COURSE SYLLABUS

Energy and Building Services Engineering, 6 credits

Energi och installationsteknik, 6 högskolepoäng

Course Code:	TEIN15	Education Cycle:	First-cycle level
Confirmed by:	Dean Feb 9, 2015	Disciplinary domain:	Technology (95%) and social sciences (5%)
Valid From:	Aug 1, 2015	Subject group:	BY1
Version:	1	Specialised in:	G2F
Reg number:	JTH 2015/765-313	Main field of study:	Civil Engineering

Intended Learning Outcomes (ILO)

On completion of the course, the student should

Knowledge and understanding

-Demonstrate knowledge about the building as an energy system and how it can be controlled to support a sustainable development.
-Demonstrate knowledge and understanding of the energy balance of the building.
-Demonstrate knowledge about different types of technical systems (electricity, heat, ventilation and sanitation) in buildings.

Skills and abilities

-Demonstrate the ability to calculate and design the building envelope and services according to standard requirements and criteria for low-energy buildings.

Judgement and approach

-Show ability to evaluate the building with its energy and technical installation systems from a sustainable development perspective, including ecological, social and economic aspects.

Contents

A survey course about different building services and how these in interaction with the building envelope affect the energy balance of the building.
Course contents:
-Thermal physics and its technical requirements and standards required in the structures of the building envelope
-Environmental certification of buildings
-Low-energy buildings
-Electrical engineering with electrical services, electrical safety, artificial lightning and provisional electricity during construction
-Air treatment with, ventilation needs, air quality, different ventilation systems, heat recovery and ventilation efficiency
-Heating with heating technology, various heating systems and heat pumps.
-Heat production and heat sources.

-Thermal indoor climate and thermal comfort
-Space requirements for technical systems in buildings connected to technology and work environment
-Sanitation engineering with technical systems for drinking water, wastewater and stormwater
-Renewable energy
-Solar cells and solar heat
-Energy balance of the building
-Technical drawings with symbols and designations for plumbing and electrical systems
-Regulations and regulatory requirements

Type of instruction

Lectures and exercises.

The teaching is conducted in English.

Prerequisites

General entry requirements and completed Courses 60 credits in first level including the courses BIM Project 2, Analysis and Simulation - Architectural Engineering, 12 credits or BIM Project 2, Analysis and Simulation - Construction Engineering, 12 credits (or the equivalent).

Examination and grades

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

Registration of examination:

Name of the Test	Value	Grading
Examination[1]	4 credits	5/4/3/U
Project work	2 credits	U/G

[1] Determines the final grade of the course, which is issued only when all course units have been passed.

Course literature

The literature is preliminary until one month before the course starts.

Titel:Building Services Design for Energy Efficient Buildings
Författare: Tymkow, P. Tassou, S. Koloktroni, M & Jouhara, H. (2013)
Förlag: London: Routledge
ISBN: 9780415596374