

Course Type	Course Code	Name of Course	L	T	P	Credit
DC8	PEC301	Applied Reservoir Engineering and Management	3	0	0	9

Course Objective

The objective of the course is to present the advanced knowledge of Petroleum Reservoir Engineering, with an emphasis on how to apply the acquired knowledge in the oilfield

Learning Outcomes

Upon successful completion of this course, students will:
 have an overview and scope of the subject, the application of forms of MBE, the drive mechanisms and related production behaviour of the reservoir, various techniques of performance prediction.
 to be able to learn the principle of pressure maintenance, theory of immiscible displacement and application to water flooding operations, learn to calculate water flooding performance, principle and applications of integrated reservoir management.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1.	Overview: Scope of applied reservoir engineering and reservoir management	2	To understand the overview and scope of the subject
2.	Generalized Oil & Gas MBE: Derivation, its Havlena and Odeh modification and application	4	To learn the use of MBE to understand reservoir behaviour
3.	Drive Mechanism and recovery factors: production behaviour of oil and gas reservoirs, gas reservoir MBE – p/z analysis	5	To understand the drive mechanisms and production behaviour of oil and gas reservoirs
4.	Performance prediction of oil reservoirs: Depletion drive, Gas cap drive, Water drive and Combination drive	4	To learn various techniques of performance prediction for various types of reservoirs
5.	Water influx: steady and unsteady state models – estimation of water influx	4	To learn to evaluate the water influx into the reservoir
6.	Reservoir pressure maintenance techniques: advantages and limitations	4	To learn application of pressure maintenance in the reservoir
7.	Flow of immiscible fluids through porous media: Continuity equation, equation of motion, solution methods. Displacement processes.	4	To understand the theory of immiscible displacement in the reservoir
8.	Water flooding Theory & practices: Buckley Leverette treatment of fractional flow and frontal advance equations - Recovery efficiency, permeability heterogeneity, Water for water flooding	5	To learn about immiscible fluid flow, various principles and equations applicable to water flooding operations
9.	Water flooding performance calculations: Frontal advance method, viscous fingering method, Stiles method, Dykstra-Parsons Method	5	To learn about calculations on water flooding performance by different methods
10.	Integrated Reservoir Management: applications and case studies	5	To learn principles of integrated reservoir management
Total contact hours:		42	

Text Books:

1. Reservoir Engineering Manual
2. Reservoir Engineering Handbook

F. W. Cole
Tarek Ahmed

Reference Books:

1. Fundamentals of Reservoir Engineering
2. Applied Petroleum Reservoir Engineering:
3. Integrated Reservoir Management

L. P. Dake
Crafts and Howkins
A. Satter and G. C. Thakur