SYLLABUS

Process Metallurgy 15 credits P7010K

Processmetallurgi

Course syllabus admitted: Autumn 2023 Sp 1 - Present

DECISION DATE
2023-02-13

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LULEÅ TEKNISKA UNIVERSITET

Process Metallurgy 15 credits P7010K

Processmetallurgi

Second cycle, P7010K

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Processmetallurgi	Chemical Engineering

Main field of study

Chemical Engineering

Entry requirements

90 credits in Chemical Engineering. Basic knowledge in metallurgical unit processes, slag chemistry, thermodynamics, hydrometallurgy, phase diagrams and methods for characterization of solid inorganic substances.

Selection

The selection is based on 30-285 credits

Course Aim

The course will give fundamental knowledge in iron and steelmaking processes, extraction of non-ferrous metals, materials and energy flows. The course also gives knowledge on the handling of by-products and recirculation on an advanced level. The course includes a large part dealing with casting of metals, and especially modern casting methods with examples from casting of steel. The student shall also demonstrate an ability to independently carry out a limited research assignment using available experimental tools to carry out experiments, to characterize materials or through thermodynamic modelling. After completing the course, the student shall be able to:

- Describe and explain processes and reactors for extraction and manufacturing of metals and alloys.
- Explain processes based on an advanced thermodynamic perspective. Describe and explain material and energy flows related to extraction of metals and alloys.
- Describe and explain casting of metals, especially modern casting methods with examples from casting of steel.
- Plan and carry out experimental work related to metallurgical processes.
- Present results and evaluation of experimental work in oral and written presentations.

Contents

The course includes methods for and reactors used in iron and steelmaking, non-ferrous metallurgy, casting, handling and use of metallurgical by-products, project task, laboratory experiments and study trips to metallurgical industry.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
The teaching includes lectures, laboratory experiments, study trip and project task. Participation in laboratory experiments, project task and study trip are compulsory. Lectures gives the students possibilities to understand, describe and compare metallurgical processes for iron and steel manufacturing, extraction of non-ferrous metals and understand and describe casting of metals. In connection with laboratory experiments and project task the students are trained in planning, carry out and evaluate practical experiments and in oral and written presentations, present the work and results. The study trip gives the students insight and a feeling for full scale processes.

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. Approved results for laboratory exercise and project task including oral and written presentation and a public discussion of the work of others. For laboratory exercise the marks not approved or approved are given. For project task the grades U, 3, 4, 5 are given. Study trips are compulsory. The theoretical knowledge is controlled with a written and oral exam in which the grades U, 3, 4 or 5 are given. The examination is divided to three occasions, part 1; Iron and steelmaking, written exam. Part 2; casting, written assignments. Part 3: nonferrous metallurgy, assignments and oral exam. Students who have failed an examination on five occasions will not be allowed further examination.

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.

Overlap

The course P7010K is equal to P7001K, P7002K

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0005	Project work	G U 3 4 5	4.5	Mandatory	A13	
0006	Written exam 1 (iron and steel)	G U 3 4 5	3.5	Mandatory	A14	
0008	Required assignment	U G#	2.5	Mandatory	A14	
0010	Oral exam and Assignment report 3 (nonferrous)	G U 3 4 5	3	Mandatory	A16	
0011	Assignments (casting)	U G#	1.5	Mandatory	A16	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Assistant Director of Undergraduate Studies Eva Gunneriusson, Department of Civil, Environmental and Natural Resources Engineering 2023-02-13

Syllabus established

by Eva Gunneriusson 2013-01-16