



Department of
MINING ENGINEERING
THE UNIVERSITY OF UTAH

MGEN 6350: Mining Health and Safety Hazards and Controls (3 credits)

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Office Hours: By appointment

Zoom/IM/Canvas Conference Office Hours: By appointment

Course Description

Mining Health and Safety Hazards and Controls is a graduate-level course designed to provide students with a comprehensive understanding of the health and safety hazards associated with mining operations, as well as the strategies and controls employed to mitigate these risks. The course covers a wide range of topics, including hazard identification, risk assessment, safety regulations, occupational health, emergency response planning, and safety management systems. Through case studies, discussions, and practical exercises, students will develop the skills and knowledge necessary to assess, manage, and control health and safety risks in mining environments.

Course Outcomes

1. To develop an in-depth understanding of health and safety hazards specific to mining operations.
2. To familiarize students with risk assessment methodologies and hazard identification techniques in mining.
3. To provide students with knowledge of relevant safety regulations and standards in the mining industry.
4. To equip students with the skills to develop and implement effective health and safety management systems in mining environments.
5. To enhance students' abilities to evaluate and apply controls and mitigation strategies for mining-related hazards.
6. To encourage critical thinking and problem-solving skills through case studies and practical exercises.

Assignments

[You can provide entire summary/details of assignments here or provide brief overview and elaborate in class, on handouts, or in Canvas.]

Assignment Title [Repeat as necessary for each assignment.]

Description, details, due dates, etc.

Grading Policy

Students will be evaluated through assignments, quizzes, exams and class project. Student professionalism demonstrated through attendance and respect for others will also be reflected in evaluation. Grading will follow the following scheme:

Homework 20%
Term project 10%
Reading quizzes 20%
Mid-term exam 20%
Final exam 20%
Professionalism 10%

Subject to change per instructor's discretion. Grading will follow the University of Utah grading scale of:

0%- 59.5%	60% - 64.5%	65%- 69.5%	70% - 74.5%	75%- 79.5%	80%- 84.5%	85%- 89.5%	90%- 94.5%	95%- 100
E	D-	D+	C-	C+	B-	B+	A-	A

Course Schedule

Week 1: Introduction to Mining Health and Safety

- Course overview and objectives
- Key concepts in mining health and safety
- Regulatory framework and industry standards

Week 2: Hazard Identification and Risk Assessment

- Principles of hazard identification and risk assessment
- Common hazards in mining operations
- Quantitative and qualitative risk assessment methodologies

Week 3: Occupational Health in Mining

- Occupational diseases and exposure hazards
- Monitoring and control of hazardous substances
- Ergonomics and workplace design considerations

Week 4: Safety Management Systems in Mining

- Introduction to safety management systems (SMS)
- Elements of an effective SMS
- Implementing and auditing safety management systems

Week 5: Mine Ventilation and Air Quality

- Ventilation system design and operation
- Monitoring and control of airborne contaminants

- Respiratory protection and personal protective equipment (PPE)

Week 6: Ground Control and Rock Mechanics

- Rock mass behavior and stability analysis
- Ground control techniques and support systems
- Monitoring and management of ground hazards

Week 7: Fire and Explosion Hazards

- Principles of fire and explosion hazards in mining
- Fire prevention and suppression strategies
- Emergency response planning for fire and explosion incidents

Week 8: Electrical Safety in Mining

- Electrical hazards and safety regulations
- Design and maintenance of electrical systems
- Grounding and bonding techniques

Week 9: Machinery and Equipment Safety

- Hazards associated with mining machinery and equipment
- Safety considerations in equipment design and operation
- Maintenance and inspection practices

Week 10: Emergency Response and Mine Rescue

- Emergency response planning and procedures
- Mine rescue operations and training
- Lessons learned from real-life mining emergencies

Week 11: Human Factors and Behavioral Safety

- Human error and its impact on safety performance
- Safety culture and leadership in mining organizations
- Behavioral safety programs and interventions

Week 12: Safety Communication and Training

- Effective safety communication strategies
- Training programs and methods in mining
- Evaluating the effectiveness of safety training

Week 13: Case Studies in Mining Safety

- Analysis of real-life mining accidents and incidents
- Lessons learned and preventive measures
- Group discussions and presentations

Week 14: Emerging Trends in Mining Safety

- Exploration of emerging technologies and practices in mining safety

- Robotics and automation in hazard detection and mitigation
- Sustainable safety practices in

Finals Week:

Note: This syllabus is meant to serve as an outline and guide for our course. Please note that I may modify it with reasonable notice to you. I may also modify the Course Schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas under Announcements.

University Policies

1. ***The Americans with Disabilities Act.*** The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability & Access, 162 Olpin Union Building, (801) 581-5020. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability & Access.
 - ***If in-class attendance is a necessary component of the course for pedagogical reasons (e.g., laboratories, studios, or artistic training), state it explicitly.***

Use this standard language: “Given the nature of this course, attendance is required and adjustments cannot be granted to allow non-attendance. However, if you need to seek an ADA accommodation to request an exception to this attendance policy due to a disability, please contact the Center for Disability and Access (CDA). CDA will work with us to determine what, if any, ADA accommodations are reasonable and appropriate

2. ***University Safety Statement.*** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit <https://safeu.utah.edu>
3. ***Addressing Sexual Misconduct.*** Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran’s status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the

Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

4. ***Academic Misconduct Statement.*** It is expected that students adhere to University of Utah policies regarding academic honesty, including but not limited to refraining from cheating, plagiarizing, misrepresenting one's work, and/or inappropriately collaborating. This includes the use of generative artificial intelligence (AI) tools without citation, documentation, or authorization. Students are expected to adhere to the prescribed professional and ethical standards of the profession/discipline for which they are preparing. Any student who engages in academic dishonesty or who violates the professional and ethical standards for their profession/discipline may be subject to academic sanctions as per the University of Utah's Student Code: <https://regulations.utah.edu/academics/6-410.php>