Course Type	Course Code	Name of Course	L	T	P	Credit
DC2	PEC202	Elements of Petroleum Reservoir Engineering	3	0	0	9

Course Objective
The objective of the course is to present an introduction to Petroleum Reservoir Engineering, with an emphasis on how to provide basic knowledge of Reservoir Engineering.
Learning Outcomes
Upon successful completion of this course, students will:
have a broad understanding of concepts of Petroleum Reservoir Engineering, oil and gas properties, reservoir rock and fluid properties.
be able to understand the concepts of relative permeability, capillary pressure, phase behaviour of hydrocarbon fluids and principles of fluid flow, pressure measurement and reserve estimation.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1.	**Introduction to reservoir engineering.** Characteristics of crude oil and natural gas, classification of crude and its physicochemical properties	5	To learn about scope of reservoir engineering, characteristics, classifications and properties of oil and gas
2.	**Reservoir Rock Properties :** Porosity and permeability determination, combination of permeability in parallel & series beds, porosity permeability relationship, fluid saturation determination and significance	5	To know about definitions and their determination of reservoir rock properties, series and parallel combination of beds, fluid saturation, etc.
3.	**Effective and relative permeability**, wettability, capillary pressure characteristics, measurements and uses	5	To understand the concept of effective and relative permeability, capillary pressure
4.	**Reservoir Fluids:** Phase behaviour of hydrocarbon system, ideal & non ideal system, equilibrium ratios, reservoir fluid sampling, PVT properties determination, different correlations and laboratory measurements, data reduction, evaluation and application	6	To understand the phase behaviour of hydrocarbon, equilibrium ratio, fluid sampling, PVT properties determination, and their measurement, correlations, data reduction and applications,
5.	**Flow of Fluids through Porous Media:** Darcy's law, single and multiphase flow, linear, radial & spherical flow, steady state, semi steady state & unsteady state flow, GOR, WOR equations	5	To understand the principle of fluid flow in the porous media, linear, radial and spherical flow, steady and unsteady state flow
6.	**Special type of flow:** flow through fractures, Water and gas coning	5	To analyze flow through fractures and coning problems in wells
7.	**Reservoir Pressure Measurements and Significance:** Techniques of pressure measurement	5	To know the techniques of pressure measurements in the oil and gas wells
8.	**Reserve estimation:** Reservoir drives**,** resource & reserve concept, Different reserve estimation techniques: Volumetric, MBE, decline curve analysis;, latest SPE/ WPC/ IS classification	6	To understand the drive mechanisms, methods of oil and gas reserve estimation, latest reserve classification
	Total contact hours:	42	

Text Books:
1. Reservoir Engineering Handbook: Tarek Ahmed
2. Petroleum reservoir engineering: Petrophysical properties J. W Amyx; D. M. Bass Jr. and R L. Whiting

Reference Books:
1. Oil Reservoir Engineering S. J. Pirson