



# FMJ3751 Systems Thinking for Innovation in a Complex World

## 12.0 credits

Systemtänkande för innovation i en komplex värld

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

### Establishment

Course syllabus for FMJ3751 valid from Spring 2018

### Grading scale

G

### Education cycle

Third cycle

### Specific prerequisites

Eligible for third-cycle education.

### Language of instruction

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

### Intended learning outcomes

The purpose of the course is to study and practice systems thinking and modelling for the analysis of complex real world problems, with a focus on the analysis of interrelated system. After finishing the course, the student should be able to:

- describe the main aims of systems thinking, modelling and simulation
- understand and describe soft and hard systems
- use systems thinking to conceive complex systems and find the interrelationships between the variables in a system
- have a comprehensive knowledge of the systems principles (feedback loops, stock, flows, dynamic equilibrium etc.)
- have the ability to understand and deal with complex systems
- be able to design and conduct group model-building projects
- have a deeper knowledge in system dynamics, agent-based modelling and game theory
- understand the mathematical formulation of models
- understand computer modelling and simulation or analytical writing

## Course contents

The course contains i) systems thinking building blocks, ii) deeper understanding in system dynamics, agent-based modelling and game theory, and iii) computer simulation or writing of a report based on research interest. The course consists of seminars, literature reading and modelling or report writing.

## Course literature

Will be announced on the course homepage in advance of the course start.

## Examination

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.

## 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.