



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Digital signalbehandling Systems and Signals

EITF75, 6 credits, G2 (First Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED E

Date of Decision: 2023-04-11

General Information

Main field: Technology.

Compulsory for: E3

Elective for: F4, F4-mt, F4-bm, F4-ss

Language of instruction: The course will be given in English on demand

Aim

We use daily equipments in which the signals are stored and treated digitally. From the basic signal processing used in CD-players to advanced processing used in MP3 coding of music, speech coding in GSM, digital video and image processing. The course gives the basic knowledge in digital signal processing and knowledge of signal properties in the time domain as well as in the frequency domain.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- be able to identify applications of digital signal processing and how this is used in modern equipments
- be able to describe digital signals and the properties of digital signals
- be able to describe the relation between the properties in the time domain and in the frequency domain

Competences and skills

For a passing grade the student must

- be able to analyze the signal properties in the time domain and in the frequency domain

- be able to describe the properties of digital circuits

Judgement and approach

For a passing grade the student must

- be able to handle digital signal methods in practical applications
- be able to read literature as well as treat with standards in this area.

Contents

The course deals with time discrete signals and systems. Items such as the Fourier Transform, the Discrete Fourier Transform (DFT) and the z-transformed are treated in the course as well as some basic structures for implementation of digital filters. Also, system function and frequency functions are introduced as well as digital filters. Digital processing of analogue signals using A/D and D/A conversion is studied. In the laboratory work, practical applications of digital signal processing such as speech signals processing and biomedical signals processing are treated. Also, the course includes basic filter design using Matlab and digital signal processors (DSP).

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)

Assessment: Written exam, fulfilled laboratory work and partial tests during the course.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts

Code: 0118. **Name:** Written Exam.

Credits: 5. **Grading scale:** TH. **Assessment:** Approved written exam **Contents:** Written exam

Code: 0218. **Name:** Laboratory Works.

Credits: 1. **Grading scale:** UG. **Assessment:** Approved Laboratory work. **Contents:** Laboratory work

Admission

Assumed prior knowledge: ESS010 or EITA35 Electronics and FMAF01 Analytic Functions and FMAF05 Systems and Transforms.

The number of participants is limited to: No

The course overlaps following course/s: EITF15, ETI240, ETI265, ETI275, ESS040, EITA50, BMEF25

Reading list

- Proakis J G, Manolakis D G: Digital Signal Processing, Principles, Algorithms and Applications. Pearson Prentice Hall, ISBN: 0-13-187374-1.

Contact and other information

Course coordinator: Ove Edfors, ove.edfors@eit.lth.se

Course homepage: <http://www.eit.lth.se/course/eitf75>