

Integrated Reservoir Studies

- 1.1 Course Number: PE441
- 1.2 Contact Hours: 3-0-0 Credits: 9
- 1.3 Semester-offered: 4th Year-Odd
- 1.4 Prerequisite: Petroleum Geology / Formation Evaluation / Reservoir Engineering / Production Engineering
- 1.5 Syllabus Committee Member: Dr. Satish Kumar Sinha
2. **Objective:** This course is designed for those students who are interested in data integration for reservoir characterization. In this course, students will be using geological, geophysical and reservoir engineering software for static and dynamic model building. Further, they will simulate the model for production forecast and economic evaluation.
3. **Course Content:**

Unit-wise distribution of content and number of lectures

Unit	Topics	Sub-topic	Lectures
1	Geological Model Building	Integrating the information, Accuracy, Precision and Complexity, Structural framework: plate tectonic model, stresses, traps, folds, faults and fractures Stratigraphic framework: well log correlation, building cross section Scale and resolution of data, Static Modeling	10
2	Geophysical and Petrophysical Model	Reservoir facies modeling, depositional systems, flow units, petrophysical property modeling, well to seismic tie, seismic interpretation and prediction of reservoir properties	10
3	Reservoir Model	Deterministic and probabilistic volumetrics, Dynamic reservoir modeling: upscaling, calibration, simulation, history matching.	10
4	Economic Analysis	Performance forecast, economic evaluation, decision trees, sensitivity analysis	10
		Total	40

4. Readings

4.1 Textbook:

1. Baker, R.O., Yarranton, H.W., and Jensen, J.L. 2015, Practical Reservoir Engineering and Characterization, Gulf Publishing
2. Cosentino, Luca, 2001, Integrated Reservoir Studies, Technip

4.2 Reference books:

1. Journals from the American Association of Petroleum Geologists
2. Journals from the Society of Exploration Geophysicists
3. Journals from the Society of Petroleum Engineers

5 Outcome of the Course:

- Use different software for reservoir characterization
- Analyze, interpret and integrate different data for building static and dynamic model of a reservoir
- Understanding of flow units in a reservoir
- Assess the economics of oil and gas projects