

## **SEMESTER #2**

### **PE6031 Reservoir Simulation**

#### **Course Content:**

Derivation of Partial Differential Equations Governing Single and Multi-Phase Fluid Flow Through Petroleum Reservoirs; Conceptual, Mathematical and Numerical Modelling Principles; introduction to Elliptic, Parabolic and Hyperbolic Partial Differential Equations; introduction to Finite Difference Techniques; introducing Numerical Modelling Concepts on thermal/Microbial Enhanced Oil Recovery Techniques; Fluid Flow Through Fractured/Shale-Gas/Coal-Bed-Methane Reservoirs Using Dual-Porosity approach

#### **Text Books:**

1. **Zhangxin Chen**. Reservoir Simulation: Mathematical Techniques in Oil Recovery, Society for industrial and applied Mathematics, 2008.
2. **Abou-Kassem, J. H., Farouq Ali, S. M., and Islam, M. R.** Petroleum Reservoir Simulation: a Basic approach, Gulf Publishing Company, 2006.
3. **Fanchi John R.** Principles of applied Reservoir Simulation, Gulf Professional Publishing, 2005.
4. **Carlson, M. R.**, Practical Reservoir Simulation: Using, assessing, and Developing Results, Pennwell Books, 2003.

#### **Reference Books:**

1. **Mattax, C.C. and Kyte, R.L.** Reservoir Simulation, Monograph Series, SPE, Richardson, Tx., 1990.
2. **Ertekin, abou-Kassem and King.** Basic applied Reservoir Simulation, SPE Textbook 7, 2001.
3. **Mattax, C. C. and Dalton, R. L.** Reservoir Simulation, Spe Monograph, 1990.
4. **Armin Iske, and Trygve Randen** (Editors). Mathematical Methods and Modelling in Hydrocarbon Exploration and Production, Part III. Springer, 2004

#### **Prerequisite:**

Reservoir Engineering