



## COURSE SYLLABUS

# Sustainability, Analyses and Simulations, 7.5 credits

*Hållbarhet, analyser och simuleringar, 7,5 högskolepoäng*

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<b>Course Code:</b> THAR27	<b>Education Cycle:</b> Second-cycle level
<b>Confirmed by:</b> Dean Feb 1, 2017	<b>Disciplinary domain:</b> Technology (95%) and social sciences (5%)
<b>Valid From:</b> Aug 1, 2017	<b>Subject group:</b> BY1
<b>Version:</b> 1	<b>Specialised in:</b> A1N
<b>Reg number:</b> JTH 2017/1896-313	<b>Main field of study:</b> Product Development

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### Intended Learning Outcomes (ILO)

After a successful course, the student shall

Knowledge and understanding

- show familiarity with the concept of sustainability within the field of Construction Engineering
- display knowledge of the most common systems and methods of assessing sustainability within the field of Construction Engineering

Skills and abilities

- demonstrate the ability to design a BIM model in such a way that it can be used to perform sustainability analyses and simulations
- demonstrate the ability to use common BIM based tools to perform sustainability analyses and simulations

Judgement and approach

- demonstrate the ability to identify, analyse, simulate and evaluate vital building performance criterias from a sustainability aspect

### Contents

Within architecture and construction, the product development phase is today completely digital. Strong BIM based tools make it possible to construct a virtual model of the intended project. This model can then be used for analyses, simulations and assessment of performance criterias. Building clients are becoming increasingly aware of the importance of sustainability within the built environment. There are a number of sustainability assessment systems used in different parts of the world, such as LEED (from the US), BREEAM (from UK) and DGNB (from Germany), that can be used to assess and control the sustainability qualities and performance in a project, such as choice of materials, indoor climate quality, energy performance, and daylight conditions. These systems are often used early in the product development process to formulate client demands.

Having completed this course, the student will have an understanding of the concept of

sustainability, knowledge about sustainability assessment systems, and skills to build BIM models and perform analyses and simulations to assess sustainable project performance qualities.

The course includes the following elements:

- The concept of Sustainability within the field of Construction Engineering
- Sustainability assessment systems
- BIM based sustainability assessment tools
- Design Authoring

### **Type of instruction**

Lectures, exercises and project work. A limited number of guest lectures in Swedish can occur.

The teaching is conducted in English.

### **Prerequisites**

The applicant must hold the minimum of a bachelor's degree (i.e the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits in construction engineering or civil engineering, or equivalent. The bachelor's degree should comprise a minimum of 15 credits in mathematics. Proof of English proficiency is required.

### **Examination and grades**

The course is graded 5,4,3 or Fail.

The final grade for the course is based upon a balanced set of assessments.

The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

<b>Name of the Test</b>	<b>Value</b>	<b>Grading</b>
Written Exam	3.5 credits	5/4/3/U
Assignments/Project work	4 credits	5/4/3/U

### **Course literature**

The literature list for the course will be provided one month before the course starts.