Linnæus University

Course syllabus

Faculty Board of Science and Engineering
School of Engineering

2BY001 Energi- och klimateffektivt byggande, 7,5 högskolepoäng
Energy- and climate-efficient construction, 7.5 credits

Main field of study
Civil Engineering

Subject Group
Building Technology

Level of classification
First Level

Progression
G2F

Date of Ratification
Approved by the Board of the School of Engineering 2011-11-28

The course syllabus is valid from autumn semester 2012

Prerequisites
English course B and completed at least 60 hec in the major Building Technology subject or the equivalent.

Objectives
On completion of the course the students should possess the ability to:

- Understand, interpret, and describe concepts relevant for energy and material flow analysis.
- Understand and apply methods for energy and material flow analysis.
- Give an overview of energy systems for heat and electricity in the built environment.

Content
The course provides knowledge on energy- and material flow in the built environment. Energy analysis aspects include energy use in life cycle of a building, and various fossil fuel- and biomass-based energy supply systems. Material flow aspects cover mainly the environmental implications of producing buildings with various framing materials (e.g. wood, concrete, metals).

Type of Instruction
The teaching consists of lectures, seminars, exercises, and project work. Some parts are compulsory for students to participate.

Examination
The course is assessed with the grades U, 3, 4 or 5

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On request, students may have their credits translated to ECTS marks.
Such a request must be sent to the examiner before the grading process starts.

The assessment of student performances normally takes place during special examination periods and can be written and/or oral. The assessment may also be based on submitted assignments. For students who do not pass the regular examination, a re-examination is arranged, as a rule under special re-examination periods.

Course Evaluation

A written course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The course evaluation will be filed at the department.

Required Reading and Additional Study Material

Required reading

Kornelius, B., 2007. Introduction to Energy Analysis, Amsterdam, Techne Press, 256p.

Gustavsson, L. and Joelsson, A., 2007. Conversion of electric heating systems in detached houses subjected to energy conservation, Energy and Buildings, 39(6): 716-726.

Gustavsson, L. and Karlsson, Å., 2002. A system perspective on the heating of detached houses, Energy Policy 30(7): 553-574.

Dodoo A., Gustavsson L. and Sathre R., 2010. Life cycle primary energy implication of retrofitting a wood-framed apartment building to passive house standard, Resources, Conservation and Recycling, 54(12): 1152-1160.

Gustavsson L., Joelsson A. and Sathre R., 2010. Life cycle primary energy use and carbon emission of an eight-story wood-framed apartment building, Energy and Buildings, 42(2): 230–242.

Gustavsson L. and Sathre R., 2006. Variability in energy and carbon dioxide balances of wood and concrete building materials, Building and Environment, 41(7): 940-951.

Schlamadinger, B., Apps, M.J., Bohlin, F., Gustavsson, L., Jungmeier, G., Marland, G., Pingoud, K., and Savolainen, I., 1997. Towards a standard methodology for greenhouse gas balances of bio-energy systems in comparison with fossil energy systems, Biomass & Bioenergy, 13: 359-375.

Thormark, C., 2002. A low energy building in a life cycle- its embodied energy, energy need for operation and recycling potential, Building and Environment, 37 (4): 429-435.

The literature list is supplemented with recent articles and other relevant material.