

SYLLABUS

Geometallurgy 7.5 credits

U7001K

Geometallurgi

Course syllabus admitted: Spring 2022 Sp 3 - Autumn 2023 Sp 2

DECISION DATE
2022-04-19

Geometallurgy 7.5 credits U7001K

Geometallurgi

Second cycle, U7001K

Education level
Second cycle

Grade scale
U G#

Subject
Kemiteknik

Subject group (SCB)
Chemical Engineering

Entry requirements

Bachelor's degree or equivalent knowledge from practical experience (min. 5 years work experience) in process engineering or geology / mineralogy.
English 6.

Selection

Examiner

Jan Rosenkranz

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 LKAB: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 rocks: origin, formation and metamorphosis, ore geology for LKAB's ores and other types of iron ore;

Process mineralogy:

characterization of ore mineral and metallurgical products (composition, mineral textures, exposure) based on optical microscopy, electron microscopy in combination with quantitative analysis (Quemscan), XRD;

Mineral technology:

basic principles for LKAB's unit operations; equipment selection, link to process mineralogy, mineral engineering test work;

Metallurgy:

basic principles of iron production, product properties, customer requirements and quality; Geometallurgical modeling: geostatistical, process modeling in mineral engineering 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.

The course's language of instruction and form of instruction are stated for each course occasion and appear on the course page on Luleå University of Technology's website.

The teaching consists of lectures, seminars, practical exercises and study visits (LKAB's laboratory work). Participation is mandatory in all parts except in the lectures.

The lectures will give students the opportunity to describe and explain the theory and connections between mineralogy in different ores and enrichment processes.

Practical exercises in geology, process mineralogy and mineral technology are performed in groups. Study visits shall give the opportunity for students to be able to account for advanced mineralogical investigations and technical test methods.

Seminars are devoted to group description, analysis, interpretation and presentation of a complex theme in the field of geometallurgical.

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.

Literature. Valid from Spring 2022 Sp 3

Teaching material is a compendium from the Division of Minerals and Metallurgical Engineering

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Assignment report	U G#	7.5	Mandatory	S22	

Syllabus established

by Assistant Director of Undergraduate Studies Eva Gunneriusson, Department of Civil, Environmental and Natural Resources Engineering 2022-04-19