

SYLLABUS

Geometallurgy 7.5 credits

M7008K

Geometallurgi

Course syllabus admitted: Autumn 2023 Sp 1 - Present

DECISION DATE
2023-06-02

Geometallurgy 7.5 credits M7008K

Geometallurgi

Second cycle, M7008K

Education level
Second cycle

Grade scale
G U 3 4 5

Subject
Mineralteknik

Subject group (SCB)
Chemical Engineering

Main field of study

Geosciences

Entry requirements

Bachelor or 3 years of studies in the program Sustainable Process Engineering (IMP) or equivalent knowledge from practical experiences (min 5 years work experience within process engineering or geology/mineralogy)
Documented skills in English language.

Selection

The selection is based on 30-285 credits

Course Aim

The course aims at giving an introduction to the three subject areas geology, process mineralogy and mineral processing out of geometallurgical perspective as the common thread. The course shall primarily address Sweden's ore types and processes but also take up other ore types.

After completion of the course the student should be able to:

- Identify and describe different ore types and their forming processes
- Analyze mineral properties of ores with respect to efficient beneficiation,
- Describe and explain the unit operations that are used within ore processing,
- Analyze the reasons for process selection based on the raw material properties,
- Describe the prerequisites for setting up a geometallurgical model and explain its elements.

Contents

Geology:

- Minerals and rock types: ore geology of the most typical ores of Sweden;

Process mineralogy:

- Characterization of ore minerals and metallurgical products (composition, mineral textures, liberation) based on optical microscopy, electron microscopy in combination with quantitative analyses (Quemscan), XRD;

Mineral processing:

- Basic principles for unit operations; selection of equipment, link to process mineralogy, mineral processing test work;

Metallurgy:

- Basic principles for metal production, product properties, customer needs and quality;

Geometallurgical modeling:

- Geostatistics, process modeling in mineral processing and metallurgy, particle based material balancing.

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

Teaching comprises lectures, seminars, lab exercises with assignments, as well as study trips. Participation is compulsory with the exception of the lectures.

The lectures should provide the possibility for the students to be able to describe and explain the theory and relation between the mineralogy of different ores and the beneficiation processes.

Lab exercises in geology, process mineralogy and mineral processing are conducted in groups. Study trips shall provide the possibility for the students to learn to explain advanced mineralogical investigations and technological test methods.

Seminars are devoted to describe, analyze, interpret and present a complex topic in the field of geometallurgy.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.

Lab exercises and the seminars are compulsory. Lab exercises and assignments are only graded as passed – not passed. The seminar reports and review are graded 3 4 5 and determine the grand grade of the course.

Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

Remarks

Compulsory attendance of the first scheduled lesson/lecture.

Language: English

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Lab exercises and assignments	U G#	4	Mandatory	A14	
0002	Seminars	G U 3 4 5	3.5	Mandatory	A14	

Last revised

by Assistant Director of Undergraduate Studies Eva Gunneriusson, Department of Civil, Environmental and Natural Resources Engineering 2023-06-02

Syllabus established

by Eva Gunneriusson 2014-02-04