

20PEB305					Advanced Drilling					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	0	0	3	3	25	50	25	--	--	100

COURSE OBJECTIVES

- The course aims to provide students with a fundamental understanding of petroleum well drilling procedures on offshore with an inclination of well or directional drilling, its mechanics, and design methodology.
- To give information about a well control method for all the well (onshore, offshore, horizontal, vertical and directional well) and its procedures.

UNIT 1 Directional Drilling**10 Hrs.**

Directional Drilling Technology, Objectives of Directional Drilling. Tools for deflection & orientation. Directional well profiles and well path – deflection & corrections Motor Types: PD motors and Turbo drills; their description, power calculations and applications. Directional drilling problems & their remedies. Auto and Verti-track systems: Rotary steerable motors and geo-steering tools.

10 Hrs.**UNIT 2 Horizontal Well Drilling**

Horizontal Well Drilling, Introduction of Horizontal well drilling: objectives & selection, drilling techniques and different well profiles, special mud requirements and their characteristics. Measurements While Drilling: objectives, MWD / LWD tools, Telemetry system and data interpretation Well Surveying: Objectives & methods. surveying analysis & calculations for well coordinates, multilateral

10 Hrs.**UNIT 3 Special Drilling Techniques**

Coil tubing drilling principles and applications, Slant drilling, Laser drilling, Drilling problems and Case studies

UNIT 4 Well Control Principles& Procedures**9 Hrs.**

The Anatomy of a KICK, Kicks - Definition, Kick Control (a) Dynamic kick control (b) Other Kick control methods- Driller & Engineer methods of kick control.

Max. 39 Hrs.**COURSE OUTCOMES**

On completion of the course, student will be able to

- CO1 - Demonstrate the understanding of different methods of directional drilling.
- CO2: Apply the fundamentals of Horizontal well drilling techniques.
- CO3: Execute the Measurement While Drilling and Logging While Drilling processes.
- CO4: Evaluate the economics involved in Directional, Horizontal and Multilateral Wells.
- CO5: Execute the special drilling methods viz. underbalanced, HP-HT, re-entry, extended reach, multilateral, slim-hole and coil tubing drilling method.
- CO6: Critically evaluate the selection of rig for Slant hole drilling.

TEXT/REFERENCE BOOKS

1. Bourgoyne , Adam T. Jr., Martin E. Chenevert, Keith K. Millheim and F.S. Young Jr., Richardson, TX (1991) Applied Drilling Engineering, Society of Petroleum Engineers.
2. Joshi, S. D. (1991) Horizontal Well Technology, Penn Well Publishing.
3. Adam, N. J. (1980) Well control Problems and Solutions. Petroleum Publishing Company
4. Baker, R. (1998) A Premier of Offshore Operations Petroleum Extension Service, Division of Continuing Education, University of Texas at Austin in cooperation with International Association of Drilling Contractors, Houston, Texas.
5. Robinson, T (1992) The Offshore: An Introduction to the Technology, terminology and operations of offshore oil Exploration

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max. Marks: 100**

Part A/Question: <Short Notes, Problems, Numerical>

Part B/Question: <Justification, Criticism, Long answers, Interpretation >

Exam Duration: 3 Hrs

<5-7 > Marks (each)

<8-10> Marks (each)