



Iran section

## **SPE-Iran Section Technical Workshop**

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# **Sedimentology of Petroleum Reservoir**

### **INTRODUCTION**

This course introduces the principles of sedimentology, diagenesis and hydrocarbon systems as applied for clastic and carbonate rocks. The main course focus is on the classification schemes and nomenclature of texture and porosity types; the processes of sedimentation and their products in different depositional environments and postdepositional modification. Carbonate and clastic basics of sequence stratigraphy will also be covered in this course.

This course is aimed at geoscientists, reservoir engineers and petroleum engineers who require an understanding of reservoir rocks depositional systems and diagenesis.

### **BENEFITS OF ATTENDING**

Understand reservoir rocks depositional systems Learn the process of sediment formation and accumulation Able to analyse the sedimentology of clastic and carbonate rocks Know how to interpret reservoir facies and diagenetic changes Can compare various reservoir types Know the different schemes to classify reservoir rocks types

### **COURSE CONTENT**

#### **CLASTIC SEDIMENTOLOGY**

- Introduction

Introduction to clastic sediments, grain texture Principles of hydrodynamics, Bedforms, sedimentary structures,

- Clastic Rocks Classification

Discussion about popular classifications for clastic rocks

- **Depositional Environments**

Major sedimentary processes; Bedload shapes, major texture types and Indicative features for:

- Alluvial fans,
  - Fluvial environments,
  - Deltaic environments
  - Shallow Marine Environments
  - Deep Marine Environments
- Basic Concepts of clastic sequence stratigraphy

Controls on sedimentary depositional systems, accommodation space, sediment supply, sea-level change, transgression and regressions, parasequences in the Shallow Marine environment

Sequence stratigraphy of marginal and non-marine systems

Base level and fluvial response to base level change, Sequence boundaries and systems tracts in the non-marine, parasequences in the non-marine, channel geometries and connectivity

- **Clastic rocks Diagenesis**

Digenetic environment, diagenetic processes including physical and chemical compactions, cementation, dissolution and clay precipitation.

- Pore systems in sandstone

Definition of different types of porosity in sandstone, pore network modelling and control of porosity and permeability.

## **CARBONATE SEDIMENTOLOGY**

- **Introduction**

Characteristic of carbonate facies and controls on their deposition

- **Carbonates Rock Properties**

Texture

Composition

Sedimentary Structures

- **Carbonate Components**

Non-skeletal and skeletal components of limestones; criteria for their identification and environmental significance

- **Carbonate Rocks Classification**

Review of common carbonate classification schemes;

- **Depositional Environments, Facies and Depositional Systems of Carbonates**

Typical sedimentary textures and structures and their significance for interpreting sedimentary environmental

- **Carbonate Diagenesis**

Diagenetic environments; Major Diagenetic Processes, Sediment Compaction, Cement Precipitation, Dissolution of Carbonates, Dolomitization Controls on carbonate diagenesis; Porosity development/modification

- **Carbonate Pore Classification**

- Porosity in carbonates
- Porosity Classifications
- The Archie Classification
- The Choquette–Pray Classification
- The Lucia Classification

- **Hydrocarbon Systems in Carbonates**

Carbonate Sand Plays, Organic Buildup Plays, Muddy Dolomite / Chalky Limestone Plays.

## Who Should Attend

This course is specially designed for:

- Geophysicists
- Reservoir engineers
- Geologists
- Petroleum engineers
- Petrophysicists

