

# AMDE12 RESERVOIR ENGINEERING-I

## UNIT-1 INTRODUCTION TO RESERVOIR ENGINEERING, BASIC PRINCIPLES, DEFINITIONS AND DATA

- 1.1 Reservoir fluids, oil, gas, Gas formation volume factor, oil formation,
- 1.2 Volume factor, water formation volume factor- oil, gas water, rock compressibility
- 1.3 Resistivity index, wettability and contact angle,
- 1.4 Effective permeability characteristics, capillary pressure curves
- 1.5 Resistivity factors and saturation exponents.
- 1.6 Fluid PVT Analysis and oil gas phase behaviour.

## UNIT-2 FORMATION EVALUATION

- 1.1 General material balance equations in oil or combination reservoirs, predicting primary recovery in solution- Gas Drive, Reservoirs.
- 1.2 Definition and classification of Reserves- methods of estimating Reserves- Production decline curves.
- 1.3 Secondary Recovery- pressure maintenance- gas injection- water injection- spacing of wells and well patterns- peripheral or central flooding.

## UNIT-3 FLUID FLOW IN RESERVOIRS, FLUID MOVEMENT IN WATER FLOODED RESERVOIRS

- 3.1 Recovery efficiency- Areal or pattern.
- 3.2 Sweep efficiency, Vertical or invasion sweep efficiency,
- 3.3 Permeability variation- Cross flow- Estimates of volumetric sweep efficiency
- 3.4 Estimation of water flood recovery by material balance- prediction methods
- 3.5 Monitoring infectivity.
- 3.6 Darcy Law and application.

## UNIT-4 RECOMMENDED METHODS FOR ASSESSING RESIDUAL OIL

- 4.1 Existing wells, new wells, Chemical Flooding,
- 4.2 Gas injection, Thermal recovery- Well Testing.

## UNIT-5 WELL INFLOW EQUATIONS FOR STABILIZED FLOW CONDITIONS.

- 4.1 Constant terminal rate solution of the radial diffusivity equation and its application to oil well testing.

### References Books:

1. Dake, L.P. Practice of Reservoir Engineering Elsevier 2001
2. William C.Lyons, Gary J.Plisga “Standard Hand Book of Petroleum & Natural Gas Engineering” Second Edition – (Elsevier), Gulf Publishing, Burlington U.S.A (2005).