VIRTUAL TECHNICAL COURSES PRIOR TO MINERÍA DIGITAL 2024

MONDAY, JULY 01
10:00 AM – 12:20 PM

COURSE 1:
"ARTIFICIAL INTELLIGENCE IN CHILEAN MINING"

Mary Torrico, Academic, Universidad de Tarapacá, Chile; **Julie Supanta,** Academic, Universidad de Tarapacá, Chile

Language: Spanish

TUESDAY, JULY 02
10:00 AM – 14:00 PM

COURSE 2:
"INTRODUCTION TO DATA ANALYTICS FOR BENCHMARKING PROCESS PERFORMANCE"

Mohsen Yahyaei, Academic of the Julius Kruttschnitt Mineral Research Centre, The University of Queensland, Australia

Language: English

TUESDAY, JULY 02
15:00 PM – 17:00 PM

COURSE 3:
"ELEMENTS OF UNCERTAINTY MODELING AND RISK ASSESSMENT IN MINING AND METALLURGY"

Alejandro Ehrenfeld, Researcher at ALGES-AMTC, Universidad de Chile; and **Gonzalo Díaz,** Researcher at ALGES-AMTC, Universidad de Chile

Language: Spanish

COURSE 1: "Artificial intelligence in Chilean mining"

When: Monday. July 01, 2024
Instructors: **Mary Torrico,** Academic, Universidad de Tarapacá, Chile; **Julie Supanta,** Academic, Universidad de Tarapacá, Chile
Language: Spanish
Time: **10:00 AM – 12:20 PM** (Chilean time zone)

Description: Mining in Chile has been a fundamental component of the country's economy for decades. With vast deposits of copper, gold, silver and other minerals, Chile has positioned itself as one of the world's leading producers. However, the mining industry faces significant challenges in terms of efficiency, safety and sustainability. Taking into account the reality of Chilean mining, the use of artificial intelligence is seen as a key tool to optimize mining operations. The implementation of artificial intelligence systems in Chilean mining has the potential to improve productivity, predict and prevent equipment failures, and reduce risks for workers. This course will explore the potential impact of artificial intelligence in the Chilean mining industry, as well as the challenges and opportunities arising from its implementation. Chilean mining is facing issues such as the need to explore and develop more complex deposits, and artificial intelligence has the potential to revolutionize the way these challenges are addressed.

GENERAL OBJECTIVES

- Explore the specific applications of artificial intelligence in the Chilean mining industry.
- Evaluate the importance and benefits of the application of artificial intelligence in mining.
- Analyze the challenges and opportunities of implementing artificial intelligence in Chilean mining.

CONTENTS AND PROGRAM

10:00 - 10:50	**Module 1:** The Chilean mining industry	Julie Supanta
10:50 - 11:00	Questions and discussion Module 1	Julie Supanta
11:00 - 11:10	BREAK	
11:10 - 12:00	**Module 2:** Artificial intelligence applied to the Chilean mining industry	Mary Torrico
12:00 - 12:10	Questions and discussion Module 2	Mary Torrico
12:10 - 12:20	Conclusions & closure of the course	

LECTURERS' BRIOGRAPHIES

Mary Torrico, Mechatronics Engineer, currently pursuing a Master's degree in Artificial Intelligence applied to the energy and infrastructure sector. She currently works as a professional at Universidad de Tarapacá, in the Department of Mechanical Engineering; is part of a FIC project awarded at the same university: "Implementation of an Integral Recycling Center for Plastic Waste in the Region of Arica and Parinacota"; and was also awarded internal funding from the university to develop a monitoring prototype within the port of Arica. She is in charge of the Women's Leadership axis of the Consorcio Ingeniería 2030 UV-UTA project and supports the Technovation Girls program.

Julie Supanta, Civil Engineer in Mining, graduated from Universidad de Atacama, with previous experience in important mining companies such as Collahuasi and Radomiro Tomic, Codelco, where she has provided significant solutions in the mining field. She currently deploys her experience as a teacher at Universidad de Tarapacá, in the Department of Mechanical Engineering, and as manager of multiple service provision projects, collaborating with state and private sector entities. She is also an active participant in the FIC project "Implementation of an Integral Recycling Center for Plastic Waste in the Region of Arica and Parinacota", demonstrating her commitment to innovation and sustainable development in the region.

COURSE 2: "Introduction to data analytics for benchmarking process performance"

When: Tuesday. July 02, 2024
Instructors: **Mohsen Yahyaei,** Professor of the Julius Kruttschnitt Mineral Research Centre, The University of Queensland, Australia
Language: English
Time: **10:00 AM – 14:00 PM** (Chilean time zone)

Description: This short course provides metallurgists and plant managers with a basic understanding of data analytics and tools that can be utilized for processing plant data to benchmark the performance of the process and identify opportunities for improvement.

Participants of this short course will be able to gain an introductory understanding of data cleaning and analysis of process data to calculate the stability of various operating units in a mineral processing circuit and calculate performance indicators for mineral processing units.

GENERAL OBJECTIVES

- Introduce principles of data analytics.
- Learn common terminologies in data analytics.
- Learn basics of data cleaning.
- Learn how to perform data analysis.
- Learn how to perform benchmarking analysis.

CONTENTS AND PROGRAM

10:00 - 10:30	Introduction	Mohsen Yahyaei
10:30 - 11:20	**Module 1:** What is data analytics	Mohsen Yahyaei
11:20 - 11:30	Questions and discussion Module 1	Mohsen Yahyaei
11:30 - 11:40	BREAK 1	
11:40 - 12:30	**Module 2:** Basics of data cleaning	Mohsen Yahyaei
12:30 - 12:40	Questions and discussion Module 2	Mohsen Yahyaei
12:40 - 12:50	BREAK 2	
12:50 - 13:40	**Module 3:** AI and ML for transforming data to Information	Mohsen Yahyaei
13:40 - 13:50	Questions and discussion Module 3	Mohsen Yahyaei
13:50 - 14:00	Conclusions & closure of the course	

LECTURER'S BIOGRAPHY

Mohsen Yahyaei is a distinguished expert in the field of mineral processing circuits, specialising in innovative approaches and tools for modelling, optimisation, and control. He holds a prominent position at the Julius Kruttschnitt Mineral Research Centre (JKMRC) at the prestigious University of Queensland in Australia.

He has designed and delivered comprehensive training programs that bridge the gap between theoretical knowledge and practical application in data analytics and process improvement. His courses are renowned for their ability to equip metallurgists with the skills necessary to navigate the intricacies of modern data analysis tools and techniques. The global reach of these courses underscores their significance and reflects Professor Yahyaei's commitment to fostering a new generation of data-savvy professionals in the mineral processing industry.

COURSE 3: "Elements of uncertainty modeling and risk assessment in mining and metallurgy"

When: Tuesday. July 02, 2024
Instructors: **Alejandro Ehrenfeld,** Researcher at ALGES-AMTC, Universidad de Chile; and **Gonzalo Díaz,** Researcher at ALGES-AMTC, Universidad de Chile
Language: Spanish
Time: **15:00 PM – 17:00 PM** (Chilean time zone)

Description: This course will address the concept of uncertainty, in the context of mining and metallurgical activity, to invite attendees to reflect on the subject, with the aim of combining language and providing a vision on how to model uncertainty and how to use such modeling for decision making in different areas. Some application examples will be shown.

GENERAL OBJECTIVES

- Transmit to the audience a formal concept of uncertainty in the context of the different stages of mining and metallurgical activity.
- Provide a vision about uncertainty modeling alternatives.
- Reflect and provide elements on the relationship between uncertainty, risk and decision making.

CONTENTS AND PROGRAM

15:00 - 15:50	**Module 1**	Alejandro Ehrenfeld
15:50 - 16:00	Questions and discussion Module 1	Alejandro Ehrenfeld
16:00 - 16:10	BREAK	
16:10 - 16:50	**Module 2**	Gonzalo Díaz
16:50 - 17:00	Questions and discussion Module 2	Gonzalo Díaz

LECTURERS' BRIOGRAPHIES

Alejandro Ehrenfeld, Electrical Engineer with 15 years of experience in research applied to mining, in the fields of information systems and stochastic spectroscopy applied to geometallurgy.

Gonzalo Díaz, Electrical Engineer and Mining Engineer, has 10 years of experience in applied research in mining, in the areas of geostatistics and modeling of metallurgical processes, as well as image analysis in mining context.

Both work as Associate Researchers at the Geostatistics and Supercomputing Laboratory – ALGES, part of the Advanced Mining Technology Center (AMTC) and the Mining Engineering Department of the University of Chile.