Department of Earth Sciences and Petroleum

College of Science

University of Salahaddin/Erbil

Subject: Well logging

Course Book – *For* (Years 3)

Lecturer's name: Mr. Mahdi Khairi

Academic Year: 2023/2024

Course Book

1. Course name	**Well Logging**
2. Lecturer in charge	**Mahdi Khairi**
3. Department/ College	**Earth Sciences and petroleum**
4. Contact	**e-mail: mahdi.aswad@su.edu.krd** **Tel: (optional)07504790723**
5. Time (in hours) per week	**theory 1** **Practical: 6 for three groups**
6. Office hours	**Availability of the lecturer to the student during the week**
7. Course code	
8. Teacher's academic profile	**Mr. Mahdi Khairi Aswad** **I have an MSc in petroleum Geology and I am a Ph.D. Candidate in petroleum Geology. I have worked with different oil and gas companies in drilling, production, logging, geology, and HSE.**
9. Keywords	**Wireline Logging Interpretation**

10. Course overview:

This course is considered the core course in the petroleum and earth science department as it is one of the selective courses that the students should cover. The course aims to let the students understand the main logging and drilling services that should be done at any well location. Understand the logging and drilling service types and companies that work in this field. Wireline logging is helping the student to have a wide knowledge of the petroleum fields. It is more focused on the oil and gas field in Kurdistan.

11. Course objective:

The main aim of this course is to show the logging tool and components then, they will learn

- Wireline logging operation
- Basic Wireline logging interpretations
- LWD operation
- Learn drilling site services types and functions of each company
- Work on the drilling services fields
- Comparing horizontal and vertical drilling
- Wireline process in both cases

Understand drilling operation steps and the drilling process

12. Student's obligation

All the students must attend the class and do Exams, Homework, Seminar, and quizzes.

13. Forms of teaching

- Active learning

- Cooperative learning
- Class dissuasion
- Homework
- Assignment
- Quiz
- Seminar
- Applied Student-centered classroom

  The above-mentioned learning and teaching strategies have been implemented as a strategy of learning to motivate the students to participate and engage in the class more effectively.

Teaching will be done using a data show, PowerPoint, practical simulations, and course notes will be handed to students.

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14. Assessment scheme

we will assess our students based on the following criteria

- Monthly Exam
- Cooperative learning
- Class dissuasion
- Class activity
- Homework
- Assignment
- Quiz
- Weekly report

15. Student learning outcome:

The students will be able to get a job in the oil and gas sector anywhere in the world, specifically in the Kurdistan petroleum industry. the material which will be provided and studied in this course is highly technical level material. It is related to the current application in oil and gas.

The current industry needs people at the level of our students to fill different positions.

16. Course Reading List and References:

- Malcolm, R. and Martin, k., 2011. The geological interpretation of well logs. Rider-french Consulting Ltd. Scotland.
- Hurst, a., Lovell, M. And Morton, A., 1990. *Geological applications of wireline logs*. London: Geological Society.
- Parasnis, d., 1997. *Principles of applied geophysics*. London: Chapman and hall.

- Serra, o., 2008. *Well logging handbook*. Paris, france: éditions TECHNIP.
- Serra, o., 1986. *Fundamentals of well-log interpretation*. Amsterdam: elsevier.
- Harrison, b., 1995. *Russian-style formation evaluation*. Londres: london petrophysical society.
- Merkel, r., 1979. *Well log formation evaluation*. Tulsa, okl.: American association of petroleum geologists.
- 2012. *Openhole log analysis and formation evaluation*. [Erscheinungsort nicht ermittelbar]: richardson.

17. The Topics:	**Lecturer's name**
Week1: Introduction about well logging. Week2: Conventional Well logging Calliper Tool and GR Week3: Resistivity Log Week4: Neutron log Week5: Density Log Week6: Acoustic Log Week7: Midterm Exam Week8: Lithology through logging Week9: Combination Logs Week10: Porosity through logs	Mahdi Khairi

Week11: M and N Week12: Saturation types Week13: Midterm Exam Week14: Image log Week15: Correlation	
18. Practical Topics (If there are any)	
In this section, the lecturer shall write titles of all practical topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date, and time of the lab: ➢ Lab.1: Course Book and Log reading ➢ Lab.2: HC detection from Calliper and GR log ➢ Lab.3: Identify HC and water from the Resistivity Log ➢ Lab.4: Oil and gas detection from Density and Neutron log ➢ Lab.5: Hydrocarbon detection from logs set ➢ Lab.6: lithology identification from logs ➢ Lab.7: porosity identification from Neutron ➢ Lab.8: porosity identification from Three sisters' log ➢ Lab.9: M and N Logs ➢ Lab.10: Saturation identifications from Log 1 ➢ Lab. 11: Saturation identifications from Log 1 ➢ Lab.12: sequence stratigraphy from log ➢ Lab. 14: Correlation ➢ Lav. 14: software application	Mahdi Khairi
19. Examinations: ***1. Compositional:*** In this type of exam the questions usually start with Explain, Evaluation, and analysis How is Reservoir and Non-Reservoir zones identified by GR? Explain the steps and procedures. What is the relation of GR to the source rock? Evaluate this statement. ***2. draw the log relations***	

In this type of exam, a draw about a specific subject will be provided, and then students will comment on the illustrations. Examples should be provided

3. Interpretation:

In this type of exam, there will be several statements and figures, students will interpret the existing example. Examples should be provided.

20. Extra notes:

Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks.

-To enrich the wireline logging course, we must have practical study or work in the field and oil companies, for this, we need the support of precedence of Salahaddin University.

21. Peer review پێداچوونەوەی هاوەڵ

This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing a few sentences in this section.

(A peer is a person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, lecturer, or an expert in the field of your subject).

ئەم کۆرسبووکە دەبێت لەلایەن هاوەڵێکی ئەکادیمیەوە سەیر بکرێت و ناوەڕۆکی بابەتەکانی کۆرسەکە پەسەند بکات و جەند ووشەیەک بنووسێت لەسەر شیاوی ناوەڕۆکی کۆرسەکە و واژووی لەسەر بکات.

هاوەڵ ئەو کەسەیە کە زانیاری هەبێت لەسەر کۆرسەکە و دەبیت پلەی زانستی لە مامۆستا کەمتر نەبێت.