

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

IMM2033 GEOSTATISTICS

Credits and contact hours:	10 UC credits / 10 hours (3 h. Lectures; 1.5h. site visit and 5.5h. Independent learning experiences)
Instructor's name:	Marcelo Arancibia y José Joaquín Jara
Course coordinator's name	José Joaquín Jara Donoso
Textbook:	<ul style="list-style-type: none">- Geoestadística Lineal, Emery, X., 2000.- Mineral Deposit Evaluation: A Practical Approach. Annels, A., 1992.- An Introduction to Applied Geostatistics, Isaaks y Srivastava, 1989.- Mining Geostatistics, Journel, A.G., 1978.
Course Catalog Description:	Introduce students into the theory of regionalized variables and provide them theoretical and practical tools for the evaluation of mineral resources using geostatistical methods.
Prerequisite Courses:	IMM2003: Mining Geology and EYP1113: Probability-Statistics
Co-requisite Courses:	None
Status in the Curriculum:	Required
Course Learning Outcomes:	Know the basics concepts in sampling theory. Understand regionalized processes and its implications for mineral resources evaluation. Know and apply traditional tools and geostatistical techniques to theoretical and practical problems in mineral resources evaluation. Understand the relevance and implications of mineral resources categorization.
Relation of Course to ABET Criteria:	<ul style="list-style-type: none">a. Knowledge of mathematics, science and engineeringb. Design and conduct experiments: analyze and interpret datac. Design a system, component, or processj. Knowledge of contemporary issuesk. Techniques, skills, and modern tools for engineering practice.

Topics covered:

1. Introduction to deposit evaluation. General concepts.
2. Sampling and mining-geological variability phenomena. Variability origin.
3. Probabilistic models: normal distribution and log-normal distribution.
4. Data collection and geological model.
5. Sampling: Theory and techniques. Gy's theory.
6. Overall evaluation of mineral deposits. Support effect.
7. Introduction to regionalized variables: variogram, covariogram and mathematical representations of variograms. Adjustment.
8. Local evaluation and classic methods: polygons, inverse distance.
9. Estimation Error.
10. Simple Kriging, Ordinary Kriging and Universal Kriging. Co-Kriging.
11. Codes and categorization of mineral resources and reserves.
12. Conditional Simulation