14/07/2026

Ingeniería de Minas
FACULTAD DE CIENCIAS FÍSICAS Y MATEMÁTICAS
UNIVERSIDAD DE CHILE

BROCHURE

Presents

CED

INTERNATIONAL Caving–Engineering DIPLOMA

Building expertise in cave mining through industry-focused education

[*Since 2008*]

www.cavingdiploma.cl

https://www.linkedin.com/company/ced-uchile/

The University of Chile presents the Caving-Engineering Diploma 2026-2027: a specialized program designed to provide the technical knowledge essential for the effective implementation of caving-based mining methods in line with current industry demands. Due to the deepening of mining activities around the world and the need for low-cost, highly productive mining methods, cave mining is profiled as the most viable mining method for the future. Because of the high complexity involved in this method, specialized professionals with technical competencies in several areas, such as preconditioning, mine design, mine planning, mine ventilation, and automation are required and are those the CED seeks to develop. Through a variety of academic activities, the CED will lead students to explore and manage the complexities of this mining method.

PROGRAM OBJECTIVES

Cave mining, as a highly complex mining method, requires specialized professionals with technical competencies in several areas, such as preconditioning, mine design, mine planning, mine ventilation, and automation. The CED aims to train these competencies through academic activities such as lectures, technical presentations, personal study and other activities.

At the end of the program, participants will be able to do the following:

- Differentiate the latest techniques in geological and geotechnical characterization and understand the role of preconditioning techniques in the rock mass for caving methods.
- Identify and quantify the main geomechanical hazards in caving methods and have the skills to efficiently model, mitigate and manage them.
- Distinguish and implement the primary methodologies, techniques and tools for planning a caving operation.
- Identify the main environmental aspects in caving methods and their impacts and design mitigation plans according to the legislation.
- Understand and implement the geomechanical fundamentals used in block cave mining.
- Design the levels of production, undercutting, ventilation, and material handling.
- Design a ventilation system for caving methods.
- Identify and propose alternatives for technical/economic challenges with possible risks to the execution of a cave project.

TARGET GROUP

The target audience for this program includes professionals in the mining industry such as Mining Engineers, Industrial Engineers, Civil Engineers, and Geologists as well as professionals from other disciplines related to the cave mining industry.

PROGRAM DEDICATION TIME

The program is structured to combine direct teaching, personal study, applied activities, field-based learning, and final project development, providing participants with a comprehensive 220-hour learning experience in cave mining.

INDUSTRY AND ACADEMIC COMMITTEE

The Industry and Academic Committee brings together recognized experts from academia and the mining industry to support the technical quality, relevance, and practical orientation of the CED. Through academic guidance and industry review, the committee helps ensure that the program remains aligned with the current and future challenges of cave mining.

ACADEMIC ADVISORY BOARD	INDUSTRY ADVISORY BOARD
Role: Propose academic program & lectures	Role: Review academic program & lectures
Fidel Báez Senior Advisor Block Caving, University of Chile	**César Pardo** Corporate Geoscience Manager, CODELCO
Raúl Castro Associate Professor, University of Chile	**Rigoberto Rimmelin** Global Practice Lead Geotechnical, Resource Center of Excellence, BHP
Scott Dunbar Head of Department of Mining Engineering, University of British Columbia (UBC)	**Ian Edgar** General Manager, Geoscience & Resource Engineering, Freeport
Allan Moss President, Sonal Mining Technology Inc., University of British Columbia (UBC)	**Sarah Webster** Principal Caving Specialist Evolution Mining

COURSES

The CED technical program is organized into a sequence of courses and specialized modules covering the main disciplines involved in cave mining, from geotechnical characterization and geomechanics to mine design, seismicity, ground support, preconditioning, automation, drilling and blasting, mine planning, ventilation, project analysis, and final project development.

Each module is led by lecturers with specialized expertise, allowing participants to build a structured understanding of cave mining methods, technical risks, operational challenges, and practical applications.

COURSE	SUB C.	TOPICS	LECTURERS	DATE	HOURS LECTURE	TOTAL HOURS
1	1	Introduction to Block Caving	F. Báez Allan Moss	13, 14, 15 October	6	6
2	2	Geotechnical Characterization	A. Brzovick	10, 11, 12 November	6	6
3	3.1	Geomechanical Fundamentals	E. Eberhardt	8 & 9 December	4	12
	3.2	Block Caving Geomechanics Risk	D. Cuello	10 & 15 December	4	
	3.3	Numerical Modelling in Caving Mechanics	M. Fuenzalida	16 & 17 December	4	
4	4.1	Mine Seismicity, Seismic Risk, and Instrumentation Systems	D. Malovichko	12, 13, 14 January	6	8
	4.2	Seismicity and Case Studies	S. Gaete	19 January	2	
5	5.1	Fundamental Dynamic Support and Ground Support Design	J. Vallejos	9 & 10 March	4	10
	5.2	Preconditioning of the Rock Mass	R. Rimmelin	11 & 16 March	4	
	5.3	Preconditioning of the Rock Mass and Case Studies	A. Catalan	17 March	2	
	6.1	Cave Mining Design	R. Castro	13, 14, 15 & 20, 21 April	10	

6	6.2	Automation	J. Ruiz del Solar	22 April	2	12
7	7.1	Cave Drill & Blast Fundamentals	J.P. Henríquez	18 & 19 May	4	8
	7.2	Development and Production Blasting in Cave Mines	D. Morales	20 & 25 May	4	
8	8.1	Ventilation Fundamentals: Ventilation in Deep Mining Operations	D. Stinnette	15 & 16 June	4	6
	8.2	Case Studies		17 June	2	
9	9.1	Block Caving Planning Fundamentals	A. Ovalle	13, 14, 15 July	6	14
	9.2	Mine Planning and Operational Safety Planning Tools	R. Castro	20 July	2	
			D. Villa	21 July	2	
	9.3	Mine Planning Case Studies	D. Villa	22 July	2	
	9.4	Mine Planning Safety	I. Edgar	27 July	2	
10	10.1	Caving Project Analysis	A. Moss	17, 18, 19 August	6	8
	10.2		A. Catalan	24 August	2	
11	11.1	Final Project Presentation	F. Báez R. Castro	8 September	4	4
	11.2	CODELCO Mine Visit (Chuquicamata - El Teniente)	F. Báez R. Castro	6 – 10 September	40	40

PROGRAM LECTURER MEMBERS

The CED faculty brings together lecturers and specialists from universities, mining companies, consulting firms, technology providers, and research organizations to combine academic knowledge with applied industry experience.

The CED faculty's diverse areas of expertise allow participants to approach cave mining from multiple technical perspectives, including geotechnical characterization, geomechanics, mine design, seismicity, rock blasting, automation, ventilation, mine planning, and project implementation.

Lecturer	Professional / Academic Degree	Specialty	Institution / Company
Fidel Báez	Mining Engineer MSc Mining Economics	Mine Design, Mine Management	Senior Lecturer University of Chile
Andrés Brzovic	Geologist PhD in Rock Mechanics	Geology, Geotechnics, Geomechanics	Manager of Geosciences CMP
Raúl Castro	Mining Engineer PhD Mining Engineering	Mine Design, Gravity Flow, Mine Planning	Associate Professor University of Chile
Erik Eberhardt	Geological Engineer MSc and PhD in Rock Mechanics	Rock Mechanics, Geological Engineering Geotechnical Engineering	Associate Professor University of British Columbia
Rigoberto Rimmelin	Mining Engineer MSc in Geotechnical Engineering	Geotechnical Engineering Geotechnical Risk	Global Practice Lead Geotechnical BHP
David Cuello	Mining Engineer MSc in Mining Geomechanics	Geomechanics Geotechnical Design	Senior Technical Director GMT
Miguel Fuenzalida	Mining Engineer MSc in Mining	Geomechanics Advanced Numerical Modelling	Principal Geomechanics Itasca Consulting Group
Javier Vallejos	Civil Engineer MSc in Geotechnical Engineering PhD in Mining Engineering	Geomechanics Geotechnical Design	Associate Professor University of Chile

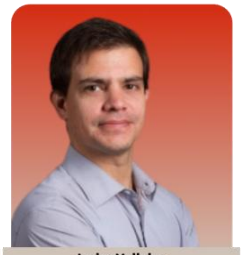
Alex Catalán	Mining Engineer PhD Mining and Rock Mechanics	Geotechnical Engineering Rock-Mass Preconditioning	Independent Consultant
Dmitriy Malovichko	Geological Engineer MSc. Geology PhD in Physics and Mathematical Science	Mine Seismicity Seismic Hazard	Head of Applied Seismology Institute of Mine Seismology, SA
Sergio Gaete	Mathematical Engineer	Mine Seismicity	Independent Consultant
Juan Pablo Henríquez	Mining Engineer	Rock Blasting Drill and Blast	Engineering Manager Enaex Chile
Danko Morales	Mining Engineer MSc in Mining	Rock Blasting Drill and Blast	Underground Mining Manager Enaex Chile
Daniel Stinnette	Mining Engineer MSc in Mining Engineering	Mine ventilation Ventilation Modelling Underground Ventilation Systems	President Ventilation Innovation
Alfonso Ovalle	Mining Engineer	Mine Planning	Adjunct Professor University of Chile
Daniel Villa	Mining Engineer MSc in Mining Engineering	Mine Planning	Senior Principal Mining Engineer WSP
Ian Edgar	Mining Engineer	Mine Planning Safety	Vice President Underground Planning Freeport-McMoRan
Allan Moss	Geological Engineer	Cave Mining Projects Cave Design	Adjunct Professor University of British Columbia
Javier Ruiz del Solar	Electrical Engineer MSc in Electrical Engineering PhD in Electrical Engineering	Automation	Professor Advanced Mining Technology Center

Andrés Brzovic
Senior Geotechnical Engineer
Independent Consultant
Canada

Erik Eberhardt
Geological Engineering
University of British Columbia
Canada

David Cuello
Senior Technical Director
GMT
Australia

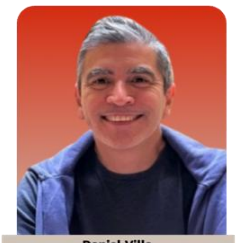
Miguel Fuenzalida
Principal Geomechanics
Itasca
United States



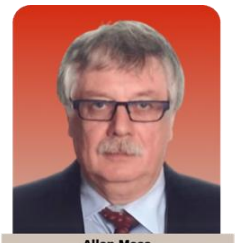
Javier Vallejos
Professor/Geomechanics
Universidad de Chile
Chile

Rigoberto Rimmelin
Global Practice Lead Geotechnical
BHP
Australia

Fidel Báez
Senior Consultant
Independent
Chile



Daniel Villa
Senior Principal Mining Engineer
Dassault System
Canada



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Ventilation Innovation
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Juan Pablo Henríquez
Engineering Manager UG
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Chile

Sergio Gaete
Seismicity
Capstone Copper
Chile

Javier Ruíz del Solar
Automation
AMTC
University of Chile

Dmitriy Malovichko
Director and Head of Applied
Institute of Mine Seismology
Australia

COURSES

Each course is presented with detailed information on its topics, dates, lecturers, learning objectives, and scheduled sessions, allowing participants to understand the scope, structure, and technical focus of each module. This format provides a clear overview of how the program is organized and how each course contributes to the development of specialized knowledge in cave mining.

COURSE 1
INTRODUCTION TO CAVE MINING

CONTENTS

Day 1 (Allan Moss - 13 October)

- Why caving is important
- Block caving basics
- Block caving terminology
- Challenges of cave mining

Day 2 (Fidel Báez - 14 October)

- Variants and classification of the cave mining method
- Overview of cave development and initial operations
- History, development, future and challenges of cave mining

Day 3 (Fidel Báez - 15 October)

- Evolution of equipment
- Caving mine challenges

Goals

- Understand the concepts, history, and main challenges of the cave mining methods
- Understand the main variables to be considered in the design of cave mining
- Understand and apply the critical variables and design parameters for Block and Panel Caving
- Undertake a critical analysis of different methods and techniques used in cave mining through case studies.

COURSE 2
GEOTECHNICAL CHARACTERIZATION

CONTENTS

Day 4 (Andrés Brzovic - 10 November)

- Introduction: Challenges of caving and rock mass characterization (RMC)
- Intact rock & vein strength characterization
- Rock fabric or structure characterization

Day 5 (Andrés Brzovic - 11 November)

- Classification and description of discontinuities (RMR)
- Analysis and representation of discontinuities
- Emerging technologies in geotechnical characterization
- Some technological advantages for RMC study cases

Day 6 (Andrés Brzovic - 12 November)

- Mechanical properties of intact rock and rock mass
- Rock mass classification systems & rock mass character
- Rock mass classification (GSI/Q)
- Applied innovation in geotechnical engineering

Goals

- Understand and apply the necessary concepts in geotechnical characterization for porphyry copper-gold ore deposits
- Understand the role of discontinuities in block caving
- Grasp the latest techniques & approaches in geological and geotechnical characterization for caving

COURSE 3.1
GEOMECHANICAL FUNDAMENTALS

CONTENTS

Day 7 (Erick Eberhardt - 8 December)

- Definition of stress and strain
- In-situ stresses
- In-situ stress measurement
- Stress analysis
- Stress, strain and yielding analysis

Day 8 (Erick Eberhardt - 9 December)

- Importance of failure mode/mechanisms
- Wedge & empirical analysis
- Squeezing & ground response curves
- New tools for brittle failure
- Deformation-based support design & preventative support maintenance
- Case studies

Goals

- Understand stress and strain behavior in rock masses and the origin, orientation, and variability of in situ stresses, with emphasis on their role in cave mining
- Evaluate stress indicators, measurement techniques, and stress analysis methods, recognizing their applicability, limitations, and sources of uncertainty
- Analyze and apply stress redistribution and induced stresses in caving mines to understand failure modes and guide support design and risk management
- Understand the mechanisms of failure in cave mining, including structurally controlled instability, rockbursting, and squeezing, and their implications for excavation stability and safety
- Evaluate the geological, geomechanical, and operational factors that govern failure processes, monitoring responses, and hazard development
- Analyze and apply design strategies to anticipate and mitigate rockburst and squeezing hazards, and support risk-informed excavation sequencing and support design

COURSE 3.2
BLOCK CAVING GEOMECHANICS RISK AND CASE STUDIES

CONTENTS

Day 9 (David Cuello – 10 December)

- A geomechanical risk framework
- Major geomechanical hazards
- Abutment stress
- Excavations in high-stress conditions
- Excavations in low-stress conditions

Day 10 (David Cuello – 15 December)

- TARP examples
- Case studies

Goals

- Identify and quantify the main geomechanical hazards in caving methods, understand their key limitations and control strategies, and develop the capability to effectively understand how to mitigate and manage them.
- Gain a comprehensive understanding of safety principles and critically evaluate the technical and economic challenges that influence safe and sustainable cave execution
- Understand the concepts of induced stress, fortification and caving mechanisms
- Understand the main geomechanical hazards in high stress and low stress environments

COURSE 3.3
NUMERICAL MODELLING IN CAVING MECHANICS

CONTENTS

Day 11 (Miguel Fuenzalida – 16 December)

- Numerical methods (Flac3D)
- Constitutive models

Day 12 (Miguel Fuenzalida – 17 December)

- Caving mechanics
- Monitoring of Cave Propagation
- Case studies

Goals

- Implement the concepts of induced stress, fortification and caving mechanisms in problem resolution using numerical modelling
- Understand the fundamentals and key inputs associated with each geomechanical risk
- Review and analyze case studies illustrating each geomechanical risk

COURSE 4.1
MINE SEISMICITY

CONTENTS

Day 13 (Dmitriy Malovichko - 12 January)

- Mine seismicity
- Objectives of seismic monitoring in mines
- Basics of mine seismology: seismic waves and seismic sources, processing of the data

Day 14 (Dmitriy Malovichko - 13 January)

- Seismic monitoring technologies
- Interpretation of seismic monitoring data

Day 15 (Dmitriy Malovichko - 14 January)

- Applications of seismic monitoring
- What can go wrong in seismic monitoring

Day 16 (Sergio Gaete - 19 January)

- Fundamentals of mine seismicity
- Caving mechanics
- Modeling temporal process
- Moment tensor
- Stress tensor
- Case studies

Goals

- Understand the fundamental principles of seismology and seismic monitoring in mines for non-seismologists illustrated with examples from real mining operations
- Participate in collaborative exercises relevant to mine seismicity

COURSE 5.1
FUNDAMENTAL DYNAMIC SUPPORT - GROUND SUPPORT DESIGN

CONTENTS

Day 17 (Javier Vallejos - 09 March)

- Fundamental dynamic support
- Design principles and methodology
- Ground support
- Behaviour of veined rock masses
- Ground support and reinforcement design methodology

Day 18 (Javier Vallejos - 10 March)

- Deformation-based support design
- Strain burst – rockburst – pillar burst
- Rockburst damage mitigation
- Effects of stress change on excavation and support performance
- Deformation-based support design

Goals

- Gain an understanding of rockbursts and their mechanisms.
- Relate the behavior of rock with the strainburst phenomenon
- Become familiar with design principles in geotechnical engineering
- Understand the functions of rock support in burst-prone ground
- Learn about the deformation-based support design approach

COURSE 5.2 - 5.3
PRECONDITIONING OF THE ROCK MASS

CONTENTS

Day 19 (Rigoberto Rimmelin – 11 March)

- Rock mass conditioning in the resource industry
- Mechanics of hydraulic fracturing: Fracture initiation
- Mechanics of hydraulic fracturing: Fracture propagation
- Benefits of rock mass conditioning in cave mining
- Monitoring of rock mass conditioning
- Monitoring and fragmentation control

Day 20 (Rigoberto Rimmelin - 16 March)

- Cave re-induction and cave extension
- Intensive pre-conditioning
- Pre-conditioning for mine development
- Conditioning integrated with undercutting
- New technologies for rock mass conditioning

Day 21 (Alex Catalan - 17 March)

- Preconditioning of the rock mass
- Hydraulic fracturing as a cave inducement technique
- Case studies

Goals

- Understand rock mass conditioning in cave mining, focusing on hydraulic fracturing mechanics, key applications of rock mass preconditioning, integration with undercutting, and cave re-induction

COURSE 6.1
CAVE MINE DESIGN

CONTENTS

Day 22 (Raúl Castro - 13 April)
- Gravitational flow principles
- Primary and secondary fragmentation
- Production level design

Day 23 (Raúl Castro - 14 April)
- Drawbell design
- Undercut level design
- LHD Systems and automation
- Material handling systems and simulation

Day 24 (Raúl Castro - 15 April)
- Mine recovery and dilution
- Mudrush and inrush of fines
- Hang-ups

Day 25 (Raúl Castro - 20 April)
- Extraction indicators
- Risk quantification

Day 26 (Raúl Castro - 21 April)
- Case studies

Goals
- Know and apply the key variables and parameters in the design of block/panel caving production levels
- Understand the safety issues, productivity and costs related to the production level design
- Understand the fundamentals in the undercut level design
- Understand and be able to manage the relationship between design and productivity
- Analyze risks associated with gravity flow and possible operational consequences

COURSE 6.2
AUTOMATION

CONTENTS

Day 27 (Javier Ruiz del Solar - 22 April)

- Basic definitions
- Autonomous equipment
- Impact hammer automation
- LHD systems and automation
- Service Equipment
- Challenges in mine automation

Goals

- Understand the benefits of automating mining operations
- Learn about the main technologies used to automate mining equipment
- Understand the state of the art in mining equipment automation
- Understand the main challenges of automating mining operations

COURSE 7.1
ROCK BLASTING AND EXCAVATION IN CAVING METHODS

CONTENTS

Day 28 (Juan Pablo Henríquez - 18 May)

- Fundamental concepts
- Explosives: type and characteristics
- Initiation systems
- Blasting engineering
- Emulsion: benefits and properties

Day 29 (Juan Pablo Henríquez - 19 May)

- Blast-induced vibrations
- Velocity of detonation
- Other types of instrumentation
- Single phase drawbells
- Methodology for drawbell design
- Special blasting to induce caving
- Rock mass preconditioning with explosives

Goals

- Understand the importance of the blasting process and its influence on proximal structures
- Understand explosive principles and safe, effective techniques for rock excavation
- Learn about blasting monitoring, based on vibration, velocity of detonation and QaQc
- Evaluate the effectiveness of perforation and blasting practices used for the construction of underground facilities
- Analyze case studies relevant to rock blasting and excavation

COURSE 7.2
ROCK BLASTING AND EXCAVATION IN CAVING METHODS

CONTENTS

Day 30 (Danko Morales - 20 May)

- Main concepts
- Blast design
- Bulk emulsion
- Electronic detonator systems
- Rapid development
- Drift design
- Constructability
- Typical construction cycle

Day 31 (Danko Morales - 25 May)

- General principles of production blasting design
- Undercut blasting
- Slot blasting
- Explosive charging for production blasting
- Rock mass preconditioning with explosives

Goals

- Understand the process of development blasting and how it generates connectivity between the different infrastructures and enables managing the needs of the mining system.
- Understand the process of undercut blasting design and charging and the importance during the production process in Block/Panel Caving mining.

COURSE 8.1 - 8.2
CAVE MINE VENTILATION

CONTENTS

Day 32 (Daniel Stinnette - 15 June)

- Introduction to mine ventilation
- Determining airflow requirements
- Calculating system resistance

Day 33 (Daniel Stinnette - 16 June)

- Planning of ventilation studies
- Airflow surveys
- Pressure surveys
- Air density determination
- Primary fan measurements

Day 34 (Daniel Stinnette - 17 June)

- Understanding fire risk
- Mine fire simulation, interpretation, and mitigation
- Emergency planning, communication, implementation
- Contaminant control strategies
- Contaminant simulation
- What is VOD?
- Elements of VOD systems
- Case studies

Goals

- Understand the basic theory of underground mine ventilation systems, with a special focus on the determination of the total airflow quantity required to support mining operations and the calculation of appropriate resistance values for commonly encountered mine tunnels and ventilation controls
- Learn the basic theory required for the planning and execution of ventilation studies and audits of existing and active underground mines
- Understand the components of a comprehensive fire study and strategies for effective control of contaminants in underground block cave mines
- Grasp elements of "Ventilation on Demand" or VOD systems for the monitoring and control of ventilation infrastructure using case studies supplemented by ventilation models of planned and operating block cave mines

COURSE 9.1
CAVE MINE PLANNING

CONTENTS

Day 35 (Alfonso Ovalle - 13 July)

- Overview of BC planning

Day 36 (Alfonso Ovalle - 14 July)

- Resource estimation
- Production rate
- Undercutting and draw bell sequence

Day 37 (Alfonso Ovalle - 15 July)

- Production plan and costs
- Development planning and costs
- Level design considerations
- Facilities required
- Equipment and personnel
- Mine planning and operational safety

Goals

- Obtain the necessary orientation and criteria to plan a safe, reliable, productive and profitable block cave mine operation
- Be able to implement the strategic aspects of mine planning
- Have the capacity to add value to traditional mine planning
- Understand the planning tools used in caving mining

COURSE 9.2 - 9.4
CAVE MINE PLANNING

CONTENTS

Day 38 (Raúl Castro - 20 July)

- Simulation/planning tools for caving - FlowSim.
- Gravitational Flow/ Caving
- Fines migration
- Secondary fragmentation
- Case studies

Day 39 (Daniel Villa - 21 July)

- What is a production schedule?
- Challenges of block caving
- Where/When in the block caving project life cycle
- Rethinking traditional mine planning & design with automation & simulation

Day 40 (Daniel Villa - 22 July)

- Planning tools for caving PCBC
- Case studies

Day 41 (Ian Edgar - 27 July)

- Horizontal design considerations
- Vertical development special considerations
- Mass excavation special considerations
- Schedule considerations and process
- The tragic history of plan of intent (POI)
- Design process
- Engineering document management

Goals

- Understand the strategic aspects to develop cave mine planning
- Have the capacity to implement the strategic aspects of mine planning
- Be able to add value to traditional mine planning
- Understand the planning tools used in caving mining

COURSE 10
CAVING PROJECT ANALYSIS

CONTENTS

Day 42 (Allan Moss - 17 August)

- Developing and operating deep cave mines: 50 years in the trenches
- Transitioning from open pit to underground mining
- Pre-production development in caving

Day 43 (Allan Moss - 18 August)

- Cave establishment.
- Rules for cave establishment: design and operation
- Production ramp-up
- Ramp-up risks

Day 44 (Allan Moss - 19 August)

- Steady state
- Case studies at Palabora and El Teniente
- Design evaluation processes, geotechnical assumptions, and project schedules
- The influence of technical reviews on investment and planning decisions

Day 45 (Alex Catalán- 24 August)

- Critical risk prioritization and decision-making in caving operation
- Case studies at El Teniente

Goals

- Understand the principal milestones and challenges in cave mine implementation through study cases
- Identify parameters for the successful implementation of caving projects
- Be able to determine the principal safety, management, production, economic, technical and environmental challenges and risks

COURSE 11
FINAL PROJECT

CONTENTS

Goal

The Final Project is to develop a case study integrating and applying the knowledge, methodologies, and technical tools acquired throughout the CED. The project must focus on Block/Panel Caving mining and address a real or conceptual challenge associated with mine design, planning, operation, geomechanics, ventilation, mine safety, or other technical areas related to caving operations.

Final Project Description

Through the Final Project, students will analyze a relevant problem or case of interest for the current caving mining industry. The objective is for students to apply the contents covered throughout the program in an integrated manner, demonstrating their ability to analyze technical information, interpret results, and propose conclusions or recommendations.

Depending on the focus of the case study, the work may include aspects such as mine design analysis, mine planning, geomechanical behavior, risk management, ventilation, operational safety, the use of technical tools, and/or the evaluation of engineering alternatives. This activity allows students to consolidate the learning outcomes of the CED through practical application, connecting academic content with the current challenges of caving mining.

TECHNICAL MINE VISIT

The Technical Mine Visit is a key component of the CED, designed to connect the technical knowledge developed throughout the program with real mining environments, operational practices, and applied decision-making in cave mining.

This experience provides participants with direct exposure to large-scale underground mining operations, allowing them to observe how concepts related to mine design, geomechanics, planning, ventilation, safety, production, and operational performance are applied in practice.

The visit is planned to include technical activities and mine visits connected to caving operations, including Chuquicamata and El Teniente or others, subject to operational availability and safety requirements.

OBJECTIVES

- Connect theoretical and technical concepts with real mining environments
- Understand how cave mining methods are implemented and managed in operational contexts
- Observe technical and operational practices related to underground mining performance
- Strengthen participants' understanding of the relationship between mine design, planning, safety, and production
- Promote discussion between participants, lecturers, and industry professionals around practical challenges in cave mining

EXPERIENCE

During the Technical Mine Visit, participants will take part in operational briefings, technical discussions, and applied learning activities. This experience allows students to complement the online academic program with a field-based perspective, reinforcing the connection between technical knowledge, industry practice, and real operational challenges.

**Technical visit locations, schedules, activities, and access conditions are subject to confirmation, operational availability, and safety requirements.*

APPLICATION AND ADMISSION

Program Start Date

The program starts in October 2026.

Program slots are assigned according to order of registration and compliance with the following requirements:

- Notarized photocopy of bachelor's degree or post-graduate degree in mining or in a related discipline
- Updated CV

Each application will be reviewed by the Academic Program Committee. All application documents must be sent to diploma.caving@ing.uchile.cl

Language and platform

- All classes are taught in English.
- Classes will be delivered and recorded through the Zoom Platform.
- The program's flexible structure enables participants to balance their studies with their professional and personal commitments.
- Classes will be recorded, and students will have access through the U-Cursos Platform of the University of Chile.

Tuition Fees

- The tuition fee for the CED program is USD 20,000 per student.
- Payment can be made via electronic transfer or Webpay (Visa or Mastercard).
- For company-sponsored students, a purchase order (PO) must be submitted to formalize the CED application.

Important note: Dates, schedules, lecturers, course content, technical visit details, and other program information are subject to change. The final version of the program will be officially communicated through the program's official channels.

Program Information

Start Date: October 2026

Finish Date: September 2027

Total Time: 220 Hours

Format: Online + Technical Mine Visit

Platform: Zoom

Academic Coordination: A. Professor Raúl Castro

Executive Coordination: Fidel Báez

Email Contact: fidelbaeznunez@gmail.com

Language: English

Organizing Institution: University of Chile

Postgraduate School and Continuous Education

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