Department of
MINING ENGINEERING
THE UNIVERSITY OF UTAH

MGEN 6390: Mining Emergency Management & Emerging Technologies (1 credit)

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Zoom/IM/Canvas Conference Office Hours: By appointment

Course Description
Mining Emergency Management & Emerging Technologies is a graduate-level course designed to provide students with an understanding of emergency management strategies and the application of emerging technologies in the mining industry. The course focuses on the prevention, preparedness, response, and recovery aspects of mining emergencies, as well as the integration of innovative technologies for effective emergency management. Through theoretical instruction, case studies, and hands-on activities, students will develop the knowledge and skills necessary to assess risks, develop emergency response plans, and leverage emerging technologies to enhance safety and efficiency in mining operations.

Course Outcomes
1. To comprehend the fundamentals of mining emergency management and the importance of preparedness in the mining industry.
2. To analyze the risks associated with mining operations and develop strategies for mitigating and preventing emergencies.
3. To familiarize students with emergency response planning, incident command systems, and crisis communication in mining emergencies.
4. To explore emerging technologies and their applications in mining emergency management.
5. To enhance students' abilities to assess, select, and implement emerging technologies to improve emergency response and recovery.
6. To encourage critical thinking and problem-solving skills through case studies and hands-on activities.

Grading Policy
Students will be evaluated trough 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 Emergency Management
- Course overview and objectives
- Importance of emergency management in mining operations
- Regulatory requirements and industry standards

Week 2: Risk Assessment and Hazard Identification
- Principles of risk assessment and hazard identification in mining
- Evaluation of potential hazards and their impacts
- Risk management strategies and prevention measures

Week 3: Emergency Response Planning and Preparedness
- Development of emergency response plans for mining operations
- Incident command systems and roles
- Training and exercises for emergency preparedness

Week 4: Crisis Communication and Public Relations
- Effective communication strategies in mining emergencies
- Crisis communication plans and protocols
- Managing media relations and stakeholder communications

Week 5: Emergency Simulation and Response Exercises
- Conducting emergency response exercises
- Evaluating and improving emergency response performance
- Lessons learned from past mining emergencies

Week 6: Incident Investigation and Lessons Learned
- Incident investigation methodologies and techniques
- Analyzing root causes and contributing factors
- Implementing corrective actions and preventive measures

Week 7: Emergency Equipment and Resources Management
- Inventory and maintenance of emergency equipment

- Resource allocation and management during emergencies
- Collaboration with external emergency response agencies

Week 8: Mine Rescue Operations and Procedures
- Mine rescue team organization and training
- Mine rescue equipment and techniques
- Coordination with emergency services for mine rescue

Week 9: Emerging Technologies in Mining Emergency Management
- Overview of emerging technologies in the mining industry
- Applications of drones, IoT, and AI in emergency management
- Remote monitoring and communication systems

Week 10: Real-Time Monitoring and Early Warning Systems
- Real-time monitoring technologies for hazard detection
- Early warning systems for slope stability, gas leaks, etc.
- Integration of monitoring systems with emergency response

Week 11: Data Analytics for Emergency Decision-Making
- Utilizing data analytics for situational awareness
- Predictive modeling and risk forecasting
- Decision support systems for emergency management

Week 12: Mobile Applications and Wearable Technology
- Mobile applications for emergency communication and reporting
- Wearable technology for personal safety monitoring
- Integration of mobile and wearable devices in emergency response

Week 13: Case Studies in Mining Emergency Management
- Analysis of real-life mining emergencies and response strategies
- Lessons learned and best practices
- Group discussions and presentations

Week 14: Remote Sensing and Mapping Technologies
- Remote sensing applications for emergency management
- Mapping technologies for incident response and recovery
- Integration of GIS and remote sensing in emergency planning

Week 15: Future Trends in Mining Emergency Management
- Exploration of emerging technologies and their potential impact on mining emergency management
- Discussion of future challenges and opportunities

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