

20PEB228P					Drilling Engineering Practical					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
0	0	2	1	2	--	--	--	50	50	100

COURSE OBJECTIVES

- To provide the concept of measuring different properties of drilling fluid and cement slurry
- Explain the importance and limitations of all parameters of drilling fluid and cement slurry
- Provide the experimental procedure and data analysis of performed experiments
- To evaluate the drilling fluid and cement slurry properties as per standards

List of Experiments

1. Preparation of WBM and OBM including determination of pH of drilling fluid using pH meter.
2. To calibrate the mud balance and determine the specific gravity / density of the mud.
3. To measure the viscosity of drilling fluid using Marsh funnel viscometer.
4. To determine the Rheology of the drilling fluid using Rheometer.
5. To determine the volumes of Water, Oil and Solids in Drilling Fluid using Retort kit.
6. To determine the Fluid loss using Low-temperature/low-pressure API filtration apparatus.
7. To determine the Sand content in drilling fluid using sand content kit.
8. To determine the alkalinity in Drilling fluid and in filtrate of drilling fluid by titration method.
9. To determine the Total hardness in drilling fluid by titration method. Field procedure to determining the total hardness in mud filtrate.
10. To determine the Calcium and Magnesium in drilling fluid by titration method. Field procedure to determining the Ca in mud filtrate.
11. Field procedure for determining cation exchange capacity.
12. To determine the Emulsion stability using Emulsion stability (ES) meter.
13. To measure the gel or shear strength of drilling fluid using Shearometer.
14. To determine the Resistivity of drilling fluid and mud cake using Analog Resistivity meter.
15. Prepare homogeneous cement slurry with the help of Constant Speed Mixer.
16. To measure the absolute density of cement slurry using pressurized mud balance.
17. To determine the thickening time of cement slurries under simulated wellbore conditions using HPHT Consistometer
18. To condition cement slurry to test temperature to enable further testing using Atmospheric Consistometer.
19. To estimate the volume of filtrate lost to the formation using HPHT Filter Press.
20. To determine the rheological properties and graphical behavior of cement slurries using automated computerized viscometer.
21. To determine the stability of Cement Slurry under static Conditions using free water test.

Total 30 Hrs.**COURSE OUTCOMES**

On completion of the course, student will be able to

CO1 - Determine the drilling fluid properties

CO2 - Design the drilling fluid as per given condition.

CO3 - Decide the sequence for adding the additives to formulate mud with desired properties.

CO4 - Understand the impact of drilling fluid and cement on the environment and decide the procedure to reduce it

CO5 - Analyse the effect of various additives on properties of cement slurry

CO6 - Design the cement slurry for a given wellbore condition

TEXT/REFERENCE BOOKS

1. API RP 13I. 8th Edition, March 2009. Complete Document. Recommended Practice for Laboratory Testing of Drilling Fluids
2. Mitchell, R.F. and Miska, S.Z. (2011) Fundamentals of Drilling Engineering, Society of Petroleum Engineers

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max. Marks: 100****PART A:** Evaluation Based on the class performance and Laboratory book**PART B:** Viva Examination based conducted experiments**Exam Duration: 3 Hrs****50Marks****50 Marks**