MINE3510

Mine Ventilation

Term 3, 2022

Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Guangyao Si	g.si@unsw.edu.au		OMB 159B	0422645958

School Contact Information

School of Minerals and Energy Resources
Old Main Building, Level 1, 159 (K15)
UNSW SYDNEY NSW 2052 AUSTRALIA

Engineering Student Services
E: mere.teaching@unsw.edu.au
W: www.engineering.unsw.edu.au/minerals-energy-resources

Course Details

Units of Credit 6

Summary of the Course

This course develops the knowledge and skills in metalliferous and coal mine ventilation practice and environmental control. This course includes various aspects of subsurface ventilation engineering such as airflow and ventilation network analysis, fan selection, ventilation air contaminants, subsurface environment, mine hazards, and management plans. You will be equipped with the essential knowledge to design basic ventilation circles, characterise sources of air contaminants, and propose hazard management plans. You will develop the awareness of safety and business risks associated with mining operations and learn approaches to control the risks through effective ventilation strategies.

Course Aims

This course details the attributes, knowledge, and techniques that are required to provide a safe underground working environment through effective ventilation practice

Course Learning Outcomes

After successfully completing this course, you should be able to:

Learning Outcome	EA Stage 1 Competencies
1. Describe and apply the principles of fluid flow and fan behaviour laws to ventilation systems.	PE1.1, PE1.5, PE2.1, PE3.2
2. Design a suitable mine ventilation system for various deposits.	PE1.3, PE2.1, PE3.3
3. Investigate environmental hazards found in mines and outline the ventilation control measures that detect, monitor, minimise and/or manage these hazards.	PE2.2, PE3.2, PE3.6
4. Demonstrate an awareness of the legislative requirements that may apply to the provision of ventilation in a mine.	PE1.6, PE3.4, PE3.5

Teaching Strategies

This course will be delivered mainly through formal lectures, active learning tutorials and practical lab sessions.

Assessment

Who

- ***All assessment items must be submitted to the Course Convenor.*** It must not be submitted directly to the student's individual Project Supervisor – this includes the Project Proposal, Annotated Bibliography and Project Progress Report.

When

- If not otherwise stated, **the default deadline for submission of an assignment is 9am 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.engineering.unsw.edu.au/mining-engineering/what-we-do/about-the-school/school-general-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 Moodle 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 all assignments are listed in Sections 4 and 7 of the *Course Learning Guide*.
- The submission 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.
- Each submission must have appended:
    - to the front, a signed copy of the Student Declaration Form and Coversheet.

How

- The submitted document must be consistent with the following file naming convention: < **FamilyNameInitials_CourseCode_AssignmentNumber.pdf** >.
- A typical complaint filename would take the following form < *SmithPD_MINE4440_A01.pdf* > which elements correspond to:

- Family name of student: Smith
- Initial(s) of student: PD
- Course Code: MINE4440
- Assignment number: A01...as defined in the Course Outline for the assessment task *Project Proposal*
- File format: PDF document

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Mid-Term Quiz	10%	20/10/2022 05:00 PM	1, 2, 3
2. Final Exam	40%	Not Applicable	1, 2, 3, 4
3. Laboratory experiment and Ventsim simulation Report	30%	31/10/2022 09:00 AM	1, 2, 3
4. Tutorials (to be submitted on the day in class)	20%	after each tutorial	1, 2, 3, 4

Assessment 1: Mid-Term Quiz

Start date: 12/09/2022 11:00 AM
Submission notes: on campus quiz- submit in class
Due date: 20/10/2022 05:00 PM

Mid-term quiz to cover topics before Week 6.

Feedback provided via learning management system (LMS)

Assessment 2: Final Exam

Exam to cover the material is the course.

Feedback provided via learning management system (LMS)

Assessment 3: Laboratory experiment and Ventsim simulation Report

Due date: 31/10/2022 09:00 AM

Conduct ventilation network experiment and Ventsim simulation in lab and submit 15-20 page report.

Feedback provided via learning management system (LMS)

Lab work completed in small groups (3-4 students) undertaking multiple tasks to enable completion of assessment. Lab attendance required for assessment completion.

Assessment 4: Tutorials (to be submitted on the day in class)

Due date: after each tutorial

Students need to complete 4 tutorials and submit them on the day in class. Each one of the tutorial is weighted 5%.

Feedback provided via learning management system (LMS)

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

Course Schedule

View class timetable

Timetable

Date	Type	Content
O-Week: 5 September - 9 September		
Week 1: 12 September - 16 September	Lecture	14 Sep: Course introduction/Airflow 15 Sep: Fan/Fan lows
Week 2: 19 September - 23 September	Lecture	21 Sep: Tutorial 1- Airflow and Fan 22 Sep: Ventilation Services and Network Analysis
Week 3: 26 September - 30 September	Tut-Lab	28 Sep: Tutorial 2- Network 29 Sep: Laboratory - Duct Resistance/Fan Characteristics (On campus)
Week 4: 3 October - 7 October	Lecture	5 Oct: Mine Gases 6 Oct: Gas Monitoring
Week 5: 10 October - 14 October	Tutorial	Flexible week: Review mid-term quiz
Week 6: 17 October - 21 October	Tutorial	19 Oct: Ventsim Training (On campus) 20 Oct: Tutorial 3- Gas / Mid-Term quiz
	Assessment	Mid-Term Quiz: on campus quiz- submit in class
Week 7: 24 October - 28 October	Lecture	26 Oct: DPM/Dust 27 Oct: Tutorial 4- DPM/Dust
Week 8: 31 October - 4 November	Tutorial	2 Nov: Heat and Psychometric 3 Nov: Refrigeration/Tutorial 5
	Assessment	Laboratory experiment and Ventsim simulation

		Report
Week 9: 7 November - 11 November	Lecture	9 Nov: Spontaneous Combustion 10 Nov: Gas Reservoir Characteristics, Gas Drainage
Week 10: 14 November - 18 November	Lecture	16 Nov: Coal Mine Ventilation Practice 17 Nov: Metal Mine Ventilation Practice

Resources

Prescribed Resources

Lecture notes, presentations, and reading material.

Recommended Resources

- Le Roux's Notes on Environmental Engineering.
- Subsurface Ventilation and Environmental Engineering, Malcolm J. McPherson, 1993

Course Evaluation and Development

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.

Feedback is given via https://student.unsw.edu.au/myexperience and you will be notified when this is available for you to complete.

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.

Submission of Assessment Tasks

The School has developed a guideline to help you when submitting a course assignment.

We encourage you to retain a copy of every assignment submitted for assessment for your own record either in hardcopy or electronic form.

All assessments must have an assessment cover sheet attached.

Course completion

Course completion requires submission of all assessment items. Failure to submit all assessment items may result in the award of an Unsatisfactory Failure (UF) grade for the Course unless special consideration has been submitted and approved.

Late Submission of an Assignment

Full marks for an assessment are only possible when an assessment is received by the due date. Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of five percent (5%) of the maximum mark possible for that assessment item. The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day. This is for all assessments where a penalty applies.

Work submitted after five days (120 hours) will not be accepted and a mark of zero will be awarded for that assessment item.

For some assessment items, a late penalty may not be appropriate. These will be indicated in the course outline, and such assessments will receive a mark of zero if not completed by the specified date. Examples include:

- Weekly online tests or laboratory work worth a small proportion of the subject mark, or
- Online quizzes where answers are released to students on completion, or Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date, or Pass/Fail assessment tasks.

We understand that at times you may not be able to submit an assignment on time, and the School will accommodate any fair and reasonable extension. We would recommend you review the UNSW Special Consideration guidelines – see section below.

Special Consideration

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

- Prevent you from completing a course requirement
- Keep you from attending an assessable activity
- Stop you submitting assessable work for a course
- Significantly affect your performance in assessable work, be it a formal end-of-semester

examination, a class test, a laboratory test, a seminar presentation or any other form of assessment

We ask that you please contact the Course Convenor immediately once you have completed the special consideration application, no later than one week from submission.

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

Student Support

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

- Library training and support services - www.library.unsw.edu.au
- UNSW Learning Centre - www.lc.unsw.edu.au
- Counselling support - www.counselling.unsw.edu.au

Equitable Learning Services aims to provide all students with a free and confidential service that provides practical support to ensure that your health condition doesn't adversely affect your studies. https://student.unsw.edu.au/els

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 www.student.unsw.edu.au/plagiarism.

All MERE 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: 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.

Academic Information

Course Results

For details on UNSW assessment policy, please visit: www.student.unsw.edu.au/assessment

In some instances your final course result may be withheld and not released on the UNSW planned date. This is indicated by a course grade result of either:

- LE – indicates you have not completed one or more items of assessment; or
- WD – indicates 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.

Studying a course in the School of Minerals and Energy Resources Engineering at UNSW

Report writing guide

The School has a Report Writing Guide (RWG) available. A copy of this is available on the course Moodle site.

Computing Resources and Internet Access Requirements

UNSW Minerals and Energy Resources Engineering provides blended learning using the on-line Moodle LMS (Learning Management System). Also see - Transitioning to Online Learning: www.covid19studyonline.unsw.edu.au

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.

- Mining Engineering Students: OMB G48
- Petroleum Engineering Students: TETB LG34 & LG 35

It is recommended that you have regular internet access to participate in forum discussion and group work. To run Moodle most effectively, you should have:

- broadband connection (256 kbit/sec or faster)
- ability to view streaming video (high or low definition UNSW TV options)

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

Accessing Course Materials Through Moodle

Course outlines, support materials are uploaded to Moodle, the university standard Learning Management System (**LMS**). In addition, on-line assignment submissions are made using the assignment dropbox facility provided in Moodle. All enrolled students are automatically included in Moodle for each course. To access these documents and other course resources, please visit: www.moodle.telt.unsw.edu.au

This course outline sets out description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle should be consulted for the up to date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline (as updated in Moodle), the description in the Course Outline/Moodle applies.

How We Contact You

At times, the School or your course convenors may need to contact you about your course or your enrolment. Your course convenors will use the email function within Moodle or we will contact you on your @student.unsw.edu.au email address.

We understand that you may have an existing email account and would prefer for your UNSW emails to be redirected to your preferred account. Please see instructions on how to redirect your UNSW emails: "How can I forward my emails to another account?"

How You Can Contact Us

We are always ready to assist you with your inquiries. To ensure your question is directed to the correct person, please use the email address below for:

- Enrolment or other admin questions regarding your program: https://unswinsight.microsoftcrmportals.com/web-forms/
- Course inquiries should be directed to the Course Convenor

Image Credit

Synergies in Sound 2016

CRICOS

CRICOS Provider Code: 00098G

Acknowledgement of Country

We acknowledge the Bedegal people who are the traditional custodians of the lands on which UNSW Kensington campus is located.

Appendix: Engineers Australia (EA) Professional Engineer Competency Standard

Program Intended Learning Outcomes	
Knowledge and skill base	
PE1.1 Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline	✓
PE1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline	
PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline	✓
PE1.4 Discernment of knowledge development and research directions within the engineering discipline	
PE1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline	✓
PE1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline	✓
Engineering application ability	
PE2.1 Application of established engineering methods to complex engineering problem solving	✓
PE2.2 Fluent application of engineering techniques, tools and resources	✓
PE2.3 Application of systematic engineering synthesis and design processes	
PE2.4 Application of systematic approaches to the conduct and management of engineering projects	
Professional and personal attributes	
PE3.1 Ethical conduct and professional accountability	
PE3.2 Effective oral and written communication in professional and lay domains	✓
PE3.3 Creative, innovative and pro-active demeanour	✓
PE3.4 Professional use and management of information	✓
PE3.5 Orderly management of self, and professional conduct	✓
PE3.6 Effective team membership and team leadership	✓