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

Diploma in Mine Planning



Version: October 2016

Director: Prof. Juan Luis Yarmuch

Presentation

The Department of Mining Engineering, together with the Applied Research Mining Operation Center (CIOMIN in Spanish) offers the **Diploma in Mine Planning**.

The program is oriented to **engineers, geologists and others related engineering professionals**. This program provides students with a broad-based fundamental knowledge of geomechanics, reserves evaluation, design and planning of underground and open pit mines, optimization and logistics applied to mining, and risk analysis for decision making. It is also designed to **strengthen students' communication, problem-solving, critical thinking, and teamwork skills**.



Objectives

The objective of the Diploma is to provide students with state-of-the-art and advanced theoretical and practical tools for mine planning. At the end of the program the student will have acquired the tools to add value to the entire chain of the mining business

Location: Department of Mining Engineering, Faculty of Physical and Mathematical Sciences - Universidad de Chile, Av. Tupper 2069, Santiago.

Time: Monday to Friday from 9:00 to 13:00 and from 14:00 to 18:00.

Contact: Ingrid Thiele - Verónica Möller

diploma@minas.uchile.cl

Phone number: (+562) 2978 4503

Note 1: *The Department of Mining Engineering has the right to suspend the Diploma if the number of students is not enough to ensure minimum administrative conditions and the quality of the program.*

Note 2: *If one of the lecturers or professors needs to be replaced, the program has the commitment to find a new one with similar background.*

Course description

The Diploma considers 6 modules of one-week length (240) covering different areas of **Mine Planning** and personal work (60 hours) between modules. Here you can find a brief description or contents of the courses of the Diploma. Courses consider among their activities exercises with the supervision of assistants.

Students are required to have adequate English language skills so that they can study the complementary material.

1. Geomechanics

Introduction to Geomechanics. Geomechanics applied to underground. Geomechanics applied to open pit mines.

2. Geostatistics applied to Ore Body Evaluation

Exploratory analysis. Definition of geological units. Variography. Local estimation. Kriging.

3. Open Pit Mine Design and Planning

Economic envelope estimation. Operational phases design. Mine plans and cut-off grade. CAPEX and OPEX estimation. Economic evaluation and risk analysis.

4. Underground Mine Design and Planning

Introduction to Underground mining. Block/panel caving mine design. Block/panel caving mine planning. Design and mine planning of self-supported mines design.

5. Risk Analysis and Decision Making in Mining

Introduction and statistics. Identification, measurement and market risk management.

6. Optimization and Logistics in Mining

Dynamic programming. Linear programming. Non-linear optimization. Provisions/inventories. Routes and transportation capacity.

Each program's module will be evaluated through tests/readings/presentations/reports and/or a final exam. The minimum passing grade is 4,0 on a scale from 1,0 to 7,0.

Professors and Lecturers

- **Ing. Ernesto Arancibia**, Mining Engineer, University of Chile
- **Prof. Javier Vallejos**, Civil Engineer, Ph.D., Queen`s University
- **Prof. Raúl Castro**, Mining Engineer, Ph.D., The University of Queensland
- **Alejandro Cáceres**, Geologist, Master Universidad de Chile
- **Prof. Xavier Emery**, Ph.D. Ecole Nationale Supérieure des Mines de Paris,
- **Prof. Rafael Epstein**, Ph.D. Massachusetts Institute of Technology,
- **Ing. Hugo Martínez**, Mining Engineer, University of Chile
- **Ing. Manuel Rapiman**, Mining Engineer, University of Chile
- **Dr. José Saavedra-Rosas, Mathematical Engineer**, Ph.D. Mineral Economics Laurentian University
- **Prof. Juan Luis Yarmuch, Mining Engineer**, Ph.D (c) Engineering, The University of Melbourne

Application and Admission Requirements

There are a restricted number of positions and are offered in strict order of registration. Candidates fulfilling the following requirements, may apply to the Diploma:

- Hold a bachelor degree in a discipline related to the program. They may also apply those who hold a professional degree which level, content and duration of studies correspond to an equivalent to the degree of Bachelor of the University of Chile.
- Curriculum Vitae
- Application Form
- Sponsor letter (company`s financing) and payment order

Each application will be resolved by the Academic Director of the Program, who will decide the acceptance or decline of the admission, based on the information presented.

Interested people registering the Diploma must apply to the program by sending the documents describe above to: **diploma@minas.uchile.cl**

Fees

CLP 5.900.000.- (US\$ 9,000), per student

- All candidates must pay an enrollment fee of US\$ 500 -CLP \$ 350,000. This amount will be discounted from the total cost.
- Students that are sponsored by their companies must send a letter of support and a payment order.

Certification

After requirements are fulfilled, the student will receive a **Diploma in Mine Planning**, issued by the Faculty of Physical and Mathematical Sciences of the University of Chile.