

Course Type	Course Code	Name of Course	L	T	P	Credit
DC	NPEC 501	Advanced Production Technologies	3	1	0	4

Course Objective

The objective of the course is to familiarize the students with well problem diagnosis and solutions and to predict reservoir performance from well performance data.

Learning Outcomes

Upon successful completion of this course, students will:

- Have the ability to diagnose well problems and apply solutions
- Have the ability to compute the current and future optimized production from wells
- Understand advance well systems and their application environment

Unit No.	Topics to be Covered	Contact Hours (L+T)	Learning Outcome
1.	Introduction: Advanced well equipment and subsurface well completions	6+1	Knowledge of advanced well equipment and subsurface well completions.
2.	Artificial lift equipment, horizontal and multilateral well completion systems.	5+1	Knowledge of various lift methods, horizontal and multilateral well completion systems.
3.	Formation damage, calculation of various skin factors such as perforation skin, partial completion skin, inclined well skin, and horizontal well skin.	4+2	Knowledge of various skin factors in wells due to drilling and various completion methods.
4.	Details on various IPR, various models of horizontal well productivity index	6+2	Knowledge of various IPR correlations applicable to vertical and horizontal wells.
5.	Details on various VLP (Poetmann and Carpenter, Hagedorn and Brown, Beggs & Brill etc.), multiphase flow and flow patterns, and modelling of liquid hold up.	6+2	Knowledge of various VLP correlations for vertical and horizontal wells.
6.	Pressure drop and tubing size optimization in horizontal, directional & vertical wells. Liquid loading problem and solution. Choke-performance relationships. Software applications in optimized production.	7+2	Ability to design an optimum production system that includes the major components of the production system.
7.	Coupling of well models with reservoir models using material balance for future well performance	5+2	Ability to forecast the future well performance using both well models and reservoir models with material balance.
8.	Advanced diagnostic methods and solutions	3+2	Knowledge of various production problems, their diagnostic techniques and solutions.
Total contact hours:		42 L+14 T = 56	

Text Books:

1. Petroleum Production Systems, Economides et al., Prentice Hall, 2012.
2. Production Operations II, Thomas O. Allen and Alan P. Roberts, PennWell books, 2012.

Reference Books:

1. Artificial Lift Methods, Kermit Brown, Vol. 4, PennWell Books, 1984.