



# FSH3100 Advanced Measurement Techniques and Electronics for Physicists 7.5 credits

Avancerad mätteknik och elektronik för fysiker

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 FSH3100 valid from Spring 2019

## Grading scale

P, F

## Education cycle

Third cycle

## Specific prerequisites

Graduate students in physics.

## Language of instruction

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

## Intended learning outcomes

- Define the problem for measuring electrical signal and control of equipment based on input signal.
- Select the appropriate basic solution for the food circuit and detailed the solution for electronics engineers

## Course contents

1. RC circuits and time constant. Handling of oscilloscope and function generator.
2. Transistor amplifier. A single amplifier with certain characteristics must be constructed and its properties measured.
3. Operational Amplifier. A fixed amplifier amplifier shall be built and its frequency range and gain shall be measured.
4. Logic circuits. A bistable rocker with given properties shall be constructed and the properties verified in measurement.
5. Programmable logic circuits. An FPGA should be programmed to given properties that are to be measured and verified.
6. Microprocessor. A microprocessor should be programmed to perform simple control from given input data.

## Disposition

Reporting of project assignments, both written and oral.

## Course literature

Literature is determined by the examiner.

## Examination

- PRO1 - Project work, 4.0 credits, grading scale: P, F
- PRO2 - Project work, 3.5 credits, grading scale: P, 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.

## Other requirements for final grade

Approved grade on PRO1 and PRO2

## 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.