

# Linear Systems, TSEI50, 2017

<http://www.commsys.isy.liu.se/en/student/kurser/TSEI50>

## Teachers

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## Course material

H. Johansson: *Discrete-Time Systems* (available in Building A).

Problems and solutions for the lessons (can be downloaded)

Laboratory-work material (can be downloaded)

Söderkvist: *Formler & Tabeller* (available in the bookstore in Kårallen). (This is in Swedish, but any corresponding Formulas/Tables compendium will do.)

**Lectures, 24 h (12 occasions). Schedule on the next page.**

**Lessons, 24 h (12 occasions). Schedule on the next page.**

## Laboratory work, 16 h, 4 occasions

Solving problems using MATLAB.

**You need to sign up for the labs at:**

<http://www.commsys.isy.liu.se/en/student/kurser/labbar?action=getCourse&kursKod=TSEI50>

**Note that the laboratory work is mandatory and must be passed in order to pass the whole course!**

## Exam, 4h

Aid for the exam: Mathematical tables/formulas and pocket calculator.

Max 70 points (7 problems), 30 points required to pass.

Optional seminars (oral), two occasions. Active participation gives maximum 10 points (5 + 5) on the written exam, corresponding to Problem 1.

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## Lectures, 24 h

Lecture 1: Chapter 1 – Signals and systems

Lecture 2: Chapter 2 – Sequences, Chapter 3 – Discrete-time systems

Lecture 3: Chapter 3 – Discrete-time systems

Lecture 4: Chapter 3 – Discrete-time systems

Lecture 5: Chapter 4 – Fourier series and Fourier transform

Lecture 6: Chapter 5 – z-transform, Chapter 6 – frequency response and transfer function

Lecture 7: Chapter 6 – Frequency response and transfer function

Lecture 8: Chapter 7 – Sampling and reconstruction

Lecture 9: Chapter 8 – Discrete Fourier transform

Lecture 10: Chapter 9, 10, 11 – Stochastic processes

Lecture 11: Chapter 12 – Interpolation and decimation

Lecture 12: Summary

## Lessons, 24 h

The problems on the first lines are for the lessons whereas those on the second lines are recommended as extra exercises.

- Lesson 1: 2.1, 2.2a-c, 2.4a,b, 2.5a,b, 2.6a,c  
1.1–1.6, 2.2d,e, 2.3, 2.4c,d, 2.5,c,d, 2.6b,d
- Lesson 2: 2.7, 2.8b, 3.1a-c, 3.2a,b  
2.8a, 3.1d-f, 3.2c,d
- Lesson 3: 3.3a,b, 3.4a,b, 3.5a,c,d, 3.6  
3.3c,d, 3.4c, 3.5b,e,f, 3.7
- Lesson 4: 3.8, 3.11, 3.14  
3.9, 3.12, 3.15
- Lesson 5: 4.1a,c, 4.2a, 4.3a, 4.4a,b, 4.5, 4.6  
4.1b, 4.2b, 4.3b, 4.4c, 4.7–4.9, 4.11, 4.12
- Lesson 6: 5.1a,c, 5.4, 5.5, 6.1, 6.4, 6.5  
5.1b,d,e, 5.3, 5.6, 6.2, 6.3
- Lesson 7: 6.7, 6.10, 6.11, 6.12, 6.14, 6.16  
6.6, 6.8, 6.9, 6.13, 6.15, 6.17
- Lesson 8: 7.1a, 7.2, 7.3  
7.1b, 7.4
- Lesson 9: 8.1, 8.3, 8.4, 8.6  
8.2, 8.7
- Lesson 10: 11.2, 10.1, 11.4, 11.6  
11.3, 11.5
- Lesson 11: 12.1, 12.5  
12.2, 12.3, 12.4
- Lesson 12: Problems from previous exams