Course Type	Course Code	Name of Course	L	T	P	Credit
DE3	PED404	Petroleum Engineering Design	3	0	0	9

Course Objective

To provide the basic knowledge and skills of the oil and gas field development and economics.
To provide the basic knowledge and skills in the designing of oil and gas separation system
To provide the basic knowledge and skills in the designing of crude oil treatment systems
To provide the basic knowledge and skills in the designing of artificial lift systems

Learning Outcomes

Upon successful completion of this course, students will:
learn the different aspects of the development of oil and gas fields and have the ability to develop techno-economic oil and gas fields
learn the basic fundamentals of separators, heater treaters and artificial lift techniques and have the ability to design these systems as per requirements in the oilfields.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1.	**Development of Oil & Gas Fields:** Selection of development scheme, economic aspect of development of oil and gas fields. Production variants, performance prediction, Recovery factor, Stages of preparation of development plans.	5	This unit help the students to acquire the knowledge and skills related to field development planning and will be able to prepare field development plans for oil and gas fields
2.	**Oil Field Economics:** Introduction to cash flow petroleum analysis Computation of economic indices viz. Capital investment, payout period, IRR, Profile, Economic life etc. Analysis of different variants based on technical and economic considerations. Economic development of Marginal fields.	5	This unit will help students to acquire the knowledge and skills for the economic development of oil and gas fields
3.	**Design of oil and gas separation system:** Design of two phase and three phase separators.	6	This unit will help students to acquire the knowledge and skills in the designing of oil and gas separation system)
4.	**Crude oil Treatment:** Heater treaters, Electrostatic heater treaters, Design of heater treaters	4	This unit will help students to acquire the knowledge and skills in crude oil treatments
5.	**Basic principles and descriptions of Artificial lift techniques:** Gas-lift - continuous and intermittent, chamber lift, plunger lift/sucker rod pumping, and hydraulic pumping - piston & jet type.	5	This unit will help students to understand basic fundamentals of Artificial lift techniques
6.	**Design of Continuous gas lift system (pressure operated valves) -** graphical and analytical methods.	5	This unit will help students to acquire the knowledge and skills in the designing of continuous gas lift system
7.	**Design of Intermittent gas lift system**; single point injection standard tubing installation (Pressure operated valves) - graphical and analytical methods.	3	This unit will help students to acquire the knowledge and skills in the designing of intermittent gas lift system
8.	**Design of Sucker rod pumping system** (Learning outcome: To acquire the knowledge and skills in the designing of sucker rod pumping system)	5	This unit will help students to acquire the knowledge and skills in the designing of sucker rod pumping system

9.	**Characteristics and Selection of electric submersible pumping/PCP systems**	4	This unit will help students to acquire the knowledge and skills for the selection of electric submersible pumping/PCP systems
	Total contact hours:	**42**	

Text Books:

i. Surface Production Operation , : Arnold, Ken and Stewart, Maurice
ii. Principle of Artificial Lift : N.K. Mitra

Reference Books:

i. The Artificial lift technology (All Volumes) : Brown, K.E.
ii. Well Design: Drilling & Production : Craft, Holden & Graves
iii. Development of oil and gas fields : Sant Kumar