



EXPLOITATION OF MINERAL DEPOSIT

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Work load: 25h Theory (lectures), 15h Practice, 2d FW

Number of credits: 5 ECTS

Course code: GEOL0097-2

Source: <https://www.programmes.uliege.be/cocoon/20202021/en/cours/GEOL0237-2.html>

► *Course contents:*

This course is mainly an introduction to the extractive industry : underground mines, open pits and quarries (excluding oil and gas extraction). It is taught in English.

The mining industry extracts metallic ores and other important commodities (i.e. fertilizer precursors), solid fuels, industrial minerals and construction materials. The course introduces an overview of the very large span of operation methods and equipment used.

The course begins with a presentation of the markets of several important commodities, and the main factors which sustain them and ensure their growth.

The presentation of the technical aspects, of the necessary equipment and of the exploitation methods, in relation to the geology of the deposits, is the core part of the course.

Several other subjects are also presented : safety, environmental impact, cost optimization, stability (or adequate planning) of the mine production for the internal or external end user, inclusion of the activity in the socio-economic environment.

Unlike to numerous classical university level subjects, this course content is quite different and doesn't focus on a specific science or technique, but describes an **industry** in all its complexity, sometimes ignored or not so well understood, sometimes rejected by the general public.

Contrary to popular belief, the mining industry plays an essential role in the global economy. Our societies are greedy for raw materials, and societal issues related to this industry will continue to weigh heavily in our near and distant future. At world scale, our needs in raw materials and their flows around the world are enormous, and constantly growing.

Beyond the technical knowledge, the course aims to convey other ideas:

- Mining is a leading industry, always actively looking for new technologies (sometimes as a precursor) and economic performances
- necessarily it will continue to be one of the pillars of the development of our societies
- the highest priorities of the mining industry are to provide a healthy and safe workplace as well as environmental sustainability



- the smooth functioning of this industry necessarily requires an understanding and mutual respect between the parties (stakeholders): the mining company, firstly, and on the other hand: the national authorities (sometimes supranational: UN, World Bank, ...), the company workforce, the local communities, the local and international NGOs, the economic operators around the mining operation, ...

► *Intended Learning Outcomes:*

A the end of the course, you should be familiar of a mining environment, mastering the following acquired knowledge: techniques, vocabulary (in French and in English *), environmental intricacies, societal issues.

You will have in hand the basic notions to assess the importance of an exploration discovery, in view of its possible development as a mining project, or assess the economic importance of a project as presented by its promoters.

► *Prerequisites and co-requisites:*

General geology
Mineralogy
Mineral resources

Mineralurgy (a summary on the processes will be given early in the course (but not part of the course), intended mainly to the students in the geological sciences master)

► *Mode of delivery (face-to-face; distance-learning):*

Face to face (ex cathedra course)
Presentations by the students
Field visits

► *Recommended or required readings:*

N/A

► *Assessment methods and criteria:*

50 % : oral exam, two main questions

20 % : written test on the specific mining vocabulary and acronyms (in French and in English) - test organised together with the oral exam

15 % : one presentation per student (presented within the practical session marks) : topic to choose on a list including various fields of interest linked to mining:

- mining commodities (+ one of two relevant examples of operation)
- mining countries: a review on present mining operations and exploration under way
- a review of some specific mining technologies



- general topics linked to the mining industry

15 % : a group presentation on a broad topic with a wide range of subtopics.

► *Contribution to EIT's Overarching Learning Outcomes:*

OLO 1: Understanding the various technical options for the extraction of resources and the social and environmental impact of different scenarios

OLO 3: Creative combination of a variety of technologies to achieve the most efficient extraction of a mineral deposit

OLO 4: Special focus on the need for digitization in the extractive sector