



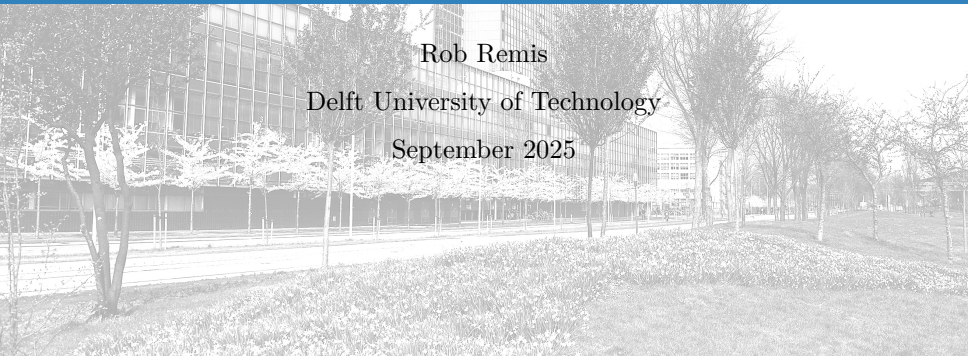
Signals and Systems

EE2S1

Rob Remis

Delft University of Technology

September 2025



① Course details and overview

Welcome to the **Signals and Systems** course!

Course code: EE2S1

Lecturers:

- ▶ Rob F. Remis
Room 18.060
EEMCS building
Email: R.F.Remis@TUDelft.NL

- ▶ Alle-Jan van der Veen
Room 17.040
EEMCS building
Email: A.J.vanderVeen@TUDelft.NL

► Exam:

- 1 Partial exam 1: 29-09-2025
- 2 Partial exam 2: 05-11-2025
- 3 Resit exam: 08-01-2026

For each (partial) exam you are allowed to bring one A4 (2 sides) with *handwritten* notes

► Book:

Signals and Systems Using Matlab

Third edition

Luis F. Chaparro

Aydin Akan

Available as an e-book at the TU Delft library

Lectures part 1

Weeks 1 – 4

► Weeks 1 and 3

- > Monday, 13:45, lecture hall Boole
- > Wednesday, 15:45, lecture hall Boole

► Weeks 2 and 4

- > Monday, 13:45, lecture hall Boole
- > Wednesday, 15:45, lecture hall Boole
- > Friday, 08:45, lecture hall Boole

Course labs

- ▶ Lab sessions in the Tellegen hall after the midterm
- ▶ Lab sessions consist of programming exercises (Python)
- ▶ Each exercise has to be signed off (pass/fail)
- ▶ You need passes on all exercises to pass the course
- ▶ In case you already passed the course labs of EE2S1 then you do not need to do the course labs.
Please contact Alle-Jan van der Veen
- ▶ Details can be found on Brightspace

- ▶ **Course content**

- > Indicated chapter and sections from the book
- > Slides

- ▶ **Note:** Results, methods, and techniques from complex analysis are no longer used in our treatment of the Laplace transform

List of topics

Part 1

- ▶ Standard signals and the Dirac distribution
- ▶ Linear and time-invariant systems (LTI systems)
- ▶ The Laplace transform
- ▶ Fourier series

Part 2

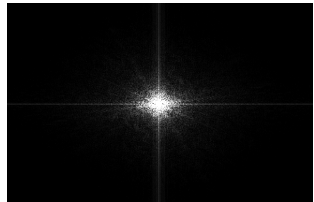
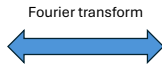
- ▶ The Fourier transform
- ▶ Sampling and reconstruction
- ▶ Discrete time LTI systems
- ▶ The Z-transform
- ▶ The discrete time Fourier transform
- ▶ Analog and digital filter design

- ▶ Linear algebra and analysis
- ▶ Linear circuits
- ▶ Differential equations
- ▶ Complex numbers and Euler's formula

- ▶ Circuit analysis
- ▶ Filter design
- ▶ Stability analyses
- ▶ Signal processing
- ▶ Image processing (image = 2D signal)
- ▶ ...

1 Applications

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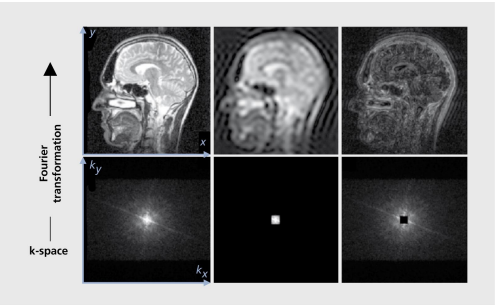


1 Applications

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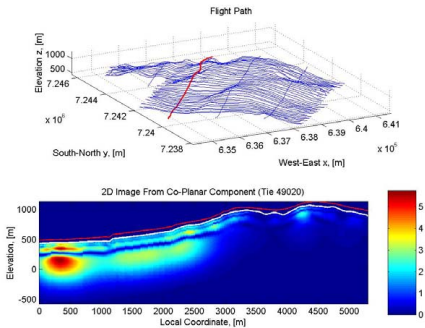
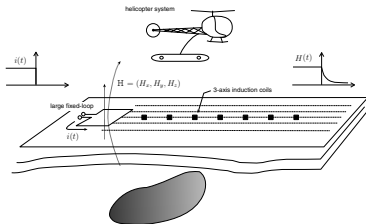


MRI scanner



MR images and their spatial Fourier transform

Imaging in geophysics



Signal processing: How to mount an audio/video or other data signal on some carrier that can easily be transmitted over great distances?

