



# EF2264 Operation of Space Systems 6.0 credits

## Drift av rymdsystem

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

The official course syllabus is valid from the autumn semester 2022 in accordance with head of school decision: J-2021-2021. Decision date: 14/10/2021

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Electrical Engineering

## Specific prerequisites

The upper secondary course English B/English 6.

Knowledge in signals and systems, 6 higher education credits, equivalent to completed course EQ1110/SD2125.

Knowledge in classical physics, 7.5 higher education credits, equivalent to completed course SK1108/SK1112.

Knowledge in electric measuring techniques, 6 higher education credits, equivalent to completed course EK1191/MF1017.

## Language of instruction

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

## Intended learning outcomes

On completion of the course, students should be able to

- give an account of physical principles and established methods for communication with space vehicles
- give an account of modulation and encoding of radio links
- use a link budget for design of space systems
- give an account of the structure of a ground station
- analyse preconditions for operation of rymdsystem based on the position of the ground station and the satellite orbits
- give an account of the operations phases of the satellite from lanch to decomissioning
- carry out basic tests of satellite communication systems

## Course contents

- Basics in signal and communication theory
- Modulation/demodulation
- Structure of radio communication systems and their performance
- Practical calculation of satellite orbits
- Link budget and link design
- Function and structure of satellite ground stations
- Operation phases of space systems

Practical items in the course include labs where students use satellilte ground stations to

- receive data from existing satellites in orbit
- decide orbital parameters from observations of satellites
- receive bilddata from satellites.

In addition to this includes labs that include practical testing of RF systems.

## Examination

- LAB1 - Laboratory work, 1.5 credits, grading scale: P, F
- LAB2 - Laboratory work, 1.5 credits, grading scale: P, F
- TEN1 - Oral exam, 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.

## 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.