MINE4250 HARD ROCK MINE FEASIBILITY PROJECT

COURSE OUTLINE

SEMESTER 1, 2014
Course Details

Course Title: MINE4250 Hard Rock Mine Design and Feasibility

Semester Offered: Semester 1

Level: Undergraduate

Number of Units/Credits: 6 UOC

Course Convenor: Serkan Saydam. Room 159, 1st Floor Old Main Building
Telephone: 9385 4525; email: s.saydam@unsw.edu.au

Contact Hours per Week:

Four contact hours to be utilised for Project Based Learning.

Contact times are scheduled for
• Monday 9am – 1pm: OMB 145

Learning & Teaching Management System (LTMS): The Learning & Teaching Management System (LTMS) used with this course is Moodle which can be accessed at https://moodle.telt.unsw.edu.au.

For up to date information on lectures see the Calendar section in LTMS.

Support material for this course including, copies of lecture notes, recommended readings, assignments and results for assignments etc. whenever available can be found in LTMS.

All correspondence should be undertaken using the email facility within LTMS.

Changes in the lecture schedule, seminars, workshops and assignment dates will be posted on the Calendar in LTMS.

It is important that students regularly check LTMS for changes in calendar events and for email messages. It is strongly recommended that students use the mail redirection facility to forward LTMS emails to their usual email address.
Assessment
Assessments will take the form of two progress interviews, one final presentation and one final report.

Note: Course completion requires all assessment items be completed; failure to submit can result in non-completion of the Course

NOTE:
- Course completion requires all assessment items be completed otherwise a student can be awarded a grade of Unsatisfactory Fail.
- Students must attend at least 80% of course lectures in order for their mark in the formal exam to be counted towards their overall course mark.

Course Description

Development of a pre-feasibility study for a metalliferous mining project. Activities include: assessment of reserves, method selection, layout and optimisation of surface and underground operations, geotechnical design, ventilation design, project risk assessment, mine scheduling, equipment selection, cost estimation, economics/finance and sustainability. Usage of mine design and optimisation software packages.

Assumed Background

Students should have sufficient knowledge to apply the principles of resource geology, resource estimation, mine planning and design, surface and underground mining methods, minerals economics and equipment selection.
This course covers the following topics:

- Introduction of mine planning software tools
- Review and preparation of a resource block model
- Open pit design and optimisation procedures
- Underground mine layout and design
- Equipment selection
- Production and equipment scheduling
- Cost estimation
- Economic evaluation
- Ventilation design
- Geotechnical design
- Project evaluation
- Sustainable development (Risk, social, environmental, mine closure, legislations, etc.)
Course Aims

The aim of this course is to introduce students to the principles of mine feasibility studies for metalliferous mine deposit. In this course students should be able to develop skills for optimal mine design, scheduling and preparation of a pre-feasibility study document.

Learning Outcomes

It is intended that students will be able to:

1. Develop high level of mine design knowledge taking into account:
   - Data analysis and interpretation
   - Mine optimisation utilising geometrical, geotechnical and economical design parameters
   - Mine layout
   - Scheduling
2. Development and production planning, equipment selection,
3. Geomechanics and Ventilation,
4. Economic evaluation,
5. Learn and apply mine design and optimisation software packages,
6. Demonstrate team skills in the management of mining projects and advanced written and oral communication skills.

Graduate Attributes

This course will contribute to the development of the following graduate attributes:

- appropriate technical knowledge
- having advanced problem solving, analysis and synthesis skills with the ability to tolerate ambiguity
- ability for engineering design and creativity
- being able to think and work individually and in groups
- having HSEC consciousness
RECOMMENDED TEXTS AND RESOURCES

Recommended Texts

SME Mining Engineers Handbook, 1992, USA.

Reference Texts

- MEA Mine Planning Course Learning Guide
- MEA Mining Systems Course Learning Guide
- MEA Report Writing Guide
- MEA Resource Estimation and Project Evaluation Course Learning Guide

Software Tools

- Vulcan
- Whittle
- Deswick
- MS Excel
- TALPAC

Other Resources

Other material that should be referred to in conjunction with this Course Outline includes: Lecture Presentations will be available in Moodle weekly basis.

Online Resources

It is important that students regularly check Moodle for changes in calendar events and for messages. Many of the above reference books are available in the institution libraries.

In addition to the above texts, a number of selected readings are available to students in Moodle. These readings are either extracts/chapters from books, conference papers or articles from journals.

Selected readings as well as other supporting material (e.g. course outline and lecture notes will be made available on Moodle, the Learning & Teaching Management System (LTMS) accessed on-line at http://elearning.mea.edu.au/


## Learning Activities and Methods

### Learning Activities Summary

<table>
<thead>
<tr>
<th>-</th>
<th>Dates</th>
<th>Activity</th>
<th>Hours</th>
<th>Tasks</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1</strong></td>
<td>3 March</td>
<td>Course Introduction</td>
<td>4</td>
<td>Introduction to course</td>
<td>Introduction of the project.</td>
</tr>
<tr>
<td><strong>Week 2</strong></td>
<td>10 March</td>
<td>Project Work</td>
<td>4</td>
<td>Resource Model and Pit Optimisation</td>
<td>Review of resource model and data manipulation Pit optimisation and results analysis (ultimate pit limit, reserve estimation, pushback, and production schedule).</td>
</tr>
<tr>
<td><strong>Week 3</strong></td>
<td>17 March</td>
<td>Project Work</td>
<td>4</td>
<td>Pit Optimisation</td>
<td>Pit optimisation and results analysis (ultimate pit limit, reserve estimation, pushback, and production schedule). Deswick Q &amp; A Session @ OMB 145 between 9 AM to 4 PM Vulcan Training (13th and 14th March – All Day) on Open Pit Design</td>
</tr>
<tr>
<td><strong>Week 4</strong></td>
<td>24 March</td>
<td>Progress Interview 1</td>
<td>4</td>
<td>Progress Interview 1 (24th March - TBC)</td>
<td>Based on optimised pit model, estimate reserves and waste. Assess production rates and stripping ratios. Design progressive pits and haul roads. Ultimate pit design and waste dump design. Vulcan Training (27th and 28th March – All Day) on Underground Design</td>
</tr>
<tr>
<td><strong>Week 5</strong></td>
<td>31 March</td>
<td>Project Work</td>
<td>4</td>
<td>Underground Design and Layout</td>
<td>Underground mining strategy, mining method selection, stope sizing, reserve estimation. Selection of mine access and development of mining layout.</td>
</tr>
<tr>
<td><strong>Week 6</strong></td>
<td>7 April</td>
<td>From 10 Am to 12 Noon Guest Lecture – Prof Suorineni</td>
<td>4</td>
<td>Geotechnical Considerations</td>
<td>A review of geotechnical considerations in block cave mine design. Location: OMB 145</td>
</tr>
<tr>
<td><strong>Week 7</strong></td>
<td>28 April</td>
<td>Project Work</td>
<td>4</td>
<td>Underground design and layout Production and scheduling</td>
<td>Finalise your open pit and underground design Production rates and production scheduling for underground mine.</td>
</tr>
<tr>
<td><strong>Week 8</strong></td>
<td>5 May</td>
<td>Progress Interview 2</td>
<td>4</td>
<td>Progress Interview 2 (5th May - TBC)</td>
<td>Progress Interview 2 - Open Pit and Underground Design</td>
</tr>
<tr>
<td><strong>Week 9</strong></td>
<td>12 May</td>
<td>Project Work</td>
<td>4</td>
<td>Equipment selection, Ventilation and geotechnical design</td>
<td>Equipment selection for both open pit and underground mine (Fleet size, capacity, type, etc.). Ventisim simulation, roof support design, etc.</td>
</tr>
<tr>
<td><strong>Week 10</strong></td>
<td>19 May</td>
<td>Project Work</td>
<td>4</td>
<td>Cost estimation and economic evaluation</td>
<td>Capital and operating costs, production costs, sensitivity analysis, NPV, etc.</td>
</tr>
<tr>
<td><strong>Week 11</strong></td>
<td>26 May</td>
<td>Project Work</td>
<td>4</td>
<td>Sustainable development</td>
<td>Risk analysis, environmental and social impacts, mine closure, etc.</td>
</tr>
<tr>
<td><strong>Week 12</strong></td>
<td>2 June</td>
<td>Project Work</td>
<td>4</td>
<td>Presentation</td>
<td>Max 20 minute presentation by each group with more emphasis on the feasibility study. 4th June (All Day) – Presentations last Wednesday of the semester.</td>
</tr>
</tbody>
</table>

### Site Visit (TBC): Only two students from each group can attend the visit. The dates are subject to change based on the mine’s availability. Depart from Sydney on 13th April and return on 14th April (evening). Discussion on the project with site experts and underground visit. 14th to 18th April - NTW Only 2 students from each group will be visiting the mine. 21st to 25th April - Easter Holiday Break

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MINE4250 HARD ROCK MINE FEASIBILITY PROJECT
Notes:
- The *Course Week* does not always align with the Semester Week.
- The above schedule is a guide only and the indicated dates when each theme and course content is discussed is subject to change without notice.
- Additional guest lectures can be attended to the weekly activities.
- Students need to confirm the actual date of the formal exam for the course.

Assessment of Learning Outcomes

<table>
<thead>
<tr>
<th>Learning Outcomes</th>
<th>Assessment Methods</th>
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</thead>
<tbody>
<tr>
<td>Develop high level of mine design knowledge</td>
<td>Group report</td>
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<tr>
<td></td>
<td>Presentation</td>
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<td></td>
<td>Progress interviews</td>
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<tr>
<td>Learn and apply mine design and optimisation software packages to hard rock deposits</td>
<td>Group report</td>
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<tr>
<td></td>
<td>Presentation</td>
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<tr>
<td></td>
<td>Progress interviews</td>
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<tr>
<td>Demonstrate advanced written and presentation skills</td>
<td>Group report</td>
</tr>
<tr>
<td></td>
<td>Presentation</td>
</tr>
<tr>
<td>Demonstrate team skills in the management of a project work</td>
<td>Group project and report</td>
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<tr>
<td></td>
<td>Presentations</td>
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<td></td>
<td>Peer review</td>
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<tr>
<td></td>
<td>Progress interviews</td>
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</tbody>
</table>
Teaching & Learning Methods

Project-based learning
This course utilises project-based learning methods. Students will be given a comprehensive group projects to work on. Students are required to work in groups, share the project workload, and have weekly meetings and discussions.

Question/Answer sessions
Project work will be supported with weekly/bi-weekly Q/A sessions. All students are to attend these sessions.

Group work
Groups will be established by instructions from the course convenor. Each project will have a number of topics of emphasis. Each member of the group can elect to work on a topic of the project but all members must report their work to the group on weekly basis. A peer review will have to be submitted by each team, indicating the proportion of each individual group member's contribution to the project. Some marks will be taken from the underperforming students to others. If a student makes no contribution to the project, he/she will receive zero for that project.

Site Visit
Project will be supported for visiting Northparkes Mines at Parkes, NSW. The visit will include underground visit and project discussions with site experts.

Effective communication
One of the most effective means of learning is to effectively communicate what has been learned. Part of the assessment in this course will be determined by how effectively the results are communicated. The process of writing reports, brainstorming within a group, peer assessment, preparation and presentation of report, requires clarity of thinking, defending and revising a design and analysing the risks inherent in a project.
## Assessment Summary

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Due</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progress Interview 1</td>
<td>Week 4</td>
<td>10%</td>
</tr>
<tr>
<td>Progress Interview 2</td>
<td>Week 8</td>
<td>15%</td>
</tr>
<tr>
<td>Final Presentation</td>
<td>Week 12</td>
<td>25%</td>
</tr>
<tr>
<td>Final Hard Rock Mine Design Report</td>
<td>9th June Monday by 9 AM</td>
<td>50%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

- Electronic copies due by the 9th June, Monday 9 AM.
- Only electronic copies (MS Word doc) will be evaluated.
- The Final Presentation date may change due to the availability of the Board Members in Week 12. This will be finalised 2 weeks prior to the date.
- See the section on Group Work - Peer Assessment in the section on University Policies for further details on the requirements and process of peer assessment in-group project work.
ASSESSMENT CRITERIA

The following assessment criteria provide a framework or guideline that will be used when assessing the various major assignments in the course. The student is advised to review this framework before undertaking an 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 an assignment; the framework illustrates for example what would distinguish an excellent achievement from a poor achievement.

Hence the student should be cognisant that a range of factors are often being assessed in any one assignment; not just whether the final results are numerically correct or not. 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 elements are captured in an assignment is not sufficient and will not automatically lead to full marks being awarded. Other factors such as how the student went about presenting information, structuring an argument and/or supporting a particular recommendation or outcome are also important. Aside from being used as a guideline in preparing an assignment, 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 are made in order to improve their effectiveness in both of these tasks.

Note: Reference to RWG in the assessment criteria means the MEA Report Writing Guide.

Progress Interview 1 and 2

As per the course requirement,
- All the members of the team must be present (0 mark will be awarded to any member of the team who is not present),
- Interview will be conducted in the lab where the students need to show the progress of the project on the computer,
- Students will be expected to demonstrate ability to use software for the purposes of the design,
- Students are required to give a one-page write-up on the workload distribution for the project till date,
- This process will take about 10-15 minutes.

Presentations

Each group needs to provide the Course Convenor a copy of their Final Presentation before the start of the seminar in the morning. All students are required to attend and take part in the presentations for the whole seminar session. Absence from these presentations will only be allowed because of medical or extenuating circumstances. This will require documented evidence, e.g. Medical Certificate, etc. Final presentation will be 20 minutes long and be worth 25% of the overall mark. The room is equipped with projection facilities and students may use PowerPoint if they wish. However, it is the individual’s responsibility to ensure that the presentation is functioning beforehand. Computer problems will not be allowed to delay the proceedings!

The following criteria will be used for assessing the progress interviews, final presentation and the final report:
### Progress Interview 1 Assessment Criteria for Hard Rock Project Progress Presentations (10%)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent</th>
<th>Good</th>
<th>Satisfactory</th>
<th>Unsatisfactory</th>
<th>Poor</th>
<th>No meeting is held.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content Quality</strong> (60%)</td>
<td>Demonstrated comprehensive knowledge of the assumptions, resource estimation, ultimate pit limit, reserve estimation, pushback, and production schedule.</td>
<td>Demonstrated sound knowledge of the assumptions, resource estimation, ultimate pit limit, reserve estimation, pushback, and production schedule with minor errors.</td>
<td>Demonstrated an adequate knowledge of assumptions, resource estimation, ultimate pit limit, reserve estimation, pushback, and production schedule with some errors.</td>
<td>Demonstrated some knowledge of the assumptions, resource estimation, ultimate pit limit, reserve estimation, pushback, and production schedule with major errors.</td>
<td>Demonstrated limited or no knowledge of the assumptions, resource estimation, ultimate pit limit, reserve estimation, pushback, and production schedule.</td>
<td>No meeting is held.</td>
</tr>
<tr>
<td>Verbal Discussion and Answers for the questions (40%)</td>
<td>Clear presentation, presented with confidence and enthusiasm, well structured so that it flowed. Good answers for all the questions.</td>
<td>Clear presentation, slight lack of confidence, structure slightly erratic. Clear answers for all the questions.</td>
<td>Reasonable presentation that ensured the audience was informed of the topic, some structure used. Reasonable answers for all the questions.</td>
<td>Presentation difficult to follow due to erratic structure. Unsatisfactory answers for all the questions.</td>
<td>Poorly presented with little or no structure. Poor answers for all the questions.</td>
<td>No meeting is held.</td>
</tr>
</tbody>
</table>

**Score Ranges:**
- 60 50 49 40 39 30 29 15 14 1 0
### Hard Rock Project Progress Interview 2

**Progress Interview 2 Hard Rock Project Assessment Criteria (15%)**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent</th>
<th>Good</th>
<th>Satisfactory</th>
<th>Unsatisfactory</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Open Pit Design (30%)</strong></td>
<td>Provided a comprehensive study on design of progressive pits, haul roads and waste dump, estimation of reserves, waste and stripping ratios for each pushbacks and ultimate pit limits. Provided a surface infrastructure design.</td>
<td>Provided some study on design of progressive pits, haul roads and waste dump, estimation of reserves, waste and stripping ratios for each pushbacks and ultimate pit limits. Provided an acceptable surface infrastructure design.</td>
<td>Provided a limited study on design of progressive pits, haul roads and waste dump, estimation of reserves, waste and stripping ratios for each pushbacks and ultimate pit limits. Provided a limited surface infrastructure design.</td>
<td>Provided a limited or no technical study on design of progressive pits, haul roads and waste dump, estimation of reserves, waste and stripping ratios for each pushbacks and ultimate pit limits. Provided a limited or no surface infrastructure.</td>
<td>Provided no technical study on design of progressive pits and haul roads, estimation of reserves, waste and stripping ratios for each pushbacks and ultimate pit limits. Provided a limited or no surface infrastructure.</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>25</td>
<td>24</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td><strong>Underground Design (40%)</strong></td>
<td>Provided a comprehensive technical justification for the selected mining method, stope sizing, reserve estimation and an appropriate mine layout.</td>
<td>Provided some technical justification for the selected mining method, stope sizing, reserve estimation and an appropriate mine layout.</td>
<td>Provided a limited technical justification for the selected mining method, stope sizing, reserve estimation and an appropriate mine layout.</td>
<td>Provided a limited or no technical justification for the selected mining method, stope sizing, reserve estimation and an appropriate mine layout.</td>
<td>Provided no technical justification for the selected mining method, stope sizing, reserve estimation and an appropriate mine layout.</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>34</td>
<td>33</td>
<td>27</td>
<td>26</td>
</tr>
<tr>
<td><strong>Verbal Discussion and Answers for the questions (30%)</strong></td>
<td>Clear discussion, presented with confidence and enthusiasm, well structured so that it flowed. Good answers for all the questions</td>
<td>Clear discussion, slight lack of confidence, structure slightly erratic. Clear answers for all the questions</td>
<td>Reasonable discussion that ensured the audience were informed of the topic; some structure used. Reasonable answers for all the questions</td>
<td>Discussion difficult to follow due to erratic structure. Unsatisfactory answers for all the questions</td>
<td>Poor discussion with little or no structure. Poor answers for all the questions</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>25</td>
<td>24</td>
<td>20</td>
<td>19</td>
</tr>
</tbody>
</table>
## Final Hard Rock Project Report

### Final Report – Hard rock Project Assessment Criteria (50%)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Mark</th>
<th>Excellent</th>
<th>Good</th>
<th>Satisfactory</th>
<th>Unsatisfactory</th>
<th>Poor</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Executive Summary</strong></td>
<td>5%</td>
<td>Provided a comprehensive well-written summary of the project parameters and outcomes.</td>
<td>Provided an acceptable summary of the project parameters and outcomes.</td>
<td>Provided a limited summary of the project parameters and outcomes.</td>
<td>Provided a limited or poorly written summary of the project parameters and outcomes.</td>
<td>Provided a poorly written summary of the project parameters and outcomes.</td>
<td>No parameters and outcomes.</td>
</tr>
<tr>
<td><strong>Mine Planning and Design</strong></td>
<td>60%</td>
<td>Provided an excellent investigation and evaluation of the mine planning and design aspects.</td>
<td>Provided a good investigation and evaluation of the mine planning and design aspects.</td>
<td>Provided a satisfactory investigation and evaluation of the mine planning and design aspects.</td>
<td>Provided a limited investigation and evaluation of the mine planning and design aspects.</td>
<td>Provided a very limited investigation and evaluation of the mine planning design aspects.</td>
<td>Provided no work.</td>
</tr>
<tr>
<td><strong>Project Evaluation</strong></td>
<td>20%</td>
<td>Provided comprehensive cost estimates in terms of capital, operating and total production costs including an NPV estimate and a sensitivity analysis.</td>
<td>Provided comprehensive cost estimates in terms of capital, operating and total production costs including an NPV estimate and a sensitivity analysis with minor errors.</td>
<td>Provided sound cost estimates in terms of capital, operating and total production costs. No sensitivity analysis provided.</td>
<td>Provided some cost estimates but with major errors.</td>
<td>Provided a limited cost estimates with major errors.</td>
<td>Provided no cost analysis.</td>
</tr>
<tr>
<td><strong>Conclusions</strong></td>
<td>5%</td>
<td>The analysis of the work conducted highlights your comprehension and shows insight into the significance of the results. The report concludes with a clear concise summary of the outcomes and includes qualification.</td>
<td>The analysis of the work conducted demonstrates some comprehension. The report concludes with a summary of outcomes.</td>
<td>The analysis of the work conducted demonstrates limited comprehension. The report concludes with some summary of outcomes.</td>
<td>The analysis of the work conducted demonstrates limited or no comprehension. The report concludes with a poor summary of outcomes.</td>
<td>The analysis of the work conducted demonstrates lack of comprehension. The report concludes with a poor summary of outcomes.</td>
<td>No conclusions drawn from the analysis.</td>
</tr>
<tr>
<td><strong>Layout and Standard of Report</strong></td>
<td>10%</td>
<td>Very good logical structure, physical layout and attention to detail. The work is presented in an accurate and coherent fashion. Scientific and technical style. No or few spelling mistakes or grammatical errors. Appropriate referencing.</td>
<td>Acceptable structure and physical layout; Some inaccuracies or lack of detail in presentation of work. Neat, some spelling mistakes or grammatical errors. Some errors in referencing.</td>
<td>Structure and physical layout detract; a few inaccuracies or minor lack of detail in presentation of work. A few spelling mistakes or grammatical errors. A few errors in referencing.</td>
<td>Structure and physical layout detract; many inaccuracies or considerable lack of detail in presentation of work. Several spelling mistakes or grammatical errors. Several errors in referencing.</td>
<td>Structure and physical layout detract; many inaccuracies and complete lack of detail in presentation of work. Numerous spelling mistakes or grammatical errors. Several errors in referencing.</td>
<td>No report submitted. Very poor layout</td>
</tr>
</tbody>
</table>
Final Project Presentation Assessment Criteria

As per the course requirement, each group member needs to present on the day of the presentation. Presentations will be 20 minutes long and be worth 25% of the project overall mark. All students are required to attend and take part in the presentations for the whole seminar session. Every student in the group is required to be present during the progress and the final presentations. Absence from these presentations will only be allowed because of medical or extenuating circumstances. This will require documented evidence, e.g. Medical Certificate, etc.

The room is equipped with projection facilities and students may use PowerPoint if they wish. However, it is the individual’s responsibility to ensure that the presentation is loaded up and functioning beforehand. Computer problems will not be allowed to delay the proceedings!

The following criteria will be used for assessing presentations (25% of total project mark):
# Group Project Assessment Criteria for Hard Rock Project Presentations (25%)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Mark</th>
<th>Excellent</th>
<th>Good</th>
<th>Satisfactory</th>
<th>Unsatisfactory</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>10%</td>
<td>Provided a comprehensive overview of the presentation and objective[s] of the project. Some points not clearly presented.</td>
<td>Provided a good overview of the presentation and objective[s] of the project.</td>
<td>Provided a general overview of the presentation and objectives of the project but lacks clarity.</td>
<td>Provided a limited overview of the presentation and objectives of the project but lacks clarity.</td>
<td>Provided little or no overview of the presentation and limited or no objectives of the project. Provided no background to presentation.</td>
</tr>
<tr>
<td><strong>Content Quality</strong></td>
<td>50%</td>
<td>Demonstrated comprehensive knowledge of resource estimation, mining strategy, mine design, layout and optimisation, mining Production Scheduling, Equipment Selection, Ventilation Design, Geotechnical Design. Ability to answer the questions correctly.</td>
<td>Demonstrated sound knowledge of resource estimation, mining strategy, mine design, layout and optimisation, mining Production Scheduling, Equipment Selection, Ventilation Design, Geotechnical Design with minor errors. Acceptable ability to answer the questions.</td>
<td>Demonstrated an adequate knowledge of resource estimation, mining strategy, mine design, layout and optimisation, mining Production Scheduling, Equipment Selection, Ventilation Design, Geotechnical Design with some errors. Adequate ability to answer the questions.</td>
<td>Demonstrated some knowledge of resource estimation, mining strategy, mine design, layout and optimisation, mining Production Scheduling, Equipment Selection, Ventilation Design, Geotechnical Design with major errors. Some ability to answer the questions.</td>
<td>Demonstrated limited or no knowledge of resource estimation, mining strategy, mine design, layout and optimisation, mining Production Scheduling, Equipment Selection, Ventilation Design, Geotechnical Design. Limited ability to answer the questions. Content missing. No ability to answer the questions.</td>
</tr>
<tr>
<td><strong>Conclusion</strong></td>
<td>10%</td>
<td>The analysis of the work conducted highlights your comprehension and shows insight into the significance of the results. Concise and appropriate conclusions, excellent and valid response to questions.</td>
<td>The analysis of the work conducted demonstrates good comprehension. Good conclusions, appropriate and valid response to questions.</td>
<td>The analysis of the work conducted demonstrates some comprehension. Reasonable conclusions, appropriate and valid response to questions.</td>
<td>The analysis of the work conducted demonstrates limited comprehension. Unreasonable conclusions, barely appropriate and valid response to questions.</td>
<td>The analysis of the work conducted demonstrates no comprehension. Invalid conclusions, barely appropriate and valid response to questions. Conclusion missing.</td>
</tr>
<tr>
<td><strong>Visual Aids Quality</strong></td>
<td>10%</td>
<td>Slides easy to read with appropriate sized graphs, wording etc and no errors on slides.</td>
<td>Slides easy to read with appropriate sized graphs, wording etc and only minor errors</td>
<td>Slides legible but with some errors in formatting, wording, sizing etc.</td>
<td>Slides difficult to read.</td>
<td>Slides inappropriate with major mistakes. Slides totally illegible.</td>
</tr>
<tr>
<td><strong>Verbal Presentation</strong></td>
<td>20%</td>
<td>Clear presentation, presented with confidence and enthusiasm, well structured so that it flowed.</td>
<td>Clear presentation, slight lack of confidence, structure slightly erratic.</td>
<td>Reasonable presentation that ensured the audience was informed of the topic, some structure used.</td>
<td>Presentation difficult to follow due to erratic structure.</td>
<td>Poorly presented with little or no structure. Inaudible presentation.</td>
</tr>
</tbody>
</table>
Assignment Submissions

All assignments submitted for assessment in this course must be made in accordance with the School Policy on Assignment Submissions, hereafter in this subsection termed the Policy. Details of the Policy can be found in the School Policies section of the School webpage at http://www.engineering.unsw.edu.au/mining-engineering/assignment-submission-policy.

Students are required to read the latest version of the Policy and be aware of the various requirements including submission requirements and academic integrity. Failure to adhere to the requirement and/or submit an assignment that is fully compliant with the Policy may result in forfeiture by the student of all marks for that assignment.

An Assignment Coversheet must be attached to each assignment submitted for assessment whether the assignment is submitted in electronic or hardcopy form. The coversheet identifies the student, assignment, course and contains a declaration of academic integrity – see later section on Academic Honesty and Plagiarism. Assignments not containing a fully completed copy of the official coversheet for the assignment will be deemed non-compliant and not marked resulting in the student will be awarded zero marks for the assignment.

By default all assignments for courses in the School must be submitted as an electronic document. The submission requirements for electronic submissions are detailed in the Policy.

In the case where a hardcopy submission of an assignment has been permitted in the assignment briefing document then the submission requirements for hardcopy submissions as detailed in the Policy must be followed. The student must attach to the front of the assignment a completed and signed copy of the Assignment Coversheet.

Students are advised to retain a copy of every assignment submitted for assessment for their own record either in hardcopy or electronic form. From time to time assignments may be mislaid and a student can be asked to re-submit.

Group Work – Peer Assessment

Group work is a key Graduate Attribute in the Mining Engineering program. As such it is integrated into the assessment activities of many courses to determine whether a student has satisfactorily attained one or more of the Learning Outcomes.

An important indicator of a student’s performance and of their contribution to the group’s overall performance is reflected in the results of a formalised system of peer review. The Course Convenor uses these results and other factors in their determination of an individual student’s result for the assignment.

For further details see Peer Assessment in the School Policies section at
Students should be aware that participation in the peer review process is compulsory and that failure to do so can result in withholding of marks and/or zero marks being allotted to the student for that assignment.

**Late Submission of an Assignment**

In the normal course of events *late submission of an assignment will automatically result in a zero mark being awarded to the student/project team for the assignment.*

The onus is on the student to ensure each course assignment is submitted on-time during normal business hours and no later than the required time on the due date as stated in the relevant assignment briefing document.

For further details see Late Submissions in the School Policies section on the School webpage at [http://www.engineering.unsw.edu.au/mining-engineering/late-submissions](http://www.engineering.unsw.edu.au/mining-engineering/late-submissions). See also the later section on Adverse Performance – Special Consideration.

**Course Results**


In some instances a student’s final course result may be withheld and not released on the usual date. This is indicated by a course grade result of either:

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

In either event the onus is on the student to contact the Course Convenor as soon as practicable but **no later than five (5) days** after release of the course result. Failure to take this action will normally result in forfeiture of any additional assessment granted to the student. In which case the student may be required to re-submit an assignment or re-sit the final exam. Failure to contact the Course Convenor within the stated period may result in the student failing the course.

If contact has not been made and/or course assessment has not been finalised by commencement of the following academic semester then the grade will be automatically altered to a course grade of **NC** (course not completed) in Week 2. This will require the student to re-enrol in the course at some later time.

For details on assessment policy, assessment process and an explanation of course results, see the Assessment Policy at [https://my.unsw.edu.au/student/academiclife/assessment/AssessmentatUNSW.html](https://my.unsw.edu.au/student/academiclife/assessment/AssessmentatUNSW.html).
Adverse Performance – Special Consideration

In cases of illness or other extenuating circumstances that may have adversely impacted on a student’s performance in a course, it is recommended the student apply to Student Central for Special Consideration.

It is incumbent on the student to contact the Course Convenor immediately following lodgement and acceptance of the Special Consideration preferably in person and no later than one week from lodgement. Failure to make contact can result in forfeiture for any consideration and subsequent finalisation of the mark for the assignment and/or course.

Only following acceptance and official notification from the University, will any decision be made by the Course Convenor as to an appropriate response based the circumstances outlined by the student.

For further information, see Special Consideration policy at https://my.unsw.edu.au/student/atoz/SpecialConsideration.html.

Academic Honesty and Plagiarism

The University has certain expectations in terms of academic behaviour related to study and research. This is expressed in the University Policy on Academic Misconduct. Students should be aware of and understand this Policy. For further information, see Plagiarism and Academic Integrity policy at https://student.unsw.edu.au/plagiarism.

Plagiarism is one form of Academic Misconduct. It is the presentation of the thoughts or work of another as one’s own

- direct duplication of the thoughts or work of another, including by copying work, or knowingly permitting it to be copied. This includes copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person’s assignment without appropriate acknowledgement;
- paraphrasing another person’s work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and,
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.

1 Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle.

2 Adapted with kind permission from the University of Melbourne.
Submitting an assessment item that has already been submitted for academic credit elsewhere may also be considered plagiarism.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does not amount to plagiarism.

Students are reminded of their Rights and Responsibilities in respect of plagiarism, as set out in the University Undergraduate and Postgraduate Handbooks, and are encouraged to seek advice from academic staff whenever necessary to ensure they avoid plagiarism in all its forms.

The Learning Centre at the University provides academic support services to students. Details about The Learning Centre is available at www.lc.unsw.edu.au.

It provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- correct referencing practices;
- paraphrasing, summarising, essay writing, and time management;
- appropriate use of and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre.

Students are 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 items.

In line with this university expectation, a student must attach to each assignment a fully completed official coversheet which contains a declaration of academic integrity. The following is an extract from an assignment coversheet.

**Extract from an Assignment Coversheet**

**ACADEMIC REQUIREMENTS**

Before submitting this assignment, students are 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 by a student must be their entire own work and they may be required to explain any or all parts of the assignment to the Course Convenor or other authorised persons. *Collusion* is where another person(s) assists in the preparation of an assignment without the consent or knowledge of the Course Convenor.

Plagiarism and Collusion are considered as Academic Misconduct and will be dealt with according to University Policy.
STUDENT DECLARATION OF ACADEMIC INTEGRITY
I declare that:

- This assessment item is entirely my own original work, except where I have acknowledged use of source material [such as books, journal articles, other published material, the Internet, and the work of other student/s or any other person/s].
- This assessment item has not been submitted for assessment for academic credit in this, or any other course, at UNSW or elsewhere.

I understand that:

- The assessor of this assessment item may, for the purpose of assessing this item, reproduce this assessment item and provide a copy to another member of the University.
- The assessor may communicate a copy of this assessment item to a plagiarism checking service (which may then retain a copy of the assessment item on its database for the purpose of future plagiarism checking).

Continual Course Improvement

Periodically the process of course evaluation is undertaken. One aspect of this evaluation is feedback from students gathered by various means including:

- UNSW's Course and Teaching Evaluation and Improvement (CATEI) which is an anonymous, on-line survey system.

Student feedback is taken seriously, and continual improvements are made to the course based in part on such feedback.

Significant changes that are made to a course as a result of such student feedback will be communicated to students by the Course Convenor at commencement of semester when the course is next run.

Correspondence and Email Messages

University policy states that official correspondence with a student will be made using the university provided email address and that it expects students will regularly check their official university email account. The School assists in this by providing free access to computing facilities and the internet.

In line with this policy, messages will be sent to students through their LTMS account. Students can retrieve messages from the mailbox in each LTMS course account.

Administrative Matters

Students should ensure they are familiar with the various policies related to expectations of students. Links to the Policies can be found on the School web page at www.mining.unsw.edu.au/information-about/our-school/policies-procedures-guidelines.

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 convenor prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (www.equity.unsw.edu.au/disabil.htm).
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. Information on designing courses and course outlines that take into account the needs of students with disabilities can be found at www.secretariat.unsw.edu.au/acboardcom/minutes/coe/disabilityguidelines.pdf.