1. INFORMATION ABOUT THE COURSE

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>MINE4510</th>
<th>Semester:</th>
<th>S1, 2016</th>
<th>Level:</th>
<th>UG</th>
<th>Units/Credits:</th>
<th>6 UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Name:</td>
<td>Advanced Mine Ventilation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Convenor:</th>
<th>Duncan Chalmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Details</td>
<td>School of Mining Engineering Old Main Building, Rm 159B EMAIL: <a href="mailto:d.chalmers@unsw.edu.au">d.chalmers@unsw.edu.au</a> Phone: +61 2 9385 5727</td>
</tr>
</tbody>
</table>
| Contact times    | Contact times are scheduled for:  
  - Monday 15:00 – 17:00, BUS 205  
  - Wednesday 12:00 – 14:00 BUS 232 |

1.1. Course Description

This course applies ventilation principles to the design of underground mines and enables the ventilation requirements for underground mining methods to be met. Students work in teams as they would in a mine planning office to complete two design projects that are focused on the ventilation requirements of the mine in question. The projects are structured in such a way as to lead each team through the processes that are required. There are no formal lectures and contact with the Course Convenor is one of supervision to ensure successful completion of the projects.

In addition to the two major projects, a site visit where ventilation techniques and data collection is practiced. A minor report completes this visit where the student provides a summary of the learnings from the visit. The visit is structured around a ventilation survey.

The course is only offered in the first semester of each academic year.

1.2. Course Completion

Course completion requires:

- submission of all assessment items; failure to submit all assessment items will result in the award of an Unsatisfactory Failure (UF) grade for the Course.
- Attendance at the underground visit
- submission of Project Plan to the Course Convenor. The student group must make an appointment with the Course Convenor to discuss the outcomes and any changes required to the Project Plan

1.3. Assumed Knowledge

This course assumes that a student:

- is currently enrolled in the Mining Engineering single degree program or a Mining Engineering double degree program at UNSW; and
- has satisfactorily completed all the courses in Stages 1 to 3 of the Mining Engineering single degree program or equivalent in the Mining Engineering double degree program and is in the Stage/Year of the program; and
- has successfully completed MINE 3510 Underground Mine Environment and MINE3430 Mining Systems; and
- each student has a sound knowledge of mining terms and systems.
2. AIMS, LEARNING OUTCOMES AND GRADUATE ATTRIBUTES

2.1. Course Aims
This course provides an opportunity to apply theoretical knowledge in the practical application of ventilation design for underground mining methods. This assists in the development of engineering skills that are needed to work in a design team.

2.2. Learning Outcomes
At the conclusion of this course, it is intended that the students will be able to:

1. Apply ventilation principles to mine design
2. Quantify ventilation requirements
3. Identify risks associate with ventilation management
4. Identify controls to manage ventilation
5. Write comprehensive reports
6. Demonstrate practical skill necessary to undertake an underground ventilation survey together with necessary documentation, analysis and interpretation of results.
7. Demonstrate the application of advanced network analysis to ventilation systems, including thermodynamic aspects.
8. Determine fan / system performance and specification of requirements in complex coal and metalliferous ventilation systems, including trouble shooting and problem solving.
9. Identify the requirements, and issues associated with, the application of appropriate ventilation monitoring systems in both coal and metalliferous mines.
10. Develop ventilation designs for a coal mine and a metalliferous mine,
11. Identify the requirements of appropriate management plans for the designed systems.

2.3. BE (Hons) Program Learning Outcomes

1. Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.
2. Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.
3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.
4. Discernment of knowledge development and research directions within the engineering discipline.
5. Knowledge of engineering design practice and contextual factors impacting the engineering discipline.
6. Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.
7. Application of established engineering methods to complex engineering problem solving.
8. Fluent application of engineering techniques, tools and resources.
10. Application of systematic approaches to the conduct and management of engineering projects.
11. Ethical conduct and professional accountability.
12. Effective oral and written communication in professional and lay domains.
13. Creative, innovative and pro-active demeanour.
14. Professional use and management of information.
15. Orderly management of self, and professional conduct.
16. Effective team membership and team leadership.
2.4. 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

- *Le Roux’s Notes on Environmental Engineering*
- *Mine Ventilation and Air Conditioning*
- *Environmental Engineering in South African Mines*
- *Mine Fires in Australian Underground Coal Mines*
- *Spontaneous Combustion in Australian Underground Coal Mines*
- *MEA Report Writing Guide for Mining Engineers*. P Hagan and P Mort (Mining Education Australia (MEA)). (Latest edition available for download from the School website or a hardcopy version is available from the UNSW Bookshop)
- *Guide to Authors*. (Australasian Institute of Mining and Metallurgy: Melbourne) (Available for download from the AusIMM website)

3.2. Other Resources

- MINE3510 Course materials. E.g. Notes, Spreadsheets, Learning Guide
- EndNote, software package available to UNSW students
- ELISE, the on-line study skills tutorial and ELISE Plus. Both tutorials will be useful to students when preparing the Annotated Bibliography and Project Progress Report assignment submissions. The latter in particular includes a tutorial on EndNote and Refworks. The tutorials can be accessed at <http://info.library.unsw.edu.au/skills/tutorials.html>.

3.3. Online Resources

Selected supporting material e.g. course outline and additional work files will be made available on LMS.

3.4. Software and Hardware

- Ventsim, Microsoft Office
4. COURSE CONTENT AND LEARNING ACTIVITIES

4.1. Learning Activities Summary

<table>
<thead>
<tr>
<th>Week</th>
<th>Week Starting</th>
<th>Hrs</th>
<th>Topic</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-6</td>
<td>29 February to 11 April</td>
<td>29</td>
<td>Coal Project</td>
<td>Introduction to project/ Formation of Groups</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Development of Project plan/ Group work</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Development of Project/ progress summary</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Development of Project</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Report writing/ presentation preparation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Report Submission / Presentation of Findings</td>
</tr>
<tr>
<td>7-12</td>
<td>18 April-1st June</td>
<td>18</td>
<td>Metal Project</td>
<td>Introduction to project/ Formation of Groups</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Development of Project plan/ Group work</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Development of Project/ progress summary</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Development of Project</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Report writing/ presentation preparation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Report Submission / Presentation of Findings</td>
</tr>
<tr>
<td>TBA</td>
<td>1 Day Underground Visit</td>
<td>1</td>
<td></td>
<td>Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Implement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Report</td>
</tr>
</tbody>
</table>

4.2. Total student effort hours:

Approx. 48 (plus 1 full day in an underground mine)

(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.

Note: Attendance at the Mine exercise is compulsory. The visit will be arranged to maximize the opportunity for all students to participate. Sporting injuries over the break may delay the scheduling of this assessment and is arranged in discussion with all parties. Mine availability will also dictate the scheduling.)
5. COURSE ASSESSMENT

5.1. Assessment Summary

Assessment of the research project is based on the submissions made at various project milestones over the course of the year. Specific details of the requirements of the project milestones related to each item of assessment are contained in the Each Project Outline.

All assessments are due 12 noon Sydney time on Monday of the week, unless otherwise indicated in the table below.

<table>
<thead>
<tr>
<th>Assessment task</th>
<th>Due date</th>
<th>Release date</th>
<th>Weight (%)</th>
<th>Assessment</th>
<th>Learning outcomes assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11 April</td>
<td>29 Feb</td>
<td>25</td>
<td>Group Report (max. 75 pages)</td>
<td>1-5, 7-11</td>
</tr>
<tr>
<td>2</td>
<td>11 April</td>
<td>29 Mar</td>
<td>15</td>
<td>Group Project Presentation (20 min) in allocated contact time</td>
<td>7-11</td>
</tr>
<tr>
<td>3</td>
<td>Ongoing</td>
<td>29 Feb</td>
<td>10</td>
<td>Demonstration of Progress</td>
<td>1, 2,3,4</td>
</tr>
<tr>
<td>4</td>
<td>30 May</td>
<td>18 April</td>
<td>25</td>
<td>Group Report (max. 50 pages)</td>
<td>1-5, 7-11</td>
</tr>
<tr>
<td>5</td>
<td>1 June</td>
<td>4 Apr</td>
<td>15</td>
<td>Group Project Presentation (20 min) in allocated contact time</td>
<td>7,-11</td>
</tr>
<tr>
<td>6</td>
<td>TBA</td>
<td>TBA</td>
<td>10</td>
<td>Individual report (max. 2000 words) 1 week after the site visit</td>
<td>6</td>
</tr>
</tbody>
</table>

All the course materials and assignments 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

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 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.
- Early submission is required in cases where the student will otherwise be absent on the due date of submission, for example to attend the Student Mining Games, a graduate employment interview etc. – no extensions will be granted.
- Prior to submission, students should read the School Policy on Assignment Submissions which can be viewed at: < www.mining.unsw.edu.au/information-about/our-school/policies-procedures-guidelines >.
- 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

- Submissions must be made electronically through Turnitin in the LTMS 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.

What

- Submission requirements for each assignment is listed the Assignment Brief
- The Report submissions must be:
  - a 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 MEA Report Writing Guide for Mining Engineers. A copy can be obtained from the UNSW Bookshop or downloaded from the School webpage.
- Each submission must have appended:
  - to the front, a signed copy of the Student Declaration Form and Coversheet.
- It is strongly recommended when preparing the major assignment; students use the Report Template available from LTMS. Note: as this template already incorporates the required the Student Declaration Form, a student does not need to separately append a signed copy of coversheet to their assignment.

5.3. Assessment Process

Each Project is well defined. Tasks are provided as guidance as to what is required in the report. Evaluation of each report will be based on how well each task has been addressed. Identification weaknesses in the project and the limitations of the report are essential. As each project has more than one solution, marks are awarded on the basis of the demonstrated technical support of the proffered solution. Groups should be aware that the process is to develop an case that is presented at the end of each project.
6. ASSESSMENT CRITERIA

The following assessment criteria provide a framework for students when preparing major assignments in 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.

Note: Reference to RWG in the assessment criteria refers to the MEA Report Writing Guide, and GTA to the AusIMM Guide to Authors.
6.1. Project Report

The assessment criteria and relative weighting that will be used in assessing the Project Report is summarised in the following table.

<table>
<thead>
<tr>
<th>Assessment Criteria – Project Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria</td>
</tr>
<tr>
<td>-------------------------------------</td>
</tr>
<tr>
<td><strong>Executive Summary</strong></td>
</tr>
<tr>
<td><strong>Ventilation Design</strong></td>
</tr>
<tr>
<td><strong>Project Evaluation</strong></td>
</tr>
<tr>
<td><strong>Conclusions</strong></td>
</tr>
<tr>
<td><strong>Layout and Standard of report presentation</strong></td>
</tr>
<tr>
<td><strong>nil</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Criteria</th>
<th>60</th>
<th>50</th>
<th>49</th>
<th>40</th>
<th>39</th>
<th>30</th>
<th>29</th>
<th>20</th>
<th>19</th>
<th>10</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ventilation Design</strong></td>
<td>60</td>
<td>50</td>
<td>49</td>
<td>40</td>
<td>39</td>
<td>30</td>
<td>29</td>
<td>20</td>
<td>19</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td><strong>Project Evaluation</strong></td>
<td>20</td>
<td>25</td>
<td>24</td>
<td>15</td>
<td>14</td>
<td>9</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Conclusions</strong></td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Layout and Standard of report presentation</strong></td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
6.2. Consultation with Supervisor

The assessment criteria and weighting that will be used in assessing the quality of the student consultations is summarised in the following table.

Assessment Criteria – Consultation with Supervisor

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent</th>
<th>Good</th>
<th>Satisfactory</th>
<th>Unsatisfactory</th>
<th>Poor</th>
<th>nil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of consultation/ per project</td>
<td>• Group clearly demonstrated consistent effort and progress, and discussed points that demonstrated group was considering potential issues as well as options to resolve these issues related to project, and</td>
<td>• Group maintained regular contact with academic supervisor and demonstrated to a reasonable degree of effort and progress of project, and discussed some issues related to project, and demonstrated competence in completing project and was largely self-directed</td>
<td>• Group had intermittent contact with academic supervisor and indicated sporadic progress, and some initiative in resolving issues, but had to be largely guided to complete the project</td>
<td>• Group had infrequent contact with academic supervisor and little evidence to suggest that the project was high on agenda and left until final days before submission, and little initiative demonstrated</td>
<td>• Group had very little contact if any with academic supervisor and little evidence to suggest that large portion of the project was completed during the allocated time evidences that it was left till the last minute, and lack of any initiative demonstrated</td>
<td>• lack of any meaningful consultation by student with academic supervisor</td>
</tr>
</tbody>
</table>

7. STUDYING A UG COURSE IN MINING ENGINEERING AT UNSW

7.1 How We Contact You

At times, the School or your lecturers 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](http://www.it.unsw.edu.au/students/zmail/redirect_external.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: mining@unsw.edu.au
Course inquiries: these should be directed to the course convenor.

7.3 Computing Resources and Internet Access Requirements

UNSW Mining 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.

You can access the School’s computer laboratory in-line with the School laboratory access guidelines and Class bookings.

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)
- 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.

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 Assignment Submissions

The School has developed a guideline to help you when submitting a course assignment. Please take a closer look at all these details on our website: www.engineering.unsw.edu.au/mining-engineering/assignment-submission-policy

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.

7.6 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. Details on deductions that are automatically applied to late submissions are available on our webpage: http://www.engineering.unsw.edu.au/mining-engineering/late-submissions

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

7.7 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 Convener as soon as practicable but no later than five (5) days after release of the course result. If you don’t contact the convener on time, you may be required to re-submit an assignment or re-sit the final exam and may result in you failing the course. You would also have a NC (course not completed) mark on your transcript and would need to re-enroll in the course.
7.8 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

7.9 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: http://www.studentequity.unsw.edu.au/

7.10 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 Mining 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.

7.11 Report Writing Guide for Mining Engineers


7.12 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.