UNSW Course Outline

PTRL5107 Petrophysics - 2024

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General Course Information

Course Code : PTRL5107
Year : 2024
Term : Term 2
Teaching Period : T2
Is a multi-term course? : No
Faculty : Faculty of Engineering
Academic Unit : School of Minerals & Energy Resources Engineering
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This course covers the fundamental of well logging and log interpretation which forms the foundation of reservoir evaluation. Students will be introduced to real well-log data for quality control, analysis and interpretation and will learn the way well-log data are obtained, processed and presented within industry standards.

Course Aims

This course covers the fundamental of well logging and log interpretation which forms the foundation of reservoir evaluation. Students will be introduced to real well-log data for quality control, analysis and interpretation and will learn the way well-log data are obtained, processed and presented within industry standards. Well logging is an integrated part of petroleum engineering discipline and is used from an early exploration stage to late aboundment stage of a reservoir life cycle. Well logging is also part of reservoir evaluation providing input to geophysical analysis, reservoir analysis, production analysis, drilling analysis and reservoir geomechanical analysis.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Obtaining knowledge of physical principles of well logging and the tools used to measure petrophysical properties
CLO2 : Fundamentals of quantitative and qualitative interpretation of well-log data
CLO3 : Simple interpretation a set of real well-log data using gained knowledge within groups
CLO4 : Preform individual interpretation of a complex reservoir

Course Learning Outcomes	Assessment Item
CLO1 : Obtaining knowledge of physical principles of well logging and the tools used to measure petrophysical properties	• Mid-Term Quiz • Assignment • Final Exam
CLO2 : Fundamentals of quantitative and qualitative interpretation of well-log data	• Mid-Term Quiz • Assignment • Final Exam
CLO3 : Simple interpretation a set of real well-log data using gained knowledge within groups	• Assignment
CLO4 : Preform individual interpretation of a complex reservoir	• Project

Learning and Teaching Technologies

Moodle - Learning Management System | Blackboard Collaborate | Echo 360

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Mid-Term Quiz Assessment Format: Individual	25%	
Project Assessment Format: Individual	25%	
Assignment Assessment Format: Individual	10%	
Final Exam Assessment Format: Individual	40%	

Assessment Details

Mid-Term Quiz

Assessment Overview

Mid-term quiz will cover the physics and principle of resistivity, nuclear and acoustic log measurements. The quiz will be openbook and students require submitting their handwriting pdf onto Moodle. The time of quiz is 3 hrs. The quiz will be solved for students in the class after to have a self-assessment comparison.

Course Learning Outcomes

- CLO1 : Obtaining knowledge of physical principles of well logging and the tools used to measure petrophysical properties
- CLO2 : Fundamentals of quantitative and qualitative interpretation of well-log data

Project

Assessment Overview

A project is given individually on advanced interpretation of one of the logging methods. A 10 pages report is required by the end of the trimester. The details of report structure requirements are provided on Moodle page of the course. The project assists students with developing their technical writing as well as communication and research skills.

Course Learning Outcomes

- CLO4 : Preform individual interpretation of a complex reservoir

Assignment

Assessment Overview

A set of real well log data is provided to students for interpretation of lithological units and petrophysical properties. A 10 pages report needs to be submitted for the assignment. The information about the structure of the report is provided on the Moodle page of the course. A detailed assessment of the assignment will be provided to students as a self-assessment comparison after due date.

Course Learning Outcomes

- CLO1 : Obtaining knowledge of physical principles of well logging and the tools used to measure petrophysical properties
- CLO2 : Fundamentals of quantitative and qualitative interpretation of well-log data
- CLO3 : Simple interpretation a set of real well-log data using gained knowledge within groups

Final Exam

Assessment Overview

The final test covers all components of the course including the physical analysis, and log interpretation. The exam is openbook and students require submitting their handwriting in a pdf format onto Moodle.

Course Learning Outcomes

- CLO1 : Obtaining knowledge of physical principles of well logging and the tools used to measure petrophysical properties
- CLO2 : Fundamentals of quantitative and qualitative interpretation of well-log data

General Assessment Information

Further information about course assessments will be provided on Moodle.

Grading Basis

Standard

Course Schedule

Attendance Requirements

It is expected that student will attend at least 80% of tutorials and lectures. Normally, there is no make-up work for poor attendance and student might fail the course. If you have misadventure or ill-health, please contact your course coordinator as soon as possible. The attendance requirement is not meant to be punitive. It is included because participation is an important part

of achieving the course outcomes.

General Schedule Information

General Schedule information will be provided on Moodle.

Course Resources

Prescribed Resources

Bateman, R, Log Quality Control, 1984.

Bateman, R M, Open Hole Log Analysis and Formation Evaluation, International Human Resources Development Corporation, Boston, 1985.

British Petroleum Co. Ltd, Our Industry Petroleum, Jarrold & Sons, Norwich, 1977.

Clark, N, Elements of Petroleum Reservoirs, SPE Series, 1960.

CoreLab, Fundamentals of Core Analysis, 1973.

Desbrandes, R, Encyclopedia of Well Logging, 1985.

Dewan, J, Essentials of Modern Open Hole Logging, 1983.

Dresser Atlas, Well Logging and Interpretation Techniques, 1982.

Dresser Atlas, Log Interpretation Charts, 1985.

Helander, D, Fundamentals of Formation Evaluation, 1983.

Hilchie, D, Applied Open Hole Log Operations, 1982.

Lynch, E, Formation Evaluation, 1962.

Pirson, S, Geologic Well Log Analysis. Schlumberger, Log Interpretation Principles/Applications, 1989

Schlumberger, Log Interpretation Charts, 1995.

Stokes, W L, Essentials of Earth History, Prentice-Hall Inc., Englewood Cliffs, NJ, 1960.

Recommended Resources

Society of Petroleum Engineers: http://www.spe.org Australian Petroleum Production and Exploration Association: http://www.appea.com.au American Association of Petroleum Geologists: http://www.geobyte.com

Petroleum Exploration Society of Australia: http://www.pesa.com.au

American Petroleum Institute - For Petroleum Standards www.api.org

Society of Petrophysicists & Well Log Analysts www.spwla.org

European Association of Geoscientists & Engineers www.eage.org

The Society of Exploration Geophysicists www.seg.org

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Hamid Roshan		TETB, Room 221		Fridays	No	Yes

Other Useful Information

Academic Information

I. Special consideration and supplementary assessment

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to, or within 3 working days of, submitting an assessment or sitting an exam.

Please note that UNSW has a Fit to Sit rule, which means that if you sit an exam, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the information on UNSW's Special Consideration page.

II. Administrative matters and links

All students are expected to read and be familiar with UNSW guidelines and polices. In particular, students should be familiar with the following:

- Attendance
- UNSW Email Address
- Special Consideration
- Exams
- Approved Calculators
- Academic Honesty and Plagiarism
- Equitable Learning Services

III. Equity and diversity

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course convener prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equitable Learning Services. Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

IV. Professional Outcomes and Program Design

Students are able to review the relevant professional outcomes and program designs for their streams by going to the following link: https://www.unsw.edu.au/engineering/student-life/student-resources/program-design.

Note: This course outline sets out the description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle or your primary learning management system (LMS) should be consulted for the up-to-date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline/Moodle/LMS, the description in the Course Outline/Moodle/LMS applies.

Academic Honesty and Plagarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism, visit: student.unsw.edu.au/plagiarism. The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment tasks.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis or contract cheating) even suspension from the university. The Student Misconduct Procedures are available here:

www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Submission of Assessment Tasks

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of five percent (5%) of the maximum mark possible for that assessment item, per calendar day.

The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day. This is for all assessments where a penalty applies.

Work submitted after five days (120 hours) will not be accepted and a mark of zero will be awarded for that assessment item.

For some assessment items, a late penalty may not be appropriate. These will be clearly indicated in the course outline, and such assessments will receive a mark of zero if not completed by the specified date. Examples include:

- Weekly online tests or laboratory work worth a small proportion of the subject mark;
- Exams, peer feedback and team evaluation surveys;

- Online quizzes where answers are released to students on completion;
- Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date; and,
- Pass/Fail assessment tasks.

Faculty-specific Information

Engineering Student Support Services – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

Engineering Industrial Training – Industrial training questions

UNSW Study Abroad – study abroad student enquiries (for inbound students)

UNSW Exchange – student exchange enquiries (for inbound students)

UNSW Future Students – potential student enquiries e.g. admissions, fees, programs, credit transfer

Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

School-specific Information

Course completion

Course completion requires submission of all assessment items. Failure to submit all assessment items may result in the award of an Unsatisfactory Failure (UF) grade for the Course unless special consideration has been submitted and approved.

Submission of Assessment Tasks

We encourage you to retain a copy of every assignment submitted for your own record, either in hardcopy or electronic form. All assessments must have an assessment cover sheet attached (if required).

Student Resources

The School has student resources section, containing useful advice and information to ensure you're able to focus on your studies.

Computing Resources and Internet Access Requirements

UNSW Minerals and Energy Resources Engineering provides blended learning using the online Moodle LMS (Learning Management System). Also see - Transitioning to Online Learning: www.covid19studyonline.unsw.edu.au

Note that some specialist engineering software is not available for Mac computers.

- Mining Engineering Students: OMB G48
- Petroleum Engineering Students: TETB LG34 & LG35

For more information about system requirements is available at www.student.unsw.edu.au/moodle-system-requirements

Accessing Course Materials Through Moodle

Course outlines, support materials are uploaded to Moodle, the university standard Learning Management System (LMS). In addition, on-line assignment submissions are made using the assignment dropbox facility provided in Moodle. All enrolled students are automatically included in Moodle for each course. To access these documents and other course resources, please visit: www.moodle.telt.unsw.edu.au

School Contact Information

School of Minerals and Energy Resources Engineering
Old Main Building, Level 1, 159 (K15)
UNSW SYDNEY NSW 2052 AUSTRALIA

For current students, all enquiries and assistance relating to enrolment, class registration, progression checks and other administrative matters, please see The Nucleus: Student Hub.

Web & Important Links:
School of Minerals and Energy Resources
The Nucleus Student Hub
Moodle

UNSW Handbook

UNSW Timetable

Student Wellbeing

Urgent Mental Health & Support

Equitable Learning Services