**DALARNA UNIVERSITY**

# Course Syllabus

## Energy-Efficient Buildings 7.5 Credits*, Second Cycle Level 1

### Learning Outcomes

In order to design energy-efficient buildings with high levels of comfort and durability, sound knowledge of the detailed principles and an overall understanding of building physics are required. The overall aim of this course is to teach students the fundamental principles and design practices in terms of physical processes and information management in construction.

Upon completion of the course, students shall be able to:

- develop models and solve problems for steady and transient heat and moisture transfer in buildings
- evaluate theoretical models and calculation results of heat and moisture transfer in buildings
- assess the thermal performance of glazing, shading and innovative building materials
- develop creative and innovative envelope solutions for energy-efficient buildings

### Course Content

The course covers four topics. The first topic is fundamental heat transfer in buildings and in building components, thermal bridges, as well as heat transfer in steady and non-steady conditions. The second topic covers fundamental moisture transport in buildings and in building components, air tightness and moisture control. The third topic discusses solar glazing/shading, addressing the properties of glazing and other transparent multi-layer systems, and the use of shading structures and devices. Innovative building materials/envelopes is the last topic.

### Assessment

Written examination 7.5 credits

### Forms of Study

Lectures, tutorials, seminars.

### Grades

The Swedish grades U, 3, 4, 5.

* 1 Credit = 1 ECTS

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**Prerequisites**
Bachelor of Science degree in engineering (mechanical, electrical, energy, engineering physics) of at least 180 credits and English 6

**Other Information**

**Subject:**
Construction

**Group of Subjects:**
Building Technology

**Disciplinary Domain:**
Technology, 100%

**This course can be included in the following main field(s) of study:**
1. Civil Planning and Construction

**Progression Indicator within (each) main field of study:**
1. A1N

**Approved:**
Approved 27 April 2017
Valid from 18 July 2017