



Faculty of Technology and Science
Environmental and Energy Systems

Syllabus

Course Approval

The syllabus was approved by the Faculty Board of Technology and Science on 11 June 2008, and is valid from the Spring semester of 2008 at Karlstad University.

Course Code: EMGB12

**Building Services Engineering, 15 ECTS Credits
(Installationsteknik, 15 Swedish credit points)**

Degree Level: Bachelor

Progression Level: B

Language of Instruction

Swedish

Prerequisites

Environmental and Energy 45 ECTS or equivalent.

Major Field of Study

Environmental and Energy systems.

Learning Outcomes

Upon completion of the course, students should be able to:

- identify the factors that have an effect on and determine the indoor climate of a building. The indoor climate comprises air quality and thermal climate.
- describe and analyze ventilation-, heating-, and cooling systems.
- dimension and evaluate components and balancing principles, as well as regulating principles in order to adapt ventilation-, heating-, and cooling systems to various working conditions.
- estimate the needs for power and energy in order to climatize a building or to provide heating or cooling to an industrial process using heat balances and duration analysis.

Content and Form of Instruction

The course work is done on campus.

Course elements covered include:

- the technical systems for heating and ventilation of residential buildings
- hazardous constructions in building technology in relation to problems of moisture
- analytical models to evaluate new heating systems and heating sources using duration diagrams and energy balances
- calculation methodology in order to estimate the energy- and power requirements of buildings
- calculation methodology in order to analyze a construction's vulnerability to moisture (using a Mollier diagram).

Key concepts covered in the course:

- heat conductivity, moisture diffusion, convection, capillary attraction, dew point, energy, power, relative humidity, vapour concentration, additional insulation, underfloor crawl space, cold attic, natural ventilation, floating floor, drainage, fresh-air inlets, requirements ventilation, night reduction, passive houses, stove, heat-spreading, overpressure, strip foundation, and underfloor heating.

Reading List

See separate document.

Examination

Examination is in the form of oral and written exam, and oral and written presentation of an individual project.

Grades

One of the grades Fail, 3 (Pass), 4 (Some Distinction), or 5 (Distinction) is awarded in the examination of the course.

Quality Assurance

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course assessment is based on student views and experiences as reported in written course evaluations and/or group discussions. Students will be informed of the result of the evaluation and of the measures to be taken.

Course Certificate

A course certificate will be provided upon request.

Additional Information

Students who enrolled before 1 July 2007 will complete their studies in accordance with the requirements of the earlier admission. Upon completion students may request degree and course certificates to be issued under the current ordinance if they meet its requirements.

The local regulations for studies at the Bachelor's and Master's levels at Karlstad University, ref. C2007/368, stipulate the obligations and rights of students and staff.

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