of rudaceous, arenaceous, argillaceous and calcareous rocks; Petrographic details of important siliciclastic and carbonate rocks	10
2	Texture & Structure of Sedimentary rocks and depositional environments	Textural properties of sedimentary rocks (Size, Shape fabric, orientation etc.) Pore morphology and its significance Structures of sedimentary rocks (Mechanical, Chemical and Biological Structure; Brief description of Dispositional environments; Field Investigation in Sedimentology	10
3	Structure, Topography, Unconformities and joints	Topography and its representation; Concept of rock deformation; Dip and strike; Outcrop, effects of topography on outcrop, Overlap; Outlier and inlier, Planar and Linear structures. Unconformities: Definition, How it forms, Description, Classification, Geological significance and recognition of unconformities in the field Joints: Origin of Joints, Nature, Attitude of joints, Classification of Joints, Occurrence of Joints, Importance of joints in petroleum system.	10

4	Fold and Fault	<p>Fold: Parts of fold, Classification of Folds, Mode of Occurrence of folds, mechanics and causes of folding, Importance of fold in petroleum system</p> <p>Faults: Fault Terminology, Classification of Faults, Effects of faulting on the outcrops, Recognition of Faulting in field, Causes of Faulting, Engineering Considerations of Faults, Importance of fault in petroleum system.</p>	10
Total			40

4. Readings : Journals and magazines related with sedimentology & structural geology and upstream hydrocarbon industry

4.1 Textbook:

- Principles of Sedimentology & Stratigraphy- Mercil PC & Sam Boggs Jr
- Applied Sedimentology- Shelly R C
- Sedimentary Rocks - Pettijoan F.J.
- Structural Geology - Billings MP
- Foundation of Structural Geology- Park, R.G
 - An outline of Structural Geology- Rubbs, Mears and William

4.2 Reference books:

- Principles of Sedimentology by Friedman, M.Gorale & Sanders
- Sedimentary Structures by Collinson& Thompson
- Sand and Sandstone by Pettijoan & Potter
- Structural Geology: Fundamentals & Modern Developments by S. K. Ghosh
- An Outline of Structural Geology by Hobbs & William
- Folding and fracturing of Rocks by ramsey
- Structure and Tectonics by Bagley

5 Outcome of the Course: After completion of the course, the students will be able to:

- Learn about the process of formation of the sedimentary rock
- Understand the impact of textural properties on reservoir characteristics
- Learn that how the unconformities and fault can be identified in the field
- Understand the importance of the fold, fault, unconformities and joints in petroleum system