



**LUNDS UNIVERSITET**  
Lunds Tekniska Högskola

*Course syllabus*

# **Avancerad hållbar energiteknik** **Advanced Sustainable Energy Engineering**

**MVKP40, 7,5 credits, A (Second Cycle)**

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED M

**Date of Decision:** 2023-04-11

## **General Information**

**Main field:** Sustainable Energy Engineering.

**Compulsory for:** MHET2

**Language of instruction:** The course will be given in English

## **Aim**

This course aims to provide the students with the knowledge to formulate, analyse and report a project on an Energy Technology related subject. To Prepare them for their master thesis work and to achieve skills in applying the knowledge from previous energy related courses on a relevant problem.

## **Learning outcomes**

*Knowledge and understanding*

For a passing grade the student must

- be able to perform advanced analysis of an energy related problem
- be able to explain the important concepts and parameters of the problem
- be able to describe the chosen method of analysis and explain its reliability
- be able to understand when analytical and empirical methods are applicable
- be able to search, find and critically examine engineering/academic reports of relevance for the actual theme

*Competences and skills*

For a passing grade the student must

- be able to present the performed task and the results of the project in written and oral ways
- be able to actively participate in discussions and negotiations concerning the chosen subject
- be able to critically examine other project reports and to defend the critics

### *Judgement and approach*

For a passing grade the student must

- be able to analyse an energy related problem and document the analysis
- be able to judge the reliability of the approach and the assumptions made
- be able to critically evaluate the chosen methods and results of the analyses

## **Contents**

The study course will give knowledge about issues within the chosen theme, specific knowledge within the theme, as well as knowledge and practice in methods for oral and written presentation of engineering results. Methods for defence of a report and methods for doing a correct opposition of the other students' report. Lectures will be given related to research methodology, searching in databases and academic writing.

Suggested Research Areas:

- Efficient Energy Systems: District heating and cooling, Energy and load management in buildings, energy planning
- Combustion Engines: Energy efficient engines, New combustion concepts
- Thermal Power Engineering: Analysis of thermodynamic cycles, Gas and steam turbine technologies, Renewable power and wind turbines
- Fluid Mechanics: Turbulent combustion, Large Eddy Simulation, Multi-phase flow
- Heat Transfer: Numerical and experimental investigations of heat transfer

## **Examination details**

**Grading scale:** TH - (U,3,4,5) - (Fail, Three, Four, Five)

**Assessment:** Students will work in maximum two persons in a group. Assessment will be based on written report (70%), oral presentation (10%), peer-review of the work of another group of students (20%). The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

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## **Admission**

### **Admission requirements:**

- FMIF20 Environmental Issues or MVKN51 Energy Converters for Sustainable Transport or MVKN95 Environmentally Friendly Power Generation or MVKP10 Energy Engineering

**The number of participants is limited to:** No

**The course overlaps following course/s:** MVKN80

## **Reading list**

- Chosen specifically for every project in cooperation with supervisor.

## **Contact and other information**

**Course coordinator:** Narmin Hushmandi, narmin.hushmandi@energy.lth.se

**Examinator:** Martin Andersson, martin.andersson@energy.lth.se

**Examinator:** Magnus Genrup, magnus.genrup@energy.lth.se

**Course homepage:** <https://www.energy.lth.se/english/education/>

**Further information:** The course is based on lectures, exercises in database searching, scientific studies and analysis, essay writing in groups of two (under supervision), review techniques and seminars.