Faculty of Engineering

School of Minerals and Energy Resources Engineering

Course Outline

MINE/PTRL4951, 4952, 4953 (UG Research Thesis)

and

PTRL9451, 9452 ,9453 (PG Research Thesis B)

Dr Stuart Clark

Contents

1. INFORMATION ABOUT THE COURSE

1.1. Course Staff

Course Convenor	Dr Stuart Clark
Preferred Contact Method	Moodle Q&A Forums
Contact Email	Stuart.clark@unsw.edu.au
Consultation	By Appointment
Consultation types	In person (TETB 214)
	Skype

1.2. Course Description

The thesis provides an opportunity for you to bring together engineering principles learned over your previous years of study and apply these principles to innovatively solve problems such as the development of a specific design, process and/or the investigation of a hypothesis. Thesis projects are complex, open-ended problems that allow room for your creativity, and the acquisition, analysis and interpretation of results. There are multiple possible solutions or conclusions at the outset and sufficient complexity to require a degree of project planning. The thesis requires you to formulate problems in scientific or engineering terms, manage a technical project and find solutions by applying scientific and engineering methods. You will also develop their ability to work in a research and development environment. You must identify a supervisor and project prior to enrolling in the Research Thesis A course.

1.3. Course Completion

Each component of Research Thesis A, B and C has separate assessment components. Successful completion of Research Thesis A will be required to progress to B (or B and C if taken concurrently). Successful completion of Research Thesis A, B and C (MINE/PTRL4951,4952 and 4953 (UG) or PTRL9451,9452 and 9453 (PG)

B is required to progress to C. Only enrolment continuing grades (EC) will be given after A and B completion, if they are successful. When Thesis C is complete, the assessments for Thesis A, B and C will be added and the same mark will be applied to the three component courses. Course completion requires submission of all assessment items; failure to submit all assessment items can result in the award of an Unsatisfactory Failure (UF) grade for all three Thesis courses.

2. AIMS, LEARNING OUTCOMES AND GRADUATE ATTRIBUTES

2.1. Course Aims

Research thesis aims to deliver high quality, research-intensive experience for students who would like to explore an open-ended research question. Research thesis fulfils the key criteria in Level 8 - Bachelor Honours Degree and Level 9 - Masters Degree under the Australian Qualifications Framework.

2.2. Learning Outcomes

At the conclusion of this course, students should be able to:

LO1. Develop a design or a process or investigate a hypothesis following industry and professional engineering standards.

LO2. Critically reflect on a specialist body of knowledge related to their thesis topic.

LO3. Apply scientific and engineering methods to solve an engineering problem.

LO4. Analyse data objectively using quantitative and mathematical methods.

LO5. Demonstrate oral and written communication in professional and lay domains.

LO6. Complete a risk assessment associated with a project.

3. REFERENCE RESOURCES

The relevant resources will be provided by the supervisor however a general overview can be obtained from the following. For help with research and literature reviews, the UNSW library page is a great place to start. They also have research help zones to drop in an ask for help.

3.1. Moodle FAQ and Forums

The Moodle page should have a Frequently Asked Questions (FAQ) page and a forum. Seeking clarifying questions using the forums may get a faster response than using email. The answer you receive will also benefit other students.

3.2. Reference Materials

Resource	Webpage
UNSW Library – featuring research help zone and many other services!	UNSW Library Services
Scopus Literature Search	scopus.com
Google Scholar Literature Search	scholar.google.com.au

3.3. Online Materials

Your supervisor can provide you with a guide as to data sources and information, but the following societies, their data sources and journals might be of use to you:

Geoscience/Exploration Related:

- Geoscience Australia
- Australian Society of Exploration Geophysicists
- Society of Exploration Geophysicists
- European Association of Geoscientists & Engineers
- Earthbyte Group

Mining Related:

- Australasian Institute of Mining and Metallurgy
- Minerals Council of Australia

Petroleum Related:

- Petroleum Exploration Society of Australia (PESA)
- Society of Petroleum Engineers (SPE)
- American Association of Petroleum Geologists
- Australian Petroleum Production & Exploration Association
- American Petroleum Institute – For Petroleum Standards
- Society of Petrophysicists & Well Log Analysts
- OnePetro – online journals

3.4. Other Resources (if applicable)

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

- UNSW Learning Centre – great support for research, writing and presenting
- Counselling support – support to help you manage your mental wellbeing
- Library training and support services – support to help you navigate journals and library resources
- Zotero – online/offline free referencing tool to help you easily reference articles

3.5. Submission Styles and Templates

The Moodle site should have style guides, templates and introductory videos for each of the submission components for Research Thesis A, B and C. Please contact the Course Convenor if you require any assistance with these templates.

4. COURSE CONTENT AND LEARNING ACTIVITIES

In the first week, you are expected to identify a supervisor who will give you guidance and mentoring through the process of the Research Thesis. You, as the student, are expected to organise regular meetings with your supervisor, give her drafts of your work for her feedback and discuss the scope, resources and feasibility of your project with her. Should you fail to find a supervisor yourself, one will be allocated to you by the Course Convenor.

5. COURSE ASSESSMENT

5.1. Assessment Summary

Thesis	Assessment task	Due date / week	Weight	Assessment	Learning outcomes assessed
Thesis A	1	W1	N/A	Supervisor Approval Form	N/A
	2	W10	10%	Interim Report	LOs 1-2, 5-6
Thesis B	3	W10 (W3 if doing B and C together)	8%	Progress Report	LOs 3-6
	4	W10 (W3 if doing B and C together)	2%	Reflections Video	LOs 3-5
Thesis C	5	N/A	5%	Overall Participation Thesis A, B and C	All LOs
	6	W10	15%	Research Presentation	LOs 1-5
		W10	60%	Final Thesis Report	LOs 1-5

The weeks above are meant as a guideline for each term and only apply to the term enrolled. Actual dates for assignments are available on the Moodle site accessed via the Moodle icon on the MyUNSW homepage.

The following are the how the learning outcomes map to the assessments:

LO1. Develop a design or a process or investigate a hypothesis following industry and professional engineering standards is assessed in the Interim Report, Research Presentation and Final Thesis.

LO2. Critically reflect on a specialist body of knowledge related to their thesis topic is assessed in the Interim Report, Research Presentation and Final Thesis.

LO3. Apply scientific and engineering methods to solve an engineering problem is assessed in the Thesis B and C assessments.

LO4. Analyse data objectively using quantitative and mathematical methods is assessed in the Thesis B and C assessments.

LO5. Demonstrate oral and written communication in professional and lay domains is assessed in all assessments.

LO6. Complete a risk assessment associated with a project (Interim and Progress Reports)

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. Thesis A

Interim Report

Criterion	Rubric	Weighting
Literature Review	The student clearly answers what is the problem to be solved and what is its significance. Gaps in the literature should be explained and the hypotheses and aims clearly stated.	50%
Project Plan	The student clearly explains how they will answer the research question and how will they use their resources (time, computing power, laboratory equipment etc.) to answer the question in the time allocated. The student clearly indicates areas for which they will undertake training or upskilling.	20%
Risk Assessment	The student has shown a clear risk assessment of the feasibility of the different areas of the project. Preliminary results are indicated and knowledge about the tasks during the thesis, their relative importance, dependencies and likely success is used to show a high probability for success for the project.	20%
Document Presentation	The document is well presented with clear diagrams showing the progression of the project, milestones and dependencies. The document is well-written and citations are consistently and correctly formatted according to the guidelines.	10%

6.2. Thesis B

Progress Report and Updated Plan

Criterion	Rubric	Weighting
Progress Report	• Has training, upskilling and resources been acquired? • What results have been achieved so far? • How do the results fit with the literature gap identified in Thesis A?	70%
Updated Plan for the remainder of Thesis	• Proposed Solution/Experimental Methodology • Thesis timeline – for last term – noting changes • Justification of time allocation for each task • Available resources identified • Required training and upskilling identified	20%
Document Presentation	• Report or slide structure and layout • English skills – spelling, grammar • Data presentation (if applicable) • Clarity of writing • Citations consistent and correctly formatted	10%

Reflections Video

Criterion	Rubric	Weighting
Reflections on Progress	The student clearly articulates the learning achieved during the process and her enthusiasm for the topic and reflects upon the original hypothesis and the need for altering or clarifying it.	100%

6.3. Thesis C

Final Thesis Report

Criterion	Rubric	Weighting
Literature Review/Background	The student should be able to explain the broader context for the work, the rationale for doing it and how important it is.	10%
Execution of the Research Project	The work should be complete and well-reasoned with detailed and well explained results	50%
Conclusions and Value Added	The conclusions should logically follow from the results and be well reasoned. The work should be innovative in at least one respect: extending our knowledge, developing new methods or extending existing ones into new areas.	20%
Document presentation	• Report or slide structure and layout • English skills – spelling, grammar • Data presentation (if applicable) • Clarity of writing • Citations consistent and correctly formatted	20%

Participation Mark

Criterion	Rubric	Weighting
Participation	The student has communicated well, been well organised and has been the driving force behind the project. The student has contributed significantly in discussions with the supervisor and team members (if applicable).	10%

Research Presentation

Criterion	Rubric	Weighting

Context	The student should be able to explain the broader context for the work, the rationale for doing it and how important it is.	10%
Methods	The methods used should be concisely explained in a clear manner to a non-specialist engineer. The student should show a clear understanding of why the methods are applicable	30%
Results and Conclusions	The work should be innovative in at least one respect: extending our knowledge, developing new methods or extending existing ones into new areas.	20%
Presentation	The slide structure and layout should be clear and logical. Figures should be clear, legible and relate to the point at hand.	40%

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

7.1. 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 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/web-forms/

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

7.3. Computing Resources and Internet Access Requirements

UNSW Minerals and Energy Resources Engineering provides blended learning using the on-line Moodle LMS (Learning Management System). 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. 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

7.4. 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

7.5. Assignment Submissions

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.

7.6. Late Submission of an Assignment

Full marks for an assignment are only possible when an assignment is received by the due date.
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 following section. Late penalties will apply to submissions at a rate of 2% per day.

7.7. Special Consideration

You can apply for special consideration through UNSW Student Central when illness or other circumstances interfere with your assessment performance. Sickness, misadventure or other circumstances beyond your control may:

- Prevent you from completing a course requirement,
- Keep you from attending an assessable activity,
- Stop you submitting assessable work for a course,
- Significantly affect your performance in assessable work, be it a formal end-of-semester examination, a class test, a laboratory test, a seminar presentation or any other form of assessment.

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.

More details on special consideration can be found at: www.student.unsw.edu.au/special-consideration

7.8. 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:

- WD – which usually indicates you have not completed one or more items of assessment or 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 Convenor as soon as practicable but no later than five (5) days after release of the course result. If you don't contact the Course Convenor 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.

7.9. Students Needing Additional Support

The Student Equity and Disabilities Unit (SEADU) aims to provide all students with support and professional advice when circumstances may prevent students from achieving a successful university education. Take a look at their webpage: www.studentequity.unsw.edu.au/

7.10. Academic Honesty and Plagiarism

Your supervisor, the Course Convenor and the University 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.

If you need some additional support with your writing skills, please contact the Learning Centre or view some of the resources on their website: www.lc.unsw.edu.au/. The Learning Centre is designed to help you improve your academic writing and communication 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.

7.11. Continual Course Improvement

I encourage all students to share any questions or feedback they have at any time during the course, especially on the forums. But feel free to approach me to organise a meeting on skype or in person.

Good luck with the course!

Stuart Clark
Sydney, May, 2019