

PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
COLLEGE OF ENGINEERING
DEPARTMENT OF MINING ENGINEERING
ABET COURSE SYLLABI

IMM2013 OPEN PIT MINING

Credits and contact hours:	10 UC credits / 10 hours (3 h. Lectures and 7 h. Independent learning experiences)
Instructor's name:	Julio Beniscelli
Course coordinator's name	Ronald Guzmán
Textbook:	Open pit mine planning & design. Revised and extended 2nd edition. William Hustrulid, Mark Kuchta, 2006
Course Catalog Description:	In this course, the fundamental concepts and tools of open pit mining are presented so that the student develop the necessary competences to evaluate the best design of a mine, considering the safety and integrity of the people and pursuing its maximal benefit.
Prerequisite Courses:	IMM2003 Mining geology or ICE2623 Introduction to physical geology
Co-requisite Courses:	None
Status in the Curriculum:	Required
Course Learning Outcomes:	Learn historical aspects of the mining industry in Chile and develop skills such as examining, planning and valuing a mine from a block model, and as the phase sequencing, understanding all the science behind it. All engineering developed during the course will be conditioned to the safety and integrity of people, environment, infrastructure and equipment.
Relation of Course to ABET Criteria:	a. Knowledge of mathematics, science and engineering b. Design and conduct experiments: analyze and interpret data c. Design a system, component, or process e. Identify, formulate, and solve engineering problems f. Professional and ethical responsibility g. Effective communication h. Broad education necessary for global, economic, environmental and societal context j. Knowledge of contemporary issues k. Techniques, skills, and modern tools for engineering practice.

Topics covered:

1.- Introduction to mining.

Why we mine? The need for material The demand for raw materials and economic growth.

Where we mine? From target to anomaly.

The processes required to obtain a salable product.

Cutoff concept and referrals.

2.- Resources and Reserves

Tonnage-Law Curves and Cutover Law.

Context of managing an open pit mine. Timing model.

Vulcan: CAD and Database

Optimal envelope, Cost vectors.

3.- Pit limits

Geotechnical and economic parameters

Mine-Plant capacities and its impact on the design.

Mine sites: Components and geometry.

Optimal directional trend.

Vulcan: Block model. Pit optimizer.

4.- Mining Design

Phase sequencing

Reserves consumption diagrams.

Vulcan: Best and worst case. Pit design, phases and ramps.

5.- Long term and short term Mining plan.

Construction, synthesis and evaluation of a mining plan.

Vulcan: Sequencing, accumulation and production plan report