Methods of exploration / Méthodes d’exploration

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Cet enseignement est proposé dans les orientations suivantes :
Géochimie, Tectonique alpine, Gîtes métallifères / Geochemistry-Alpine Tectonics-Ore Deposits


1. Objectifs et contenu de l’enseignement

Aim of course: Practical understanding of the procedure of exploring a mineral prospect, based on geological analysis, exploration by drilling, resource calculation of tonnage and grade as a basis for economic evaluation for reporting to investors.

Program and course structure: This practical course in mineral exploration will comprise 4 half-day lectures and a series of practical exercises from selection of a mineral property to discovery of mineral resources and their valuation. Teams are formed as Limited Partnership companies that have to select and bid for a mineral property offered during an auction. Each company has the same nominal budget. The highest bidder purchases the selected property, others need to purchase the remaining properties during an auction. Justification for selecting the property is justified in a report. The companies must interpret the geology of their mineral property to prepare a diamond drill program to discover and, eventually, delineate the mineral resources. This drill program is presented in a report prior to drilling. Drilling in the tri-dimensional matrix of the property is simulated using the software FOREUR, until budget lapse. The companies must select drill intervals for chemical analysis to document the extent and composition of the discovered mineralization. Portions of the mineral rights can be traded for capital between the companies. An estimate of the tonnage and grade of the discovered resource is prepared using geometric methods and GIS software (ex. Arc GIS). The ground value of the resource is estimated by a computation of the Net Smelter Return at current metal prices. The results of the exploration program are presented in a comprehensive report.

Prerequisite: Knowledge of mineral deposit-type characteristics is useful (orogenic gold, Cu-Zn VMS, Ni-Cu-PGE; at least Ressourcen der Erde at ETH or Gîtes Métallifères at ELSTE), but adequate knowledge of mineral deposits for the purpose of the course can be acquired by preparatory reading. Basic knowledge of ArcGIS software is important to produce maps and sections required in reports. Training exercises and tutorials will be provided in advance to prepare for the course.

2. Pré-requis : basic geological and mineral deposit knowledge

3. Crédits ECTS