UNSW Course Outline

MINE3510 Mine Ventilation - 2024

Published on the 10 Sep 2024

General Course Information

Course Code : MINE3510
Year : 2024
Term : Term 3
Teaching Period : T3
Is a multi-term course? : No
Faculty : Faculty of Engineering
Academic Unit : School of Minerals & Energy Resources Engineering
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

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. This course improve students safety awareness and ventilation knowledge in Mining Engineering

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Describe and apply the principles of fluid flow and fan behaviour laws to ventilation systems.
CLO2 : Design a suitable mine ventilation system for various deposits.
CLO3 : Investigate environmental hazards found in mines and outline the ventilation control measures that detect, monitor, minimise and/or manage these hazards.
CLO4 : Demonstrate an awareness of the legislative requirements that may apply to the provision of ventilation in a mine.

Course Learning Outcomes	Assessment Item
CLO1 : Describe and apply the principles of fluid flow and fan behaviour laws to ventilation systems.	• Tutorials (to be submitted on the day in class) • Laboratory experiment and Ventsim simulation Report • Mid-Term Quiz • Final Exam
CLO2 : Design a suitable mine ventilation system for various deposits.	• Tutorials (to be submitted on the day in class) • Laboratory experiment and Ventsim simulation Report • Mid-Term Quiz • Final Exam
CLO3 : Investigate environmental hazards found in mines and outline the ventilation control measures that detect, monitor, minimise and/or manage these hazards.	• Tutorials (to be submitted on the day in class) • Laboratory experiment and Ventsim simulation Report • Mid-Term Quiz • Final Exam
CLO4 : Demonstrate an awareness of the legislative requirements that may apply to the provision of ventilation in a mine.	• Tutorials (to be submitted on the day in class) • Final Exam

Learning and Teaching Technologies

Moodle - Learning Management System

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Tutorials (to be submitted on the day in class) Assessment Format: Individual	20%	
Laboratory experiment and Ventsim simulation Report Assessment Format: Individual	30%	
Mid-Term Quiz Assessment Format: Individual	10%	
Final Exam Assessment Format: Individual	40%	

Assessment Details

Tutorials (to be submitted on the day in class)

Assessment Overview

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

Work will be marked against assessment criteria. Individual written feedback will be provided online and verbal class-wide feedback during the tutorials.

Course Learning Outcomes

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- CLO4 : Demonstrate an awareness of the legislative requirements that may apply to the provision of ventilation in a mine.

Generative AI Permission Level

Simple Editing Assistance

In completing this assessment, you are permitted to use standard editing and referencing functions in the software you use to complete your assessment. These functions are described below. You must not use any functions that generate or paraphrase passages of text or other media, whether based on your own work or not.
If your Convenor has concerns that your submission contains passages of AI-generated text or

media, you may be asked to account for your work. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.
For more information on Generative AI and permitted use please see here.

Laboratory experiment and Ventsim simulation Report

Assessment Overview

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

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

Work will be marked against assessment criteria. Individual written feedback will be provided online and verbal class-wide feedback during the tutorials.

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- CLO2 : Design a suitable mine ventilation system for various deposits.
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Mid-Term Quiz

Assessment Overview

Mid-term quiz to cover topics before Week 6.

Work will be marked against assessment criteria. Individual written feedback will be provided online and verbal class-wide feedback during the tutorials.

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- CLO2 : Design a suitable mine ventilation system for various deposits.
- CLO3 : Investigate environmental hazards found in mines and outline the ventilation control measures that detect, monitor, minimise and/or manage these hazards.

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Final Exam

Assessment Overview

Exam to cover the material is the course.

Work will be marked against assessment criteria.

Course Learning Outcomes

- CLO1 : Describe and apply the principles of fluid flow and fan behaviour laws to ventilation systems.
- CLO2 : Design a suitable mine ventilation system for various deposits.
- CLO3 : Investigate environmental hazards found in mines and outline the ventilation control measures that detect, monitor, minimise and/or manage these hazards.

- CLO4 : Demonstrate an awareness of the legislative requirements that may apply to the provision of ventilation in a mine.

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General Assessment Information

Further information about course assessments will be provided on Moodle.

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 0 : 2 September - 8 September	Reading	
Week 1 : 9 September - 15 September	Lecture	Lecture 1: Course introduction/Airflow Lecture 2: Fan/Fan lows
Week 2 : 16 September - 22 September	Lecture	Workshop 1- Airflow and Fan Lecture 3 Ventilation Services and Network Analysis
Week 3 : 23 September - 29 September	Lecture	Workshop 2- Network Laboratory - Duct Resistance/Fan Characteristics (On campus)
Week 4 : 30 September - 6 October	Lecture	Lecture 4: Mine Gases Lecture 5: Gas Monitoring
Week 5 : 7 October - 13 October	Lecture	Lecture: Ventsim Training (On campus) Workshop 3- Gas / Mid-Term quiz
Week 6 : 14 October - 20 October	Reading	
Week 7 : 21 October - 27 October	Lecture	Lecture: DPM/Dust Workshop 4- DPM/Dust
Week 8 : 28 October - 3 November	Lecture	Lecture: Heat and Psychometric Workshop: heat calculation
Week 9 : 4 November - 10 November	Lecture	Lecture: Spontaneous Combustion Lecture: Gas Reservoir Characteristics, Gas Drainage
Week 10 : 11 November - 17 November	Lecture	Lecture: Coal Mine Ventilation Practice Lecture: Metal Mine Ventilation Practice

Attendance Requirements

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

Course Resources

Prescribed Resources

Please refer to course convenor and Moodle for more information.

Recommended Resources

Please refer to course convenor and Moodle for more information.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
	Guangyao Si					No	Yes

Other Useful Information

Academic Information

I. Special consideration and supplementary assessment

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to, or within 3 working days of, submitting an assessment or sitting an exam.

Please note that UNSW has a Fit to Sit rule, which means that if you sit an exam, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the information on UNSW's Special Consideration page.

II. Administrative matters and links

All students are expected to read and be familiar with UNSW guidelines and polices. In particular, students should be familiar with the following:

- Attendance
- UNSW Email Address
- Special Consideration
- Exams
- Approved Calculators
- Academic Honesty and Plagiarism
- Equitable Learning Services

III. 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 convener prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equitable Learning Services. 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.

IV. Professional Outcomes and Program Design

Students are able to review the relevant professional outcomes and program designs for their streams by going to the following link: https://www.unsw.edu.au/engineering/student-life/student-resources/program-design.

Note: This course outline sets out the 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 or your primary learning management system (LMS) 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/Moodle/LMS, the description in the Course Outline/Moodle/LMS applies.

Academic Honesty and Plagarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off 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. UNSW has produced a website

with a wealth of resources to support students to understand and avoid plagiarism, visit: student.unsw.edu.au/plagiarism. The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also 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 tasks.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis or contract cheating) even suspension from the university. The Student Misconduct Procedures are available here:

www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Submission of Assessment Tasks

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, per calendar day.

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 clearly 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;
- Exams, peer feedback and team evaluation surveys;
- Online quizzes where answers are released to students on completion;
- Professional assessment tasks, where the intention is to create an authentic assessment that

has an absolute submission date; and,
- Pass/Fail assessment tasks.

Faculty-specific Information

Engineering Student Support Services – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

Engineering Industrial Training – Industrial training questions

UNSW Study Abroad – study abroad student enquiries (for inbound students)

UNSW Exchange – student exchange enquiries (for inbound students)

UNSW Future Students – potential student enquiries e.g. admissions, fees, programs, credit transfer

Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

School-specific Information

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.

Submission of Assessment Tasks

We encourage you to retain a copy of every assignment submitted for your own record, either in hardcopy or electronic form. All assessments must have an assessment cover sheet attached (if required).

Student Resources

The School has student resources section, containing useful advice and information to ensure you're able to focus on your studies.

Computing Resources and Internet Access Requirements

UNSW Minerals and Energy Resources Engineering provides blended learning using the online Moodle LMS (Learning Management System). Also see - Transitioning to Online Learning: https://www.student.unsw.edu.au/transitioning-online-learning

Note that some specialist engineering software is not available for Mac computers.

- Mining Engineering Students: OMB G48
- Petroleum Engineering Students: TETB LG34 & LG35

For 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

School Contact Information

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

For current students, all enquiries and assistance relating to enrolment, class registration, progression checks and other administrative matters, please see The Nucleus: Student Hub.

Web & Important Links:

School of Minerals and Energy Resources
The Nucleus Student Hub
Moodle
UNSW Handbook

UNSW Timetable

Student Wellbeing

Urgent Mental Health & Support

Equitable Learning Services