Faculty of Engineering

School of Minerals and Energy Resources Engineering

Undergraduate Course Outline

PTRL3015

Well Drilling Equipment and Operations

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CONTENTS

1. INFORMATION ABOUT THE COURSE

2. AIMS, LEARNING OUTCOMES AND GRADUATE ATTRIBUTES

2.1. Course Aims

This course is taught from a practical view with the aim that students will learn how to streamline and optimize rig operations and gain the technical skills to provide cost-effective solutions to common rig problems associated with day to day operations. Students enrolled in this course will be given an in depth view of the physical processes involved in drilling oil and gas wells, both onshore and off-shore.

2.2. Learning Outcomes

By the end of this course students will:

1. learn the functions and roles of key drilling equipment and apparatus.
2. be given an in-depth view of the physical processes involved in drilling oil and gas wells, both on shore and off-shore.
3. learn to select appropriate drilling rig components & equipment as to optimize costs for a given drilling operation (onshore or offshore).

2.3. Graduate Attributes

To be added as requested by SMC
https://teaching.unsw.edu.au/sites/default/files/uploadfiles/unsw-graduateattributes_0.pdf

3. REFERENCE RESOURCES

3.1. Reference Materials

Support material for this course including, whenever available, copies of lecture notes, recommended readings, etc. can be found on Moodle.

The lecture note may be viewed and downloaded from the UNSW Moodle http://moodle.telt.unsw.edu.au/.

3.2. Text

Followings are the reccomended books for this course.

- Drilling Equipment & Operations Course Notes, UNSW Australia
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- www.pesa.com.au (The Petroleum Exploration Society of Australia)
- www.spe.org (Society of Petroleum Engineers)
- www.api.org (American Petroleum Institute – For Petroleum Standards)

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

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4. COURSE CONTENT AND LEARNING ACTIVITIES

4.1. Course content

1. Power System
2. Circulation System
3. Hoisting System
4. Supporting Structure
5. DrillstringComponents & Forces on Drillstring
6. Rotary System
7. Rotary Drilling Bits
8. Offshore Drilling Systems
9. Blow-out Preventers (BOP)

4.2. Learning Activities Summary

UNSW Wk	Activity	Content
1	Lecture	x Course introductio[redacted]tations x Power System o Describe the power requiremen[redacted]fferent e[redacted]ent on a typical land or offshore drillin[redacted] o Identify th[redacted]des of power gene[redacted] o Understan[redacted]different means [redacted]er transmis[redacted] o Plan & selec[redacted]gine-generator system for a spe[redacted]

7	Lecture	x Rotary Drilling Bits o Identify different types of bits & their classifications: roller cutter, diamond & poly crystalline diamond compacts (PDC) bits. o Understand the different components of bits & their functions: cone, bearings, teeth & nozzle for rock bits; geometry of cone surface, compacts etc for diamond bits. o Estimate the penetration rate, bit life & drilling costs based on tooth wear & bearing wear for different drilling situations.

Study Period 17 Feb – 28 Apr 2020
Exam Period 2 May – 15 May 2020

Other UNSW Key dates https://student.unsw.edu.au/new-calendar-dates

5. COURSE ASSESSMENT

5.1. Assessment Summary

Assessment task	Due date/ week	Weight	Assessment	Learning outcomes assessed
1	End of Week 3 End of Week 5 End of Week 7 End of Week 9	16% (4% x 4)	Assignments	1, 2, 3
2	Week 6	14%		

Assignments related details/submission box will be available online through Moodle. Access to the Moodle site is via the Moodle icon on the MyUNSW homepage.

6. ASSESSMENT CRITERIA

The assessment criteria provide a framework for you to assess your own work before formally submitting major assignments to your course convenor. Your course convenor will be using this framework to assess your work and as a way to assess whether you have met the listed learning outcomes and the graduate attributes for your program. We ask that you don't use the assessment criteria guidelines as a checklist, but as a tool to assess the quality of your work. Your course convenor will also be looking at the quality, creativity and the presentation of your written assignment as they review the framework. Rubrics, wherever applicable, will be provided at the time of the assignment release.

6.1 Assignments

Four assignments will be given to students. Generally student would need to submit via Moodle before the due date. Submissions containing plagiarism will receive zero mark.

6.2 Midterm Exam

Midterm Exam will test the understanding of the material presented till date. General format of exam will be a combination of descriptive questions and calculations.

6.3 Labs

Please refer to the Course Outline: Unit B: Drilling and Production Laboratory.

6.4 Final Exam

Final Exam will cover all the topics discussed in this course.

7. STUDYING A UG COURSE IN UNSW MINERALS AND ENERGY RESOURCES ENGINEERING

7.1. How We Contact You

At times, the School or your course convenor may need to contact you about your course or your enrolment. Your course convenor 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 these instructions on how to redirect your UNSW emails: https://www.it.unsw.edu.au/students/email/index.html

7.2. 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.microsoftcrmportals.com/webforms/

Course inquiries: these should be directed to the Course Convenor.

7.3. Computing Resources and Internet Access Requirements

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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

8. SCHOOL ASSESSMENT COVER SHEET

Course Convenor: _____
Course Code: _____ Course Title: _____
Assignment: _____
Due Date: _____
Student Name: _____ Student ID: _____

ACADEMIC REQUIREMENTS
Before submitting this assignment, the student is advised to review:

- the assessment requirements contained in the briefing document for the assignment;
- the various matters related to assessment in the relevant Course Outline; and
- the Plagiarism and Academic Integrity website at < http:/www.lc.unsw.edu.au/plagiarism/pintro.html > to ensure they are familiar with the requirements to provide appropriate acknowledgement of source materials.

If after reviewing this material there is any doubt about assessment requirements, then in the first instance the student should consult with the Course Convenor and then if necessary with the Director Undergraduate Studies.

While students are generally encouraged to work with other students to enhance learning, all assignments submitted for assessment must be their entire own work and do not acknowledge the use of other person's work or material. The student may be required to explain any or all parts of the assignment to the Course Convenor or other authorised persons. Plagiarism is using the work of others in whole or part without appropriate acknowledgement within the assignment in the required form. Collusion is where another person(s) assists in the preparation of a student's assignment without the consent or knowledge of the Course Convenor.

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