Virtual Technical Courses- Minexcellence 2025

Time Zone Santiago, Chile. GMT -3

Thursday, November 27

	PRE-CONGRESS ACTIVITIES	
Course 1	**Free access for registered to the conference**	
14:00 – 17:30	SPA **Simulation applied to drilling and blasting in mining** Andrés Pardo, Academic, Department of Mining Engineering, Universidad de Atacama, Chile	UNIVERSIDAD DE ATACAMA

Friday, November 28

Course 2	**Free access for registered to the conference**	
10:00 – 13:30	SPA **Sustainable processing of lithium brines** María Belén Barraza, Academic, Department of Mining, Metallurgy and Materials Engineering and Rodrigo Rubilar, Civil Mining Engineer, Master's Student in Metallurgical and Mining Engineering Sciences, Universidad Técnica Federico Santa María, Chile	UNIVERSIDAD TECNICA FEDERICO SANTA MARIA

Course 3	**Free access for registered to the conference**	
15:00 – 17:20	ENG **Open Pit Mine Design: Fundamentals & IPCC Optimization** Alireza Kamrani, Postdoctoral Fellow, University of Alberta, Canada	UNIVERSITY OF ALBERTA

COURSE 1: Simulation applied to drilling and blasting in mining

Andrés Pardo Labrín
Academic, Department of Mining Engineering, Universidad de Atacama, Chile

WHEN	LENGUAGE	LENGTH
Thursday, November 27	Spanish	3 hours and 30 minutes

DESCRIPTION

The course provides a comprehensive overview of simulation applied to drilling and blasting processes in mining, covering different approaches and methodologies used in the industry. Through three progressive modules, the course covers the theoretical foundations, modeling of the elements involved in the process, and analysis of results obtained using specialized tools.
Upon completion, participants will acquire the skills to develop, interpret, compare, and apply simulations aimed at optimizing drilling and blasting design.

GENERAL OBJETIVES

1. Understand the physical, mathematical, and computational principles that underpin simulation applied to drilling and blasting, differentiating according to the approach used.
2. Apply modeling methodologies that integrate the components of the drilling and blasting system.
3. Analyze simulation results applied to the drilling and blasting process, identifying the advantages and limitations of each approach.

CONTENT AND PROGRAME

14:00 - 14:50	**Module 1: Fundamentals of simulation**	Andrés Pardo
14:50 - 15:00	Questions and discussion Module 1	
15:00 - 15:10	Break 1	
15:10 - 16:00	**Module 2: Modeling the elements**	Andrés Pardo

16:00 - 16:10	Questions and discussion Module 2	
16:10 - 16:20	Break 2	
16:20 - 17:10	**Module 3: Application and analysis of results**	Andrés Pardo
17:10 - 17:20	Questions and discussion Module 3	
17:20 - 17:30	**Conclusions and closure of the course**	Andrés Pardo

LECTURER BIO

Andres Pardo is a professor in the Department of Mining Engineering at the University of Atacama, with over fifteen years of experience in the fields of mining and construction. He holds a degree in Mining Engineering from the University of Atacama and a PhD (c) in Engineering and Science with Industry from the Pontifical Catholic University of Chile. He has complemented his training with diplomas and specialized courses aimed at strengthening skills in the field of applied engineering.

Professionally, he has led and held various roles related to project management, direction, and supervision, in addition to participating in advisory and consulting projects for both national and transnational companies.

Academically, he has served as a professor, lecturer, and advisor in undergraduate and continuing education programs, teaching subjects related to engineering and applied sciences. He has actively participated in research, development, and innovation projects, as well as in initiatives related to community engagement and technology transfer. In addition, I have contributed to the supervision of theses and dissertation projects and have participated in and published in conferences and specialized journals.

In recent years, I have promoted collaboration between the public, private, and academic sectors through R&D initiatives focused on optimizing systems and processes, with the aim of strengthening the productivity and sustainability of the mining industry.

COURSE 2: Sustainable processing of lithium brines

María Belén Barraza
Academic, Department of Mining, Metallurgy and Materials Engineering, Universidad Técnica Federico Santa María, Chile

Rodrigo Rubilar Cortez
Civil Mining Engineer, Master's Student in Metallurgical and Mining Engineering Sciences, Universidad Técnica Federico Santa María, Chile

WHEN	LENGUAGE	LENGTH
Friday, November 28	Spanish	3 hours and 30 minutes

DESCRIPTION

This technical course introduces the conceptual and computational tools necessary to understand and model lithium brine extraction and processing processes from a sustainable perspective.

Drawing on teaching and research experiences from the Department of Mining, Metallurgy, and Materials Engineering (DIM3) at the Federico Santa María Technical University, the course addresses the hydrogeochemical foundations and numerical models that support responsible lithium production, integrating elements of thermodynamics, water balance, and environmental analysis.

It combines theoretical presentation, demonstrations using specialized software, and discussion of real-life cases from salt flats in northern Chile.

GENERAL OBJETIVES

1. Understand the physical, chemical, and hydrogeological foundations that govern the behavior of lithium brines.
2. Apply basic computational modeling tools to analyze concentration and extraction processes.
3. Evaluate sustainable strategies for brine processing, considering efficiency and minimizing environmental impacts.

CONTENT AND PROGRAME

10:00 - 10:50	**Module 1: Fundamentals of lithium brines and water balance in salt flats**	Rodrigo Rubilar
10:50 - 11:00	Questions and discussion Module 1	
11:00 - 11:10	Break 1	
11:10 - 12:00	**Module 2: Sustainable brine processing and emerging technologies**	Ma. Belén Barraza
12:00 - 12:10	Questions and discussion Module 2	
12:10 - 12:20	Break 2	
12:20 - 13:10	**Module 3: Hydrogeological computational modeling and scenario projection**	Rodrigo Rubilar y Ma. Belén Barraza
13:10 - 13:20	Questions and discussion Module 3	
13:20 - 13:30	**Conclusions and closure of the course**	Ma. Belén Barraza

LECTURER BIO

Dr. María Belén Barraza Sandoval is an Assistant Professor in the Department of Mining, Metallurgy, and Materials Engineering (DIM3), UTFSM. She holds a PhD in Engineering Sciences with a focus on Fluid Dynamics (University of Chile) and a degree in Chemical Civil Engineering (UTFSM). Her research interests include applied fluid dynamics, solid-liquid separation process modeling, and the development of sustainable mining technologies. In this course, she addresses the analysis of brine processing and the integration of sustainability criteria in the modeling of saline systems.

Rodrigo Rubilar Cortez is a Mining Civil Engineer (UTFSM) and a student of the Master of Science in Metallurgical and Mining Engineering (DIM3, UTFSM). He specializes in hydrogeological computational modeling applied to lithium brine systems. His expertise combines numerical simulation, water balance, and geochemical analysis, with a focus on the use of open-source software and model validation in real-world salt flat environments in northern Chile.

COURSE 3: Open-Pit Mine Design: Fundamentals & IPCC Optimization

Alireza Kamrani
Postdoctoral Fellow, University of Alberta, Canada

WHEN

Friday, November 28

LENGUAGE

English (with Spanish interpretation)

LENGTH

2 hours and 20 minutes

DESCRIPTION

This short course covers the essentials of open-pit mine design and illustrates how In-Pit Crushing and Conveying (IPCC) can be integrated into long-term planning to improve haulage efficiency and project value. Drawing on core material from Open-Pit Design and Optimization and the instructor's PhD research, participants will review pit limit, pushbacks, slope and ramp design, and then examine an MILP-based framework that jointly considers road and conveyor networks. A real-sized iron ore case study is used to compare scenarios (No IPCC, Ore IPCC, Waste IPCC, and Ore & Waste IPCC), highlighting haul distance reductions, NPV impacts, and practical implementation considerations.

GENERAL OBJETIVES

1. Understand the foundational elements of open-pit design: ultimate pit limits, pushbacks, geotechnical slopes, and haul ramp geometry.
2. Learn how IPCC options can be incorporated into strategic planning and long-term scheduling using optimization (MILP) with road and conveyor networks.
3. Interpret scenario results (NPV, haulage metrics, schedule changes) and identify when IPCC is economically and operationally advantageous.

CONTENT AND PROGRAME

03:00 - 03:50	**Module 1 – Open-Pit Design Fundamentals (pit limit & pushbacks; slope & ramp design; truck haulage basics).**	Alireza Kamrani
03:50 - 04:00	Questions and discussion Module 1	
04:00 - 04:10	Break 1	
04:10 - 05:00	**Module 2 – IPCC Integration & Optimization (MILP model, road+conveyor networks, case study & scenarios).**	Alireza Kamrani
05:00 - 05:10	Questions and discussion Module 2	
05:10 - 05:20	**Conclusions and Closure of the Course**	Course Coordinator

LECTURER(S) BIO

Dr. Alireza Kamrani is a Postdoctoral Fellow at the University of Alberta specializing in open-pit mine planning, MILP-based long-term scheduling, and In-Pit Crushing & Conveying (IPCC) optimization. He has co-instructed Open-Pit Mine Design and Optimization (MIN E 325) and Underground Mine ventilation (MIN E 407), and his work includes a real-sized iron ore case study comparing IPCC scenarios and their impacts on haulage and NPV. He has published in high-impact venues and collaborates with industry partners on planning and digital mining technologies.