

SYLLABUS

Environmentally-Efficient Construction 7.5 credits W7008B

Miljöeffektivt byggande

Course syllabus admitted: Spring 2024 Sp 3 - Present

**DECISION DATE
2023-06-02**

Environmentally-Efficient Construction 7.5 credits W7008B

Miljöeffektivt byggande

Second cycle, W7008B

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Byggproduktion	Building Technology

Entry requirements

- Basic knowledge in sustainable development of the built environment corresponding to, for example, the course V0015B Sustainable building
- Basic knowledge in investment calculation och sustainability work in companies corresponding to, for example, the course G0010N Industrial management with a sustainability perspective

Selection

The selection is based on 30-285 credits

Course Aim

The purpose is for you to develop an understanding of the environmental impact during a building's life cycle and thereby be able to analyse and assess buildings' environmental efficiency in a life-cycle perspective.

Knowledge and understanding

After completing the course, the student should be able to:

- identify and describe energy and material flows generated during a building's life cycle
- identify and describe how the environmental impact and costs over a building's life cycle can be affected by different system designs and technical properties of a building
- explain basic concepts related to life cycle analysis (LCA), life cycle cost analysis (LCC) and environmental certification
- explain what LCA, LCC and environmental certification mean in terms of method and application for buildings

Competence and skills

After completing the course, the student should be able to:

- apply some common tools to perform building-related LCA, LCC and environmental certifications
- together with others, perform, present and interpret integrated analyses of relevance to a building's environmental efficiency
- reflect on the complexity of the analyses, uncertainties and which factors have a major impact on the result

Judgement and approach

After completing the course, the student should be able to:

- reflect on environmentally-efficient measures for house building from an economic, ecological and social sustainability perspective

Contents

Basic factors for environmentally efficient construction, such as energy-related solutions, choice of building materials, etc., as well as life-cycle perspectives on house building. Methods and tools for analysing and assessing the environmental impact and costs of buildings in a life-cycle perspective. Application of methods and tools to develop a basis for client decisions regarding measures for more environmentally-efficient construction.

Realization

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

During the first part of the course, you are expected to conduct self-study with the support of course literature, lectures and exercises that are concentrated on theory and method for LCA, LCC and environmental certification of buildings. During the second part of the course, you carry out a group project task where you practice your skills in the engineering application of these theories and methods. As support in the work on the project task, guidance from teachers and feedback from student colleagues are offered.

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. Three examining modules are included in the course: test, assignment reports and project task.

Test examines knowledge and understanding of basic concepts and what LCA, LCC and environmental certification mean in terms of method and application for buildings. The test is a written individual test. The student is given two opportunities to achieve an approved result on the test during the course and thereafter twice a year in connection with the course being given.

Assignment reports examine knowledge and understanding of energy and material flows during a building's life cycle, how environmental impact and costs over a building's life cycle can be affected by different system designs and technical properties, as well as competence and skills to apply common tools to perform building related LCA and LCC. The assignment reports are examined through active participation in exercises and written individual assignments, where both partial examinations must be approved for a passing grade on the module. The student is given two opportunities to achieve an approved result on the assignment reports during the course and thereafter twice a year in connection with the course being given.

Project task examines knowledge and understanding of energy and material flows during a building's life cycle and how environmental impact and costs over a building's life cycle can be affected by different system designs and technical properties. In addition, the project task examines learning objectives about competence and skills as well as judgment and approach. The project task is examined continuously during the course through written individual opposition and active participation in an oral seminar, as well as the final submission of the group's written report which is individually examined through an oral examination. The student is given two opportunities to achieve an approved result on the opposition and seminar during the course and thereafter twice a year in connection with the course being given. For individual examination of the group's written report, two re-examination opportunities are offered per year, one in connection with the course being given and one in a re-examination period. The grade (U,3,4,5) is based on an assessment of all written and oral examination assignments included in the project work in relation to the grading criteria of the course.

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

The course is included as a compulsory course in the Building Design specialisation of the Master of Science Programme in Architectural Engineering and in the Lean Construction specialisation of the Master of Science Programme in Civil Engineering.

More detailed information about content, implementation and examination is presented in the course study guide which is distributed to course participants in connection with the start of the course.

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Test	U G#	1.5	Mandatory	A16	
0003	Assignment reports	U G#	1	Mandatory	A22	
0004	Project work	G U 3 4 5	5	Mandatory	A22	

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

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Syllabus established

by Eva Gunneriusson 2016-01-19