



# MJ2414 Energy Systems Analysis in an Environmental Context 6.0 credits

Energisystemanalys med exergi-, ekonomi- och miljöperspektiv

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

## Establishment

Course syllabus for MJ2414 valid from Autumn 2019

## Grading scale

A, B, C, D, E, FX, F

## Education cycle

Second cycle

## Main field of study

Mechanical Engineering

## Specific prerequisites

Degree of Bachelor (BSc) or the equivalent. Only for students in SELECT (TMESM) master programme

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

## Intended learning outcomes

After passing the course, the students should be able to:

LM 1 Correctly carry out analyses of energy systems, from the primary energy sources to the energy services

LM 2 Correctly carry out a composite analysis of thermodynamic flows, exergy flows, environmental impact and monetary costs

LM 3 Account for the theory behind composite analyses of thermodynamic flows, exergy flows, environmental impact and monetary costs, and alternative ways to analyse energy systems

LM 4 Correctly carry out an exergy analysis, thermo-economic analysis and pinch analysis for a heat exchange network

## Course contents

Energy system analysis with exergy, economical and environmental perspectives

## Course literature

- Bejan, A., Tsatsaronis, G., Moran, M. 1996. Thermal Design & Optimization. John Wiley & Sons, Inc.

- Or other reference text books of your choice in Engineering Thermodynamics, e.g. (available as e-books):

i) Jalurya Y., Design and Optimization of Thermal Systems, 2nd edition. CRC Press 2007.

ii) Elliot J. R., Lira C. T., Introductory Chemical Engineering Thermodynamics, 2nd edition, 2012.

- Lecture “Handouts” including our commonly collected literature through Homework Assignments.

- Assigned references in class.

## Examination

- INLA - Hand in assignment, 0.5 credits, grading scale: P, F
- INLB - Hand in assignment, 0.5 credits, grading scale: P, F
- TENA - Written examination, 2.5 credits, grading scale: A, B, C, D, E, FX, F
- TENB - Unsupervised exam and oral exam, 2.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

With this change, there are no legacy assessments. However, two new assessment items have been included, namely INL1 and INL2. These assignments have however also existed earlier, but not as assessment items. If students who have not completed the course with previous assessment items have completed INL1 and INL2, they can be assessed based on current grading criteria. If they have not completed INL1 and INL2 this has to be done in written to receive final course grade.

## Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.