SYLLABUS

Snow and Ice Mechanics 7.5 credits F7052T

Snö och ismekanik

Course syllabus admitted: Autumn 2023 Sp 1 - Present

DECISION DATE
2022-06-17

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LULEÅ TEKNISKA UNIVERSITET

Snow and Ice Mechanics 7.5 credits F7052T

Snö och ismekanik

Second cycle, F7052T

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	U G VG	Experimentell mekanik	Engineering Physics

Entry requirements

Knowledge of experimental methodology, forces and torque, thermodynamics, dimensional analysis, for example F0004T Physics 1, or equivalent and solution of equations, derivation, analysis of functions, linear equation systems and elementary programming for example M0047M Differential Calculus and M0048M Linear Algebra and Calculus or equivalent. Good knowledge in English equivalent to English 6.

Selection

The selection is based on 30-285 credits

Course Aim

The overall goal of the course is to give the students an understanding on how snow and ice are formed and how snow and ice affect and are affected by their environment and our climate.

1. Knowledge and understanding

- After the course, the student should be able to explain how snow is formed and transformed and how the transformation affects the material properties of snow. The student shall explain the main parameters influencing the snow.
- The student should understand the differences between natural snow and manufactured snow.
- Understand how the properties of snow can be measured and the importance of how these properties are connect to activities on snow and how the large masses of snow and ice on the earth affect the climate.
- Understand the basics of ice formation, ice growth and ice physics as well as knowledge of different types of ice.
- Understand the risks with transports on snow and ice.

2. Skills and ability

- Describe how snow and ice are formed.
- Classify different types of snow.
- Apply snow and ice knowledge by planning and performing experiments to analyze snow and ice.
- Apply snow and ice knowledge by planning and performing experiments that contain snow and / or ice and performing them with repeatability.

3. Judgment and attitude

- Show independent thinking and critical examination of results.
- Reflect upon how different parameters affect work with snow.
- Be able to make own assessments of how the climate is affected by the snow and ice masses on our planet.

Contents

Snow and ice are important raw materials of great importance to companies and actors in the winter industry. Snow and ice also have a major impact on the earth's climate.

The course contains:

- An introduction to the formation of snow
- Snow metamorphism
- Classification of snow
- The basics of ice knowledge
- Physical and mechanical properties of snow and ice
- Impact of snow and glaciers on the climate
- Icephysics
- Snow and ice on other planets
- Periglacial landforms and processes
- Measurement technology for snow and ice

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
Lectures, laboratory work and a compulsory field exercise to which there is an additional fee that includes travel, accommodation, and meals.

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.
The course is examined through oral presentations and submission of reports for project work and individual work.

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.

Course offered by

Department of Engineering Sciences and Mathematics

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Individual assignment report	U G VG	2.5	Mandatory	S23	
0002	Project work	U G VG	3	Mandatory	S23	
0003	Laboratory work/Field work	U G#	2	Mandatory	S23	

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 Niklas Lehto, huvudansvarig utbildningsledare 2022-06-17

Syllabus established

by Niklas Lehto, huvudansvarig utbildningsledare 2022-06-17