

## Course Syllabus

### **Solar Radiation and Solar Geometry 5.0 Credits\*, Second Cycle Level 1**

#### **Learning Outcomes**

After the course, the student shall be able to

- demonstrate knowledge of the characteristics of solar radiation before and after passage in the atmosphere.
- review different ways to measure solar radiation and identify the limitations of different measurement methods.
- control the basic geometry and concepts concerning solar motion and be able to calculate the effect of orientation of a surface on the incident solar energy.
- apply calculation models and different instruments for analysing, and indicate how shading from nearby buildings and other objects affect solar irradiation on a given place.
- illustrate and reflect on how human's need of daylight is dealt with in different countries and different kinds of buildings, based on the demand that can be put on daylight design in buildings.

#### **Course Content**

The course treats the physics of solar radiation, solar geometry, the way solar radiation is distributed over time and space, the different ways to measure solar radiation, solar radiation data and different models to calculate solar radiation on surfaces. Methods like sun path diagrams and instruments like the horizontoscope are used for calculating the amount of available solar radiation are discussed and used in laboratory work. A special application treated is daylight and the way in which buildings and their windows affect daylight in different types of buildings.

#### **Assessment**

Written exam 2.5 credits, a reflection report on the lectures about daylight 0.5 credits, written reports from laboratory work, and a written and oral presentation of project work 2 credits.

#### **Forms of Study**

Lectures, seminars, laboratory work and reflection report.

**Grades**

The Swedish grades U, 3, 4, 5.

Reflection report, written report and project (U-G).

The credit will be decided after considering the result from the written exam.

**Prerequisites**

B.A. in engineering (mechanical, electrical, energy, physical sciences, construction engineering, architecture) of at least 180 credits and English 6

**Other Information**

Maximum five examination attempts.

**Subject:**

Energy Technology

**Group of Subjects:**

Energy Technology

**Disciplinary Domain:**

Technology, 100%

**This course can be included in the following main field(s) of study:**

1. Energy Technology
2. Solar Energy Engineering

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

1. A1N
2. A1N

**Approved:**

Approved 27 August 2015

Valid from 21 November 2015