

Faculty of Engineering & Technology

Advanced Drilling Technology

Information :

Course Code : PET 509

Level : Undergraduate

Course Hours : 3.00- Hours

Department : Department of Petroleum Engineering

Instructor Information :

Title	Name	Office hours
Associate Professor	Samir Mohamed Sayed Ahmed Khaled	4
Teaching Assistant	Abdelrahman Adel Abdullah Abdelghany Kandil	

Area Of Study :

1. Understand the Directional Drilling Planning, Calculations, Surveys, Deflecting tools, and Bottom Hole Assemblies.
2. Understand hole cleaning, and down hole problems related to directional drilling.
3. Enrich knowledge of Well Integrity.
4. Understand Cement Evaluation including Cementing Bond tools, and Zonal Isolation.

Description :

This course covers Advanced Drilling Engineering necessary subjects that will guide the students to know how to deal with new technologies while Drilling and completing different Well(s) Types (such as Underbalanced Drilling Techniques) as well as the Well Integrity (which covers: zonal isolation, evaluation of cementing bonds, inflow and outflow areas, Barriers and Barrier envelopes, Well integrity Management System.

Course outcomes :

a. Knowledge and Understanding: :

1 -	Describe an Introduction to Directional Drilling.
2 -	Describe the Fundamentals of Directional Drilling, Survey, and Down Hole Problems.
3 -	Classify the Directional Drilling Profiles, Types, Calculations, Bottom Hole Assemblies, and Deflecting tools.
4 -	Illustrate the effect of Drilling fluids properties on Hole cleaning.
5 -	Define Introduction and understanding of Well Integrity
6 -	Describe the Inflow, out flow areas, and Zonal Isolation.
7 -	Classify Cementing bonds tools and cement evaluation.
8 -	Explain the WI requirements for Completion string and Well head.

b. Intellectual Skills: :

1 -	Apply principles and concepts of well design in solving Drilling problems.
2 -	Apply updating Drilling Engineering software.
3 -	Demonstrate Presentation skills in Drilling Engineering.

c. Professional and Practical Skills :

1 -	Argue the student to Use software in solving drilling problems.
2 -	Select the proper oil well planning, and well control.
3 -	Design calculations
4 -	Auditing methods Discuss the different methods of Directional Drilling calculations.

d. General and Transferable Skills :

1 -	Communicate effectively in team and solve problems.
2 -	Work in stressful environment and within constraints.
3 -	Effectively manage the Computer Softwares.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to Directional Drilling	5	3	2
Zonal Isolation Guidelines and Fundamentals for Directional drilling and Surveys	10	6	4
Directional Wells Patterns: Planning and Calculations	10	6	4
Deflecting tools and Directional Bottom hole assemblies (rotary and steerable BHA)	10	6	4
Hole Cleaning related to Directional Drilling	5	3	2
Down Hole Problems related to Directional Drilling	5	3	2
Introduction and understanding of Well Integrity and Zonal Isolation.	10	6	4
Cementing bonds tools and evaluation.	10	6	4
Inflow and out flow areas.	5	3	2
WI requirements for Completion string and Well head	5	3	2

Teaching And Learning Methodologies :

Interactive Lecturing
Problem Solving
Experiential Learning

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	10.00		
Final Exam	40.00		
Mid- Exam I	30.00		
Participation	10.00		
performance	10.00		

Course Notes :

Course Handouts

Recommended books :

1. Drilling Engineering Workbook
2. Drilling Manuals from Different Oil & Gas Companies Such as: Shell and ENI.