

SYLLABUS

Concrete Manufacturing and Construction 7.5 credits K7009B

Betongteknik - Tillverkning och arbetsutförande

Course syllabus admitted: Autumn 2023 Sp 1 - Present

**DECISION DATE
2022-06-15**

Concrete Manufacturing and Construction 7.5 credits K7009B

Betongteknik - Tillverkning och arbetsutförande

Second cycle, K7009B

| Education level | Grade scale | Subject | Subject group (SCB) |
|-----------------|-------------|------------------------|---------------------|
| Second cycle | G U 3 4 5 | Väg- och vattenbyggnad | Civil Engineering |

Entry requirements

K0002B Building materials or equivalent course. Good knowledge in English, equivalent to English B/6.

Selection

The selection is based on 30-285 credits

Course Aim

After completing the course participants should be able to:

Knowledge and understanding

1. Explain the general knowledge about cementitious binders
2. Explain the general knowledge about concrete
3. Explain the general knowledge about ecological/sustainable concretes
4. Explain the general knowledge about application technology used in production of concrete material and concrete structures/elements

Competence and skills

1. Indicate/recommend technological solutions for manufacturing/production of concrete elements/structures
2. Design concrete mix composition and perform basic laboratory testing
3. Choose concrete mix designs, concrete types, cementitious binder combinations in relation to the type of the structure/element in question, expected environmental exposure and the design life span according to European and Swedish regulations
4. Identify possible deterioration processes, propose mitigation approaches, and repair methods (for existing structures)
5. Predict possible human health and safety risks for construction workers and proposed methods to mitigate these

Judgement and approach

1. Critically assess pros and cons of available technological solutions in concrete technology, indicate the most suitable solutions and justify the recommended choice

Contents

History of concrete. Basics of cement chemistry. Concrete mix design. Properties of fresh and hardened concrete. Types of concrete. Ecological-sustainable concrete. Manufacturing, execution and testing of concrete. Precast concrete. Concrete works on building site. Concrete reinforcement. Formwork for concrete. Concrete works in extreme conditions (cold/freezing, hot weather). Concrete durability.

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 consists of online lectures, which are supported by self-study, project work and laboratory exercise. The project work and laboratory exercise are performed as a group tasks. Laboratory work is performed on site in the LTU concrete laboratory. The online lectures will provide students with general knowledge and more specific knowledge, according to all the intended learning outcomes, required for the project work and laboratory exercise. The aim of the project work it so provide training in concrete mix design according to the current regulations as well as theoretical practice in proposing optimum production technology for concrete structures or concrete elements. The aim of the laboratory exercise is to enable students to produce and test simple concrete mixes.

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. Written examination (U, 3.4 5) will assess based on the online examination and will include the general knowledge from online lectures, thus addressing all the intended learning outcomes. Project work and laboratory exercise will be assessed based on the prepared reports and on the output of online discussion (defense) with the examiner. The online-lectures, project work and laboratory exercises are compulsory.

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 Civil, Environmental and Natural Resources Engineering

Modules

| Code | Description | Grade scale | Cr | Status | From period | Title |
|------|-----------------|-------------|-----|-----------|-------------|-------|
| 0001 | Written exam | G U 3 4 5 | 3.5 | Mandatory | A16 | |
| 0002 | Project work | U G# | 3 | Mandatory | A16 | |
| 0003 | Laboratory work | U G# | 1 | 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 2022-06-15

Syllabus established

by Eva Gunneriusson 2016-02-10