

17MPE113 : Advanced Drilling Engineering

Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	1	0	4	4	25	50	25	--	--	100

Unit-1: **Hours: 13**

Design

Design of Drill string design, Casing design, Bit Selection, BOP design, Wellbore Hydraulics

Unit 2 : **Hours:13**

Directional Drilling

Directional Drilling Technology, Objectives of Directional Drilling. Tools for deflection & orientation. Directional well profiles and well path – deflection & corrections Motor Types: PD motors and Turbodrills; their description, power calculations and applications, Horizontal Well Drilling, Introduction of Horizontal well drilling: Objectives & selection, Drilling techniques and different well profiles, Special mud requirements and their characteristics. Well Surveying: Objectives & methods. Surveying analysis & calculations for well coordinates Directional drilling problems & their remedies Auto and Verti-track systems: Rotary steerable motors and geo-steering tools.

Unit 3 : **Hours : 07**

Drilling Problems

Pipe sticking, Lost circulation, Sloughing shale, formation damage, fatigue failure of drill string, Bit failure, wire line failure etc. Well control and hydrodynamic pressure, well control techniques

Unit 4: **Hours : 06**

Non-conventional drilling methods

Special Drilling Methods: Foam, under balanced, overbalanced, plasma, electrical, top drive, re-entry, extended reach, jet, multilateral, slim-hole and coil tubing drilling methods; Drilling HPHT wells, Drilling fluids for HPHT environment, Case study of HPHT drilling

Total Hrs -39

Texts and References:

1. Malcom Rider, Second Edition, 2002: The Geological Interpretation of well logs, Rider-French Consulting limited
2. Oeberto Serra & Lorenzo Serra, 2004 : Well logging - data acquisition and applications, Edition Serralog, France
3. Jordan J R and Campbell F. L., , SPE, New York, 1986: Well Logging Vol. 1 and 2
4. Ellis, D. V. and Singer, J. M. 2nd edition, 2007: Well logging for Earth Scientist, Springer
5. Toby Darling, Well logging and Formation Evaluation, Gulf Professional Publishing, Elsevier Science