

RESERVOIR ENGINEERING

MODULE I

Introduction to Reservoir Engineering, Basic principles, definitions and data – Reservoir fluids, oil, gas, Gas formation volume factor, oil formation, volume factor, water formation volume factor – oil, gas water, rock compressibility – Resistivity index, wettability and contact angle, effective permeability characteristics, capillary pressure curves – Resistivity factors and saturation exponents. Fluid PVT analysis and oil gas phase behaviour.

MODULE II

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

MODULE III

Fluid flow in reservoirs, Fluid movement in water flooded Reservoirs – Recovery efficiency Areal or pattern. Sweep efficiency, - Vertical or invasion sweep efficiency, - Permeability variation – Cross flow – Estimates of volumetric sweep efficiency – Estimation of water flood recovery by material balance – prediction methods – Monitoring injectivity. Darcy Law and application.

MODULE IV

Recommended methods for assessing residual oil – Existing wells, new wells, Chemical Flooding, Gas injection, Thermal recovery – Well Testing. Well inflow equations for stabilized flow conditions. Constant terminal rate solution of the radial diffusivity equation and its application to oil well testing.

TEXT BOOKS:

- L.P.Dake Elsevier, “Fundamentals of Reservoir Engineering”, Development in Petroleum Science. 1980
- Craft B.C and Hawkins M.F. – Applied Petroleum Reservoir Engineering” 2nd Edition. Prentice Hall Englewood Cliffs, N.J., 1991
- Amar kumar ,“Reservoir Engineering Handbook”, SBS Publishers; UK ed. edition (1 February 2012)

REFERENCES:

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