Blekinge Institute of Technology
Department for Electrical Engineering

COURSE SYLLABUS

Signalbehandling II

Signal Processing II

7,5 ECTS credit points (7,5 högskolepoäng)

Course code: ET1303
Educational level: Basic level
Course level: G2F
Field of education: Technology
Subject group: Electrical Engineering

Subject area: Electrical Engineering
Version: 18
Applies from: 2007-03-07
Approved: 2009-11-01
Replaces course syllabus approved: 2007-03-07

1 Course title and credit points
The course is titled Signal Processing II/Signalbehandling II and awards 7,5 ECTS credits. One credit point (högskolepoäng) corresponds to one credit point in the European Credit Transfer System (ECTS).

2 Decision and approval
This course is established by The Board of the Department of Electrical Engineering 2007-03-07.
The course syllabus was revised by The Board of the Department of Electrical Engineering and applies from 2007-03-07.
The Department of Signal Processing is responsible for the realization of the course. Reg.no. TEK56-81/07.

3 Objectives
The course extends the basic course in signal processing through letting the students develop theoretical knowledge within modern digital signal processing and through letting the students acquire knowledge of and insight into applied signal processing problems.

4 Content
Central items of the course are:
• Sampling, reconstruction, decimation, interpolation and sample frequency conversion
• Digital filter structures: FIR- and IIR filters
• Design of FIR-filter
• Design of IIR-filter via analog filters
• Discrete Fourier transform (DFT)
• Z-transform
• Spectral estimation

5 Aims and learning outcomes
On completion of the course the student will:
•be able to understand and use the Z-transform.
•be able to understand and use the Discrete Fourier transform.
•be able to design basic FIR/IIR filters and also master various filter structures, as direct form 1, direct form 2 and Lattice.
•be able to estimate effect spectra through classical methods; the periodogram, the Bartlett, Welch, and Blackman-Turkey's methods.
•be able to understand and apply sampling and reconstruction and also decimation and interpolation.

6 Generic skills
The following generic skills are trained in the course:
• General knowledge within the subject area for the studies
• Skill in applying the knowledge in practice
• Solution of problems
• Skill in analysis and synthesis

7 Learning and teaching
The teaching comprises lectures, laboratory work and exercises. The instruction consists of lectures, laboratory work, and exercises. During the arithmetical exercises the exercise supervisor will illustrate how the studied theory should be applied on signal processing problems. In order to further explain the theory and its applications compulsory laboratory work assignments form part of the course. These laboratory work assignments can be done individually or in a group. The instruction is carried out entirely or partly in English..
The teaching language is Swedish. However, the teaching could be carried out in English.

8 Assessment and grading
Examination of the course

Code	Module	Credit	Grade
	Exam[1]	6 ECTS	F/P/3/4/5
	Laboration 1	0.8 ECTS	U/G
	Laboration 2	0.7 ECTS	U/G

[1] Determines the final grade for the course, which will only be issued when all components have been approved.
The course will be graded Fail, Pass, 3, 4 or 5 .The examination will take place through a written examination and also through presentation of the compulsory laboratory work assignments. Grading of the laboratory work assignments is done with the grades Godkänd [Passed] or Underkänd [Failed]. For a final grade of the course the grade Godkänd [Passed] is required for the laboratory work part. On request grades according to ECTS will be given.

9 Course evaluation
The course coordinator is responsible for systematically gathering feedback from the students in course evaluations and making sure that the results of these feed back into the development of the course.

10 Prerequisites
For admission to the course the following courses is required:
- Signal Processing I, ET1203, 7,5 cp [hp]
- Mathematical statistics MS1401, 7,5 cp [hp]

11 Field of education and subject area
The course is part of the field of education and is included in the subject area Electrical Engineering.

12 Restrictions regarding degree
The course cannot form part of a degree with another course, the content of which completely or partly corresponds with the contents of this course.

13 Course literature and other teaching material
Proakis, J.G. & Manolakis D.G. (1995). Digital Signal Processing. (4rd Edition) Prentice-Hall. ISBN 9780.13.22.87319
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