

PTRL2020

Petrophysics

Term 2, 2023



Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Hamid Roshan	h.roshan@unsw.edu.au	Fridays	TETB, Room 221	

School Contact Information

School of Minerals and Energy Resources
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](#)

Course Details

Units of Credit 6

Summary of the Course

The fundamentals of downhole geophysical logging (well-logging) and log interpretation are covered in this course. Well-logging is used in several industries such as Petroleum, Mining, Civil and Infrastructure and Engineering Geology to obtain the formation properties around the borehole accurately with high spatial resolution. Well-logging data can provide numerous opportunities to extract formation characteristics from mechanical to flow properties and are important from early stage of exploration to late stage of abandonment and closure.

Course Aims

In this course, students are introduced to reservoir rock and fluid properties and learn the fundamental of well logging and log interpretation. The integration of fluid-rock properties through core analysis along with well-log interpretation forms the foundation of reservoir evaluation. As part of the course, students are also introduced to real well-log data for quality control, analysis and interpretation.

Course Learning Outcomes

1. Understanding the petrophysical properties of the reservoirs and the ways they are measured in routine and special core analysis workflow.
2. Obtaining knowledge of physical principles of well logging and the tools used to measure petrophysical properties.
3. Fundamentals of quantitative and qualitative interpretation of well-log data.
4. Simple interpretation of a set of real well-log data using gained knowledge within groups.

Teaching Strategies

The teaching approach in this course involve lectures, tutorials and laboratory sessions. Lecture presentations cover theoretical and practical aspects, which are also described in the supporting academic texts and teaching resources. A series of in-class exercises will be employed to reinforce and build upon the concepts introduced during the lectures. You are expected to read prescribed materials in advance of classes to enable active participation. You will also perform experiments in labs to gain hands-on experience in rock and fluid property measurements.

Assessment

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Mid-Term Exam	25%	Week 7	1
2. Lab report	25%	Not Applicable	1
3. Final Exam	40%	Not Applicable	1, 2, 3
4. Log interpretation	10%	Week 4	4

Assessment 1: Mid-Term Exam

Due date: Week 7

Deadline for absolute fail: Mid-Term Exam will be run in Week 7 in tutorial hrs.

Mid-Term Exam will be run in Week 7 in tutorial hrs.

Assessment criteria

Mid-term exam will be around log lithology interpretation

Assessment 2: Lab report

Deadline for absolute fail: Any failure to attend lab sessions will be reviewed by Dr Chen

Lab work is conducted on 4 weeks and are allocated to petrophysical property measurements of rocks in the lab. A report of the lab work is expected at the last week.

Assessment criteria

Laboratory session must be attended

Assessment 3: Final Exam

Deadline for absolute fail: Any misadventure should be followed with a Special Consideration.

Final Exam will be run on all sections of the course in particular the log interpretation.

Assessment criteria

The final exam is focused on log interpretation although all parts of the course are covered in the exam.

Assessment 4: Log interpretation

Due date: Week 4

Deadline for absolute fail: Extension should be requested with proper reasoning.

A set of real data is provided and interpretation of the data is expected.

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.

Course Schedule

[View class timetable](#)

Timetable

Date	Type	Content
Week 4: 19 June - 23 June	Assessment	Log interpretation
Week 7: 10 July - 14 July	Assessment	Mid-Term Exam

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

Submission of Assessment Tasks

The School has developed a guideline to help you when submitting a course assignment.

We encourage you to retain a copy of every assignment submitted for assessment for your own record either in hardcopy or electronic form.

All assessments must have an assessment cover sheet attached.

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.

Late Submission of an Assignment

Full marks for an assessment are only possible when an assessment is received by the due date. 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. 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 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, or
- Online quizzes where answers are released to students on completion, or Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date, or Pass/Fail assessment tasks.

We understand that at times you may not be able to submit an assignment on time, and the School will accommodate any fair and reasonable extension. We would recommend you review the UNSW Special Consideration guidelines – see section below.

Special Consideration

You may be eligible for special consideration, when an illness or other short-term events beyond your control (exceptional circumstances) affect your assessment performance. More details on special consideration can be found at: www.student.unsw.edu.au/special-consideration

We ask that you please contact the Course Convenor immediately once you have completed the special consideration application, no later than one week from submission.

Student Support

The University and the Faculty provide a wide range of support services for students, including:

- Library training and support services - www.library.unsw.edu.au
- Academic Skills Support - <https://www.student.unsw.edu.au/skills>
- Psychology and Wellness - www.counselling.unsw.edu.au

Equitable Learning Services aims to provide all students with a free and confidential service that provides practical support to ensure that your health condition doesn't adversely affect your studies. <https://student.unsw.edu.au/els>

Academic Honesty and Plagiarism

Your lecturer and the University will expect your submitted assignments are truly your own work. UNSW has very clear guidelines on what plagiarism is and how to avoid it. Plagiarism is using the words or ideas of others and presenting them 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. The University has adopted an educative approach to plagiarism and has developed a range of resources to support students. All the details on plagiarism, including some useful resources, can be found at www.student.unsw.edu.au/plagiarism.

All MERE students are required to complete a student declaration for academic integrity which is outlined in the assignment cover sheets. By signing this declaration, you agree that your work is your own original work.

If you need some additional support with your academic skills, please contact the Academic Skills Support or view some of the resources on their website: <https://www.student.unsw.edu.au/skills>. The Academic Skills Team can provide resources, support and assistance to help you improve your academic skills. Some students use the Centre services because they are finding their assignments a challenge, others because they want to improve an already successful academic performance.

Academic Information

Course Results

For details on UNSW assessment policy, please visit: www.student.unsw.edu.au/assessment

In some instances your final course result may be withheld and not released on the UNSW planned date. This is indicated by a course grade result of either:

- LE – indicates you have not completed one or more items of assessment; or
- WD – indicates there is an issue with one or more assignment; or
- WC – which indicates you have applied for Special Consideration due to illness or misadventure and the course results have not been finalised.

In either event it would be your responsibility to contact the Course Convener as soon as practicable but no later than five (5) days after release of the course result. If you don't contact the convener on time, you may be required to re-submit an assignment or re-sit the final exam and may result in you failing the course. You would also have a NC (course not completed) mark on your transcript and would need to re-enroll in the course.

Studying a course in the School of Minerals and Energy Resources Engineering at UNSW

Student Resources

This engineering [student resources](#) section collates 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 on-line Moodle LMS (Learning Management System). Also see - Transitioning to Online Learning: www.covid19studyonline.unsw.edu.au

It is essential that you have access to a PC or notebook computer. Mobile devices such as smart phones and tablets may compliment learning, but access to a PC or notebook computer is also required. Note that some specialist engineering software is not available for Mac computers.

- Mining Engineering Students: OMB G48
- Petroleum Engineering Students: TETB LG34 & LG 35

It is recommended that you have regular internet access to participate in forum discussion and group work. To run Moodle most effectively, you should have:

- broadband connection (256 kbit/sec or faster)

- ability to view streaming video (high or low definition UNSW TV options)

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

This course outline sets out 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 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 (as updated in Moodle), the description in the Course Outline/Moodle applies.

How We Contact You

At times, the School or your course convenors may need to contact you about your course or your enrolment. Your course convenors will use the email function within Moodle or we will contact you on your @student.unsw.edu.au email address.

We understand that you may have an existing email account and would prefer for your UNSW emails to be redirected to your preferred account. Please see instructions on how to redirect your UNSW emails: "[How can I forward my emails to another account?](#)"

How You Can Contact Us

We are always ready to assist you with your inquiries. To ensure your question is directed to the correct person, please use the email address below for:

- Enrolment or other admin questions regarding your program: <https://unswinsight.microsoftcrmpartals.com/web-forms/>
- Course inquiries should be directed to the Course Convenor

Image Credit

Synergies in Sound 2016

CRICOS

CRICOS Provider Code: 00098G

Acknowledgement of Country

We acknowledge the Bedegal people who are the traditional custodians of the lands on which UNSW Kensington campus is located.