

SYLLABUS

Simulation of Mineral Processing 7.5 credits M7001K

Simulering av mineraltekniska processer

Course syllabus admitted: Autumn 2023 Sp 1 - Present

**DECISION DATE
2022-06-09**

Simulation of Mineral Processing 7.5 credits M7001K

Simulering av mineraltekniska processer

Second cycle, M7001K

Education level
Second cycle

Grade scale
G U 3 4 5

Subject
Mineralteknik

Subject group (SCB)
Chemical Engineering

Main field of study

Chemical Engineering, Geosciences

Entry requirements

90 credits in Chemical Engineering, including the course M0001K Mechanical Process Technology.

Selection

The selection is based on 30-285 credits

Course Aim

The course provides the possibility to acquire the knowledge to conduct simpler computer-assisted simulations of processes for particulate media. After completion the student should be able to:

- Identify situations when simulation techniques might provide a contribution to the understanding of the process,
- Establish the required input data for simulation of mineral processes,
- Construct and confine flowsheets for simulations,
- Report results from simulations,
- Judge if the simulation results are relevant,
- Interpret the result in process technology terms,
- Formulate hypothesis on changes to the process as a result of the simulation.

Contents

Dry processes

- * Models for comminution of hard, crystalline materials
- * Models for screening
- * Simulation of crusher circuit

Wet comminution

- * Models for comminution in mills with manufactured or autogenous grinding bodies
- * Classification models
- * Simulation of grinding circuit

Separation by density

- * Models for density separation with manufactured or autogenous media
- * Simulation of wet gravity circuit

Separation by surface properties (flotation)

- * Simple and advanced models for flotation
- * Simulation of flotation circuit

Separation processes based on other physical characteristics

- * Simple models for magnetic separation
- * Models for thickeners and filters
- * Simulation of soil remediation plant

Realization

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

The entire course is conducted with IT support (LMS and/or static Web-pages) and a text book with attached simulation program. There is only one compulsory gathering in Luleå. The instruction consists of introductory lectures/reading notes, quizzes, exercises and assignments, all of them delivered by the LMS. The reading notes aim to, for each part of the course, to get across the material in the text book with references to the program and to provide the possibility for the students to describe model structures and explain theoretical concepts. The quizzes are used to give the students a possibility to test their factual knowledge. The exercises are used to train the use of models and to introduce process technology concepts. The assignments are solved in groups with the help of the text book and its simulation program. They aim to train the students to work in groups to formulate the requirements for, conduct, evaluate, interpret, and report simulation results.

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. Control of acquired skill levels with quizzes and graded assignments for each part. These have to be submitted on time, or there will be an automatic deduction of attainable points for the part. The total points production determines the grand grade of the course, and it is given on the scale 3 4 5. For grade 3, the student must be able to list and produce input data, conduct a simulation and show the results. For grade 4, the student must be able to evaluate whether the result is relevant, to interpret it in process technology terms and report the results. For grade 5, the student must be able to formulate and motivate suggestions for change to processes and to report and present the results.

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 at the first gathering.

Overlap

The course M7001K is equal to KGM005

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Assignment Reports	G U 3 4 5	7.5	Mandatory	A07	

Last revised

by Assistant Director of Undergraduate Studies Eva Gunneriusson, Department of Civil, Environmental and Natural Resources Engineering 2022-06-09

Syllabus established

Course plan approved by the Department of Chemical Engineering and Geosciences 2007-02-28.