

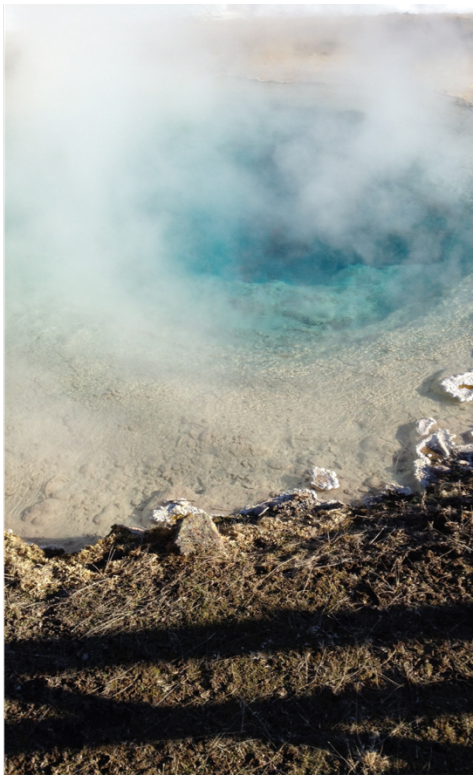

# PTRL5119
## Geothermal Engineering
Term 3, 2020

Professor Klaus Regenauer-Lieb
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## 1. INFORMATION ABOUT THE COURSE

| Course Code: | PTRL5119 | Trimester: | T3, 2020 | Level: | PG | Units/Credits | 6 UOC |
|---|---|---|---|---|---|---|---|
| Course Name: | Geothermal Engineering | | | | | | |

| Course Convenor: | ***Professor Klaus Regenauer-Lieb*** | | |
|---|---|---|---|
| Contact Details | School of Minerals and Energy Resources Engineering TETB 222 | EMAIL: | klaus@unsw.edu.au |
| | | Phone: | +61 2 9385 8005 |
| Contact times | Wednesday 12:00- 15:00 Online during and after Laboratory Class | | |

### 1.1. Course Description

(This course is an elective within a number of available coursework Programs within the School of Minerals and Energy Resources Engineering. Students must have satisfied any program-specific rules, prior to enrolling in this course). The course covers an introduction to geothermal energy and systems, geological elements of geothermal system, thermodynamics, fluid flow and geochemistry of geothermal systems and a final resources assessment of a geothermal prospect.

The opportunity for an assignment or an alternative research project will be given. The research project must be focused on a topic, which is predominantly of a **geothermal engineering context and can include appropriate geothermal exploration and modelling topics. It must include a significant component of investigation and analysis**.

Completion of this course is expected to require approximately 150 hrs of total student effort. The course is to be **conducted by coursework and assigments**.

### 1.2. Course Completion

**Expectations and Milestones**
The course must be undertaken entirely on an individual basis, unless prior approval is granted for an element of group investigation. All written elements of the assignment or project submissions must be prepared in accordance with the SPE style guide.

Course completion requires submission of all assessment items; failure to submit all the assessment items can result in the award of an Unsatisfactory Failure (UF) grade for the course. There is a minimum pass percentage required for every assessment and this is indicated in the assessment section of the course outline.

### 1.3. Assumed Knowledge

This course assumes that a student:

- is currently enrolled in a Minerals and Energy Resources Engineering postgraduate coursework program; and
- PTRL 5019 (Reservoir Engineering A)
- MATH1231 or MATH1241

### 1.4. Attendance

To pass this course it is expected that you will attend at least 80% of tutorials and lectures. *If your attendance is below 80% you will not be admitted to the final exam or pass the course*. Attendance will be recorded when applicable. Normally, there is no make-up work for poor attendance. If you have

misadventure or ill-health, please contact your course coordinator 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.

## 2. AIMS, LEARNING OUTCOMES AND GRADUATE ATTRIBUTES

### 2.1. Course Aims

This course aims to develop students' understanding of geothermal reservoir engineering its research management, planning, investigation and communication abilities in the field of geothermal reservoir engineering; and to demonstrate these abilities through the successful implementation and completion of a series of in class tutorials, assignment and a possible research project investigation and subsequent reporting.

### 2.2. Learning Outcomes

On successful completion of the course, it is expected that students will be able to:

1. Familiarity with basic concept of geothermal energy and systems engineering
2. Demonstrate initiative in identifying research needs and appropriate methodologies of investigation.
3. Successfully design, plan, implement and report on such investigations in a timely, structured, professional and logical manner.
4. Undertake research investigations in the field of geothermal reservoir engineering.
5. Be capable of responding to technical/professional questioning with respect to the project content, in a level appropriate to the skills expected of a mine site geotechnical engineer.

### 2.3. Graduate Attributes

This course will contribute to the development of the following Graduate Attributes:

1. appropriate technical knowledge
2. having advanced problem solving, analysis and synthesis skills with the ability to tolerate ambiguity
3. ability for engineering design and creativity
4. awareness of opportunities to add value through engineering and the need for continuous improvement
5. being able to work and communicate effectively across discipline boundaries
6. having HSEC consciousness
7. being active life-long learners.

## 3. REFERENCE RESOURCES

### 3.1. Reference Materials

- *SPE style guide* (downloadable from SPE)
- ***SPE Proceedings Paper Template*** *http://www.spe.org/authors/papers.php*
- *Geothermal Reservoir Engineering*. Malcolm A. Grant and Paul F. Bixley, 2nd edition Elsevier, Amsterdam (2011)

## 4. COURSE CONTENT AND LEARNING ACTIVITIES

### 4.1. Learning Activities Summary

Presentations and reading material are provided to provide students with technical information and examples of how geology and geophysical information is used at various stages of geothermal exploration.

Discussions will be used to encourage students to articulate and defend positions, consider different points of view and evaluate evidence. Case studies will be used to provide practice in identifying potential problems and evaluating alternative course of actions.

| UNSW Week | Assessment | Lectures/Content/Activities |
|---|---|---|
| 1 | | Introduction to geothermal energy and systems |
| 2 | | Geological elements of geothermal system |
| 3 | In-class tutorials (1%) | Thermodynamics of Geothermal Systems 1 |
| 4 | In-class tutorials (1%) | Thermodynamics of Geothermal Systems 2 |
| 5 | 25% | Mid-S Exam |
| 6 | No lecture | |
| 7 | In-class tutorials (4%) | MATLAB/Python based Geothermal Thermodynamics Examples Fluid Flow in Geothermal Systems |
| 8 | | Fluid Flow in Geothermal Systems |
| 9 | In-class tutorials (3%) | MATLAB/Python based Fluid Flow / Geochemistry Tutorial |
| 10 | In-class tutorials (1%) | Resources Assessment of Geothermal Reservoir |

**Total student effort hours:** Approx. 150

(Note: The above indication of "student effort hours" is indicative only – It reflects the anticipated level of total student involvement with the course – either through accessing or participating in online materials and activities; private research; preparation of assignments. Individual students may find their level of involvement differs from this schedule.)

## 5. COURSE ASSESSMENT

### 5.1. Assessment Summary

Assessment of this course is based on the submissions made at various project milestones over the course of the semester. Specific details of the requirements of the project milestones related to each item of assessment are identified in Section 1.2 of Course Outline (see above).

**Where applicable, all assessments are due by 12 noon Sydney time on the date indicated in the table below.**

| Assessment task | Due date | Weight | Total Marks | Assessment | Pass-Percentage |
|---|---|---|---|---|---|
| **A1** | Every class/lecture | 10% | 10 | In-class exercises | 7% |
| **A2** | Week 4 | 25% | 50 | Assignment 1 | 25% |
| **A3** | Week 5 | 25% | 100 | Assignment 2 | 50% |
| **A4** | Week 10 | 40% | 50 | Final Exam | 25% |

All the course information will be available online through Moodle. Access to the Moodle site is via the Moodle icon on the MyUNSW homepage, or at https://moodle.telt.unsw.edu.au

### 5.2. Assessment Requirements (If relevant)

***Who***

- ***All assessment items must be submitted to the Course Convenor.***

***When***

- If not otherwise stated, **the default deadline for submission of an assignment is 12:00 noon (Sydney time) on Monday in the nominated week**. If the Monday coincides with a Public Holiday then the due date is the next business day in the nominated week.
- In particular, the student should make sure they have read and understood the:
  - Declaration of Academic Integrity;
  - Assignment Submission requirements detailed in the *University Policies* section of the Course Outline; and
  - School Policy on *Assignment Submission* available on the School's website (the web address is given in the Course Outline). In particular note the requirement that only PDF documents should be uploaded and the required file naming convention.

***Where***

- *Submission of the final report or the assignment must be made electronically* through Turnitin in the LMS unless otherwise stated. Turnitin is a plagiarism checking service that will retain a copy of the assessment item on its database for the purpose of future plagiarism checking.
- For more guidance on Turnitin: https://student.unsw.edu.au/turnitin

***What***

- All submissions must be single document in PDF format; and
  - prepared in the form of a formal report that includes a list of reference sources cited in the report, prepared in accordance with the report writing standards of the School as contained in the *SPE style guide*

- Each submission must have appended:
    - to the front, a signed copy of the Student Declaration Form and Coversheet; and
    - (in the case of the final report), as the final included Appendix, a completed self-assessed copy of the Assessment Criteria (see Course Outline section 6.1).

***How***

- The submitted document must be consistent with the following file naming convention: < FamilyNameInitials_CourseCode_AssignmentNumber.pdf >.
- A typical compliant filename would take the following form < SmithPD_PTRL5199_A1.pdf > which elements correspond to:
    - Family name of student: Smith
    - Initial(s) of student: PD
    - Course Code: PTRL5119
    - Assignment number: A1...as defined in the Course Outline for the assessment task
    - File format: PDF document

## 5.3. Penalties for Non-Compliant Submission (If relevant)

A submission that is non-compliant with the School Policy on *Assignment Submission* and/or requirements as contained in this Course Outline may not be marked and/or penalty marks subtracted from the assignment mark for non-compliance.

Some examples of a non-compliant assignment include that the assignment submission:

- is not a single PDF document. *Penalty for non-compliance:* assignment not marked.
- does not contain a signed copy of the *Student Declaration Statement*. *Penalty for non-compliance:* assignment not marked.
- is not fully consistent with the designated file naming convention as listed above and defined as Item #6 in the School Policy on electronic submission. For example, a file name such as < ProjectProposal.pdf > is NOT compliant. *Penalty for non-compliance:* 10 marks.
- does not have appended at the end of the final project report assignment a completed self-assessment by the student of the assignment using the official *Assessment Criteria* template. *Penalty for non-compliance:* 10% of available mark.

## 6. ASSESSMENT CRITERIA

The following assessment criteria provide a guideline for students when preparing the assignments or the final report for the course as well as a guideline for assessors when marking an assignment. The student is advised to review the relevant framework before undertaking their assignment.

The criteria listed for each item of assessment and the descriptions contained therein are not intended to be prescriptive nor is it an exhaustive list. Rather it should be viewed as a framework to guide the student as to the type of information and depth of coverage that is expected to be evident in a submission for assessment; the framework illustrates for example what would distinguish an excellent achievement from a poor achievement.

The student should be cognisant that a range of factors is often being assessed in any one assignment; not just whether the final results are numerically correct. Consideration is given to other relevant elements that contribute to the *Learning Outcomes* of the course as well as the *Graduate Attributes* of the overall degree program.

*The student is cautioned against merely using the assessment criteria as a checklist.* When assessing an assignment, elements in the framework will be examined in terms of quality and creativity. Hence ensuring all the listed elements are merely covered in an assignment is often not sufficient in itself and will not automatically lead to full marks being awarded. Other factors such as how the student went about presenting information, how an argument was structured and/or the elements supporting a particular recommendation or outcome are also important.

Finally, the framework can also be used to provide feedback to a student on their performance in an assignment. Periodically the criteria are reviewed and updated; consequently, changes may be made from time to time to the framework to improve its effectiveness in achieving both these objectives.

### 6.1. Report Feedback

The following rubric will be used for assessment of any reports submitted as part of a project or assignment. Your report submissions should address the criteria in the rubric mentioned below. Please include a self-assessment for your final report using the below rubric.

# Assessment Criteria

*Student Name:* _____
*Assessed by:* _____

Marking of this project work was based on the following assessment criteria and weighting.

| Criteria | Excellent | Good | Satisfactory | Unsatisfactory | Poor | nil |
|---|---|---|---|---|---|---|
| **Abstract**<br>*Comments:*_____ | ☐Abstract is well written and accurately yet concisely captures all the essential aspects of the project objective, methodology, outcomes and issues | ☐Abstract is reasonably well written and captures most of the essential elements of the project | ☐Abstract is adequately written and captures most elements though missing some information | ☐Abstract is poorly written and does not clearly convey information concerning project topic, method, issues and/or outcomes | ☐Abstract is badly written and/or does not summarise the project topic and its outcomes | ☐Abstract is missing and/or largely incomplete |
| | 10 9 | 8 7 | 6 5 | 4 3 | 2 1 | 0 |
| **Introduction**<br>*Comments:*_____ | ☐Introduction provides a clear definition of the aims and objectives and, scope of project clearly identifies the relevance and significance of the project to the industry | ☐Introduction provides a good definition of the aims and objectives and scope of project identifies the relevance and significance to industry | ☐Introduction satisfactorily outlines the aims and objectives and/or provides a reasonable discussion of relevance and significance to industry | ☐Incomplete and/or unclear definition of project scope | ☐Project topic and scope are very unclear and/or confused | ☐Introduction is missing and/or largely incomplete |
| | 5 | 4 | 3 | 2 | 1 | 0 |

| Criteria | Excellent | Good | Satisfactory | Unsatisfactory | Poor | nil |
|---|---|---|---|---|---|---|
| **Background and methodology/ experimental procedures**<br>*Comments:* | extensive, relevant and logically organised review that critically analysed previous work on the topic and sets the scene for the research to be conducted<br>presented an excellent description of the research methodology and/or experimental procedure that was used to obtain data | relevant and logically organised review that critically analysed previous work on the topic and set the scene for the research to be conducted<br>presented a good description of the research methodology and/or experimental procedure that was used to obtain data | acceptable coverage of background material with some critical analysis applied that showed basic understanding of the topic<br>presented an acceptable description of the research methodology and/or experimental procedure that was used to obtain data | limited coverage of background material that lacked critical analysis. Some flaws in the basic understanding of this material was evident<br>presented a limited description of the research methodology and/or experimental procedure that was used to obtain data | extremely limited coverage of background material. A lack of understanding of the material in the topic area was evident<br>poor description of the research methodology and/or experimental procedure that was used to obtain data | critique of previous work is missing and/or largely incomplete<br>methodology and/or experimental procedures missing |
| | 10 9 | 8 7 | 6 5 | 4 3 | 2 1 | 0 |
| **Results and analysis**<br>*Comments:* | all relevant results are presented in a manner from which meaningful analyses and interpretations are drawn<br>good and creative approach to analysis of results interpreted against the stated objectives of the research | most results are presented in a manner from which meaningful analyses and interpretations are drawn<br>results are interpreted based on established approach relevant to stated objectives of the research | many results are presented in a manner from which meaningful analyses and interpretations are drawn<br>results are not interpreted against the stated objectives of the research. | some results are presented and some analysis and interpretations of these results are given<br>not aligned to the stated objectives of the research. | poorly presented some results and/or some results missing<br>little or no analysis or interpretation of results | no results presented and/or analysed |
| | 25 21 | 20 16 | 15 11 | 10 6 | 5 1 | 0 |

| Criteria | Excellent | Good | Satisfactory | Unsatisfactory | Poor | nil |
|---|---|---|---|---|---|---|
| **Quality of research and innovation in research process**<br>*Comments:* | approach highlights creativity and innovation, while working to an organised plan<br>actual execution of the work showed the application of knowledge gained from background research through relevant analysis of data to generate new knowledge. | approach is systematic and showed some innovation<br>actual execution of the work showed the application of knowledge gained from background research through analysis of data | approach is reasonably systematic.<br>actual execution of work showed some understanding via application of prior knowledge and some background research to produce limited analysis of data | approach is not well considered and does not flow logically from the background research presented<br>actual execution of work shows flawed understanding and little application of either background research or prior knowledge | approach is haphazard and has no logical basis<br>actual execution of the work shows very little understanding and little application of either background research or prior knowledge | little/no evidence of quality of research and innovation |
| | 20 19 | 18 15 | 14 10 | 9 5 | 5 1 | 0 |
| **Conclusions and recommendations**<br>*Comments:* | excellent, clear and concise summary of the outcomes of the research that demonstrates sound comprehension and insight into the significance of the results<br>excellent and appropriate recommendations for continuation and improvement of the research were discussed | good summary of the outcomes of the research that demonstrates comprehension and some insight into the significance of the results<br>some recommendations for continuation and improvement of the research were discussed | reasonable summary of the outcomes of the research that demonstrates some comprehension but limited insight into the significance of the results<br>limited recommendations for continuation and improvement of the research were discussed | summary of the outcomes of the research that demonstrates limited comprehension<br>few, inappropriate and/or irrelevant recommendations | fails to explain what was achieved with no real comprehension demonstrated | no conclusions and/or recommendations |
| | 10 9 | 8 7 | 6 5 | 4 3 | 2 1 | 0 |

| Criteria | Excellent | Good | Satisfactory | Unsatisfactory | Poor | nil |
|---|---|---|---|---|---|---|
| **Referencing**<br>*Comments:* | • all in-text citations are correct as per the *SPE style guide*<br>• all sources of information are referenced<br>• all listings in the References section are exactly in accord with the SPE standards as contained in the *SPE style guide*<br>• there are no missing References | • majority of in-text citations are correct with only a few minor errors<br>• majority of sources of information are referenced with few exceptions<br>• majority of listings in the References section are correct with only a few minor errors<br>• there are a few references missing from the References section | • most in-text citations are correct though there are several errors and/or some information is not referenced<br>• most listings in the References section are correct though there are several errors<br>• the References section is mostly complete | • limited/poor range of references and/or some are not appropriate to the topic<br>• many errors with in-text citations<br>• too little use of in-text citations and/or many instances of information not being properly referenced to identify source of information<br>• many errors with the listings in the References section<br>• the Reference section is incomplete/ missing some references | • too few references and/or most are not appropriate to the topic<br>• most in-text citations have errors<br>• little use of made of in-text citations to identify source of information<br>• most of the listings in the References section are incorrect<br>• there are many references missing from the References section | • there is no References section<br>• no in-text citation in thesis or, incorrect system of referencing is used<br>• incorrect system of listing in the References section |
| | 10 9 | 8 7 | 6 5 | 4 3 | 2 1 | 0 |

| Criteria | Excellent | Good | Satisfactory | Unsatisfactory | Poor | nil |
|---|---|---|---|---|---|---|
| **Standard of thesis presentation**<br>*Comments:* | • **structure** of thesis contains all required sections required and is in accord with *SPE*<br>• structure follows a logical progression<br>• **format** of thesis is completely in accord with the usual conventions of a thesis and the *SPE*<br>• use of tables, figures and equations is correct with no errors<br>• writing **style** is completely in accord with a thesis<br>• thesis has no spelling and grammatical errors, etc. | • structure of thesis is largely complete though it has a few minor errors<br>• format is largely in accord with *SPE* with a few minor errors<br>• use of tables, figures and equations is largely correct with only a few minor errors<br>• style is largely appropriate for a thesis with a few minor exceptions<br>• largely free of spelling and grammatical errors | • report structure is mostly correct and/or has some minor errors<br>• format is on the whole in accord with the *SPE* though it has several errors<br>• use of tables, figures and equations is mostly correct and/or there are several minor errors<br>• style is appropriate in most instances with some minor errors<br>• several minor spelling and grammatical errors | • several issues with thesis structure and/or many minor errors<br>• many issues with format of thesis as it deviates from *SPEG*<br>• some issues with use of tables, figures and/or equations in thesis<br>• writing style is inappropriate in many instances<br>• many instances of spelling and/or grammatical errors | • significant issues with thesis structure and/or many major errors<br>• thesis incomplete in sections with missing/gaps in information<br>• large number of significant major issues in format of thesis<br>• use of tables, figures and/or equations is largely inconsistent with *SPE*<br>• inappropriate writing style for a thesis<br>• unacceptable number of spelling and/or grammatical errors | • not presented as a thesis and/or not compliant with *SPE*<br>• significant amount of information missing from thesis<br>• most essential elements of thesis structure are missing and/or thesis has no logical structure<br>• format not in accord with the *SPE* standards<br>• use of tables, figures and/or equations is incorrect<br>• major issue with spelling and/or grammar |
| | 10 9 | 8 7 | 6 5 | 4 3 | 2 1 | 0 |

## 7. CONTACT AND GENERAL INFORMATION

### 7.1. How We Contact You

At times, the School or your supervisors may need to contact you about your course or your enrolment. Your lecturers will use the email function through 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: www.it.unsw.edu.au/students/zmail/redirect_external.html

(Note: We will not contact you by any other email account – it is your responsibility to access your @student.unsw email address, or Moodle).

### 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:
studentadministrativeservices@groups.unsw.edu.au

Course inquiries: these should be directed to the course convenor.

### 7.3. Computing Resources and Internet Access Requirements

UNSW provides blended learning using the on-line Moodle LMS (Learning Management System).

To run Moodle most effectively, you should have:

- broadband connection (256 Kbit/sec or faster)
- Chrome browser or FireFox
- ability to view streaming video (high or low definition UNSW The Box options)

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

It is also considered essential that you

- Upload a profile picture in Moodle LMS that can be used to verify your identity with your student ID photograph.
- If you have concerns about your web access for a course presented in distance mode, we would encourage you to contact the course convenor before the course commences, to discuss whether it will be possible for you to complete a distance course.

### 7.4. Accessing Course Materials through Moodle

Course outlines and support materials are uploaded on a Learning Management System (LMS) - Moodle. All enrolled students are automatically included on the Moodle for each course. To access these documents, please visit: www.moodle.telt.unsw.edu.au

### 7.5. Assessment Criteria for Postgraduate Programs

The assessment criteria provide a framework for you to assess your own work before formally submitting major assignments to your Course Convenor. Your Convenor will be using this framework to assess you work and as a way to assess whether you have met the listed learning outcomes and the graduate attributes for your program. All students are encouraged to take a closer look at this framework before, during and after completing an assignment.

The descriptions in the framework will help you and your facilitator to identify where your assignment is ranked – from excellent to poor achievement. We ask that you don't use the guidelines as a checklist, but as a tool to assess the quality of your work. Your facilitator will also be looking at the quality, creativity and the presentation of your written assignment as they review the framework.

## 7.6. Assignment Submissions

We encourage you to retain a copy of every assignment submitted for assessment for your own record either in hardcopy or electronic form. On a rare occasion, assignments may be mislaid and we may contact you to re-submit your assignment.

All your assignments will need to have a completed PG coversheet. To access a copy, please download the Cover Sheet

## 7.7. Late Submission of an Assignment

Full marks for an assignment are only possible when an assignment is received by the due date. In fairness to those students who do meet the assignment due date and time, deductions will apply to submissions made after this time.

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 as soon as possible: https://student.unsw.edu.au/special-consideration

In the case of the four assessment tasks, penalty marks will be applied at the following rate if submitted after the due date: five (5) percentile points of the maximum possible mark for each day or part thereof that the assessment is overdue.
For example if a student submitted the assignment five days after the due date and the unadjusted mark was 68% then the final adjustment mark for the assignment would be 43%-that is 68% (raw mark) less 25% (5 days @ 5% per day).

## 7.8. Course Results

For details on UNSW assessment policy, please visit: https://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 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-enrol in the course.

## 7.9. 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: https://www.student.unsw.edu.au/special-consideration

## 7.10. 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: http://www.studentequity.unsw.edu.au/

## 7.11. 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 https://www.student.unsw.edu.au/plagiarism.

All engineering 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 writing skills, please contact the Learning Centre or view some of the resources on their website: http://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.

## 7.12. Report Writing Guide for Geothermal Reservoir Engineers

The report writing guide (SPE) is available for all Minerals and Energy Resources Engineering students.
**Accessing the SPE Proceedings Paper Template** http://www.spe.org/authors/papers.php

## 7.13. Continual Course Improvement

At the end of each course, all students will have the opportunity to complete a course evaluation form. These anonymous surveys help us understand your views of the course, your lecturers and the course materials. We are continuously improving our courses based on student feedback, and your perspective is valuable.

We also encourage all students to share any feedback they have any time during the course – if you have a concern, please contact us immediately.