

Course Description Form

1. Course Name: Well logging

2. Course Code: PE306

3. Semester / Year: 2024-2025

4. Description Preparation Date: 25-9-2024

5. Available Attendance Forms: Class

6. Number of Credit Hours (Total) / Number of Units (Total): 72 Hours

7. Course administrator's name

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8. Course Objectives

- Learning the processes of recording geological and geophysical wells
- Teach students how to evaluate oil formations and reservoirs
- Teach students how to calculate oil inventory in programs
- Teach the student how to refrain between wells with sessions و



9. Teaching and Learning Strategies

- Providing an academic and practical environment that keeps pace with development through modern laboratories.
- Field visits to oil, local and international companies to keep pace with recent developments in extractive industries.

- Developing education to suit development and introducing modern programs.
- Achieve the visit of foreign and domestic oil companies.
- Take account of the local market to graduate students who keep up with modern ways in taking probes

10. Course Structure

Week

Hour

1	2 theoretical+ 1Tutorial	An explanation of the main types of geological and geophysical Logging	An introduction	Theoretical lecture &Tutorial applications	Quizzes, monthly exams, homework, evaluation final exam.
2	2Theo+1Tuto	Lithological and petrophysical characteristics of rocks, which include rock type, density, porosity and permeability.	Petrophysical properties	Theoretical lecture & computer applications	Quizzes, monthly exams, homework, evaluation final exam.
3	2Theo+1Tuto	Porosity and permeability calculations for roc	petro physical calculations	Theoretical lecture & tutorial	Quizzes, monthly exams, homework, evaluation final exam.

4	2Theo+1Tuto	Principles of spontaneous potential of beds in wells.	Spontaneous potential log.	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework, evaluation final exam.
5	2Theo+1Tuto	How to use the spontaneous potential log(splog) to determine the permeable and low permeable areas	Spontaneous potential log.	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework, evaluation final exam.
6	2 theoretical + 1 Tutoria	Calculating the volume of shale using the equations for the spontaneous potential difference	V-shale calculation from sp log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework, evaluation final exam.
7	2Theo+1Tuto	Basic principles of electrical Resistivity log calculations.	Conventional Resistivity Log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework,
8	2Theo+1Tuto	Principles of the work of the induction and.	Induction log .	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework,
9	2Theo+1Tuto	conductivity of Rocks by means measurement of conductivity of rocks by means of the induction log .	nduction log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework,
10	2Theo+1Tuto	The results extracted from the induction logs.	Induction Electrical Log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework,

11	2Theo+1Tuto	Working principles and outputs of lateral induction log.	Lateral induction log.	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework,
12	2Theo+1Tuto	Scale comparing lateral induction log with an induction log.	Lateral induction Log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework,
13	2Theo+1Tuto	The basics of the work of the accurate electrical resistivity log	Microlog	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework,
14	2Theo+1Tuto	The method of readings of the flashed zone resistance and the real uninvaded resistance.	Simple 1D Linear Flow with Sources/Sinks (part 1)	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework,
15	2Theo+1Tuto	The basics of the principle of the work of the acoustic log and the calculation of the velocity of sound waves for each configuration	Sonic log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework,
16	2Theo+1Tuto	Calculation of the primary porosity of the sonic log	Sonic log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework,
17	2Theo+1Tuto	The basics and principle of the work of the equipment of the density log - Calculation of the	Density log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework,

18	2Theo+1Tuto	The basics of the neutron log	Neutron log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework
19	2Theo+1Tuto	Finding the porosity of the neutron log, hydrocarbon effects, and the presence of shale	Neutron log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework
20	2Theo+1Tuto	Uses of the composite log in finding stony and porosity	Composite neutron Density log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework
21	2Theo+1Tuto	Basics of device operation and how to read gamma ray log.	Gamma ray Log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework
22	2Theo+1Tuto	Calculation of Shale Volume from Gamma ray Log.	Gamma ray Log	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework
23	2Theo+1Tuto	Calculations of the thermal gradient, the cement bond, and the linkage	TDT temperature sensors, CBL and CCL logs	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework
24	2Theo+1Tuto	Quick methods for determining oil evidence from sensors	Hydrocarbon Detection	Theoretical lecture & Tutorial	Quizzes, monthly exams, homework

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any): Basic well logging–Baghdad university

Main references (sources): 1-Shlumberger references book.

2–A Comprehensive Guide to Well Logging Esimtech–

Recommended books and references (scientific journals,: reports...): The Basics of Well Probing, translated by Asquit and Gibson.

Electronic References, Websites: https://www.arab-oil-naturalgas.com/oil-well-logging-books/#google_vignette