



# MF2522 Systems Engineering

## 6.0 credits

### Systemkonstruktion

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

### Establishment

On 15/10/2025, the Director of First and Second Cycle Education of School of ITM has decided to establish this official course syllabus to apply from spring term 2026 (registration number HS-2025-2633).

### Grading scale

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

### Education cycle

Second cycle

### Main field of study

Mechanical Engineering

### Specific prerequisites

A Bachelor of Technology degree in Mechanical Engineering or the equivalent.

### Intended learning outcomes

Upon completion of the course, students should be able to

1. describe and explain the fundamental principles, concepts, processes, methods and applications in system design
2. take a holistic approach to creatively, critically and systematically integrate knowledge from previous subject areas in order to analyse, assess and manage complex systems
3. evaluate models for the planning and design of technical systems
4. in collaboration and dialogue with different groups, construct a technical system with the support of a main model and a given system definition
5. make assessments taking into account relevant scientific and societal aspects when choosing technical solutions
6. clearly explain and discuss their engineering conclusions and the knowledge and arguments on which they are based, both orally and in writing, in dialogue with others

## Course contents

This course offers an introduction to systems engineering, with a particular focus on applications in mechanical engineering. Systems engineering is an interdisciplinary approach that integrates various technical disciplines to ensure that complex systems meet all technical and operational requirements throughout their life cycle. The aim of the course is to equip students with the skills and tools necessary to lead and participate in the development and management of complex systems. The course is project-based and focuses on the analysis and redesign of an existing technical system. Students must apply theoretical knowledge in a more practical, holistic perspective.

The course covers the following:

A stage-gate process and the V-model that supports the project

Product and life cycle management, international standards and support tools

The active environment and environmental impact

Stakeholder and requirements management

System architecture

Integration of systems and components, interfaces between components using design structure matrix-based analysis to identify module candidates

Manufacturing, assembly, service and maintenance aspects

RAMS supported by FTA and FMEA analysis methods

Risk and threat assessment

System verification and validation

## Examination

- PRO1 - Project assignment, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 3.0 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.

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

## Other requirements for final grade

The project tasks to be presented are compulsory.

## 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.