

Course Syllabus

Renewable Power Generation 7.5 Credits*, First Cycle

Learning Outcomes

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

- explain essential concepts and technologies for power generation based on commonly available renewable energy sources (1)
- demonstrate understanding of the relationship between and the properties of processes, media and technical systems (2)
- evaluate the resulting energy and environmental characteristics and suitability for practical application (3)
- analyse, solve and evaluate the results of realistic quantitative problems concerning renewable power generation using scientifically-based mathematical models. (4)
- carry out a well-defined project task related to a part of a system or micro-system for renewable power generation, draw reasonable conclusions from the results obtained and present these in writing with reference to the original problem formulation. (5)

Course Content

The course covers theoretical foundations and technology of plant and auxiliary systems for power generation based on commonly available renewable energy sources, with focus on wind and solar power, and their role in energy systems, primarily for Swedish conditions but also with an international perspective.

Basic principles of physics for power generation from wind, wave, hydro and solar power are covered.

Dynamic power generation technology for mainly hydro, wind and wave power applications is covered, as are project development and conditions for production.

Photovoltaic systems are covered, including the construction of different solar cell types, and operational characteristics as a consequence of the power electronics systems employed as well as generation potential when connected to grids and battery-based storage solutions.

Principles for designing subsystems or microsystems for the supply of electricity to single households, villages, industry or other utilities.

Assessment

- A written exam (3 credits) on wind and solar power (learning outcomes 1 – 4)
- Written assignments on hydro power (1.5 credits) (learning outcomes 1 – 4)
- Project (3 credits) (learning outcome 5).

Forms of Study

Lectures, exercises, and project work.

Grades

The Swedish grades U, 3, 4, 5.

Assignment and laboratory work, U-G-VG

The final grade is based on the student's achievements in all assignments and the exam.

Prerequisites

Electrical Power Engineering 7.5 credits First Cycle Level, Fluid Dynamics, 7.5 credits First Cycle Level and Thermodynamics 7.5 credits First Cycle Level

Other Information

Replaces EG2010.

Subject:

Energy Technology

Group of Subjects:

Energy Technology

Disciplinary Domain:

Technology, 100%

Progression Indicator:

G1F

Approved:

Approved 18 April 2019

Valid from 15 June 2019