



Course Syllabus:

Environmental Engineering MA, Energy and Material Flows in the built environment, 7.5 Credits

General data

Code	MÖ004A
Subject/Main field	Environmental Engineering
Cycle	Second cycle
Credits	7.50
Progressive specialisation	Second cycle, has only first-cycle course/s as entry requirements
Answerable department	Faculty of Science, Technology and Media
Established	2007-12-14
Date of change	2015-03-04
Version valid from	2013-08-15

Entry requirements

Degree of Bachelor of at least 180 Credits (180 ECTS) or equivalent, with at least 45 Credits (45 ECTS) in Environmental Science or Environmental Technology/Engineering.

Proven language proficiency in English (English course B), for example shown from one of the following international English tests:

- TOEFL with a minimum score of 575 on a paper based test and not below 4.5 on the TWE
- TOEFL with a minimum score of 90 on internet based test and not below 20 on the TWE
- IELTS Academic Training with a minimum overall score of 6.5 and a minimum score on the specific parts of at least 5.5.

Selection rules and procedures

The selection process is in accordance with the Higher Education Ordinance and the local order of admission.

Grading system

The grades A, B, C, D, E, Fx and F are given on the course. On this scale the grades A through E represent pass levels, whereas Fx and F represent fail levels.

Course reading

Required literature

Björn Berge, *The Ecology of Building Materials*, Oxford, Architectural Press, 2003, 0-7506-5450-3

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

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

Kornelius Blok, *Introduction to Energy analysis.*, Amsterdam, Tecchne Press, 206, 13:978-8594-016-6

Comment: Optional

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

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

Reference literature

Gustavsson, L. and Karlsson Å., Heating detached houses in urban areas. *Energy* 28(8): 851-875., 2003

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

Gustavsson, L. et.al., Reducing CO2 emissions by substituting biomass for fossil fuels. (1995) *Energy* 20(11): 1097-1113.

Litteraturlistan kompletteras med aktuella artiklar och annat relevant material.