

**SYLLABUS**

# **Sustainable Energy systems 7.5 credits F0040T**

**Hållbara energisystem**

**Course syllabus admitted: Autumn 2024 Sp 1 - Present**

**DECISION DATE  
2024-02-15**

# Sustainable Energy systems 7.5 credits F0040T

## Hållbara energisystem

### First cycle, F0040T

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Energiteknik	Energy Technology

### Main field of study

Energy Engineering

## Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language + Swedish upper secondary school course English 6.

## Selection

The selection is based on final school grades or Swedish Scholastic Aptitude Test.

# Course Aim

## Knowledge and understanding

After completing the course student should demonstrate

- advanced knowledge of main energy system concepts that enables identifying relevant energy data from various sources.
- basic knowledge of main energy resources and use from a global, national and regional perspective, which enables the identification of differences in challenges and opportunities between regions in the transition to a more sustainable society and in reaching the UN Sustainable Development Goals.
- basic knowledge of main energy-related environmental impacts that enables identification of the main environmental challenges in a given energy system.
- basic knowledge on 'levelized cost of energy', which enables a consistent cost comparison between different energy technologies.
- basic knowledge of sustainable development concepts, which makes it possible to point at tradeoffs between ecological, economic, and social development.
- basic knowledge about the role of technologies, behavioural changes, and policies to accelerate the transition to a more sustainable energy system.

## Skill and ability

After completing the course, student should be able to

- identify key data and analyse trends in different energy sectors based on global, national, and regional energy statistics.
- identify and discuss in which ways a given energy system is sustainable or not, with a focus on ecological, economic as well as social equity and equality.
- express themselves on a basic level, orally and in writing, within the area of sustainable energy systems.

## Valuation and attitude

After completing the course, student should be able to

- critically evaluate information on the ongoing energy transition, thus be aware of reliable sources and main concepts within the field.
- work according to good academic practice.

## Contents

Energy is a critical resource in society, but the supply and use of energy also cause environmental and other problems. This course describes the role of the energy system in reaching a more sustainable society. The current global energy situation and the resource and environmental problems it causes are presented and discussed. Further, different pathways and solutions to current issues are discussed, including

- Basic insights into the different sectors and sub-sectors of the energy system, and their respective challenges and opportunities in achieving a more sustainable society.
- The role of energy supply and energy use in reaching UN's sustainable development goals (SDGs).
- Technical, economic, social, and political measures that can contribute to the sustainable energy transition.
- Different scenarios for how the present energy system may 'evolve' in the future under different circumstances.

The course also introduces students to basic energy statistics, technical reports, and scientific literature on energy and sustainability issues, and provides the students opportunity to make energy assessments, practice drafting and writing a scientific report, and orally presenting the findings from a group project.

## Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The course consists of several lectures (including guest lectures), assignments, and a project. The assignments are carried out individually, while the project is carried out in groups and is presented orally as well as in a written report.

## Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. The examination consists of five written assignments, one written project report, and an oral project presentation. The grade is based on points collected from the performance of the assignment and the project work. The final point of the project report and the oral presentation will be based on the participant's overall involvement and contribution to the project (may increase or decrease). Consideration is also taken to the activity during and in connection to the lectures (will only improve grade). Attendance at compulsory activities is required. Oral or written additional task(s) are offered for the students to be able to pass the course, as well as to verify the individual contributions.

## Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

## Overlap

The course F0040T is equal to MTM142

## Course offered by

Department of Engineering Sciences and Mathematics

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0003	Written exam	G U 3 4 5	5	Mandatory	A24	
0004	Project work	G U 3 4 5	2.5	Mandatory	A24	

## Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

## Last revised

by Nils Almqvist, Head of Undergraduate Education 2024-02-15

## Syllabus established

by Department of Applied Physics and Mechanical Engineering 2010-08-07