



# HÖGSKOLAN I GÄVLE

## Statistical Signal Processing 7.5 cr

Statistisk signalbehandling 7,5 hp

Set by Board of Technology and Built Environment

### Version

Set at	Valid from
9/26/07	VT2008
9/17/10	VT2011

<b>Level</b>	A1F
<b>Education level</b>	Second cycle
<b>Course identifier</b>	EE444D
<b>Credits</b>	7.5 cr
<b>Main field of study</b>	Electronics
<b>Subject group</b>	Electronics
<b>Disciplinary domain</b>	Technology 100.0 %

**Learning outcomes** The aim of the course is to give a deeper knowledge in statistical digital signal processing.

After finished course the student is expected to:

- Understand and have a good overview of commonly used mathematical tools for statistical digital signal processing
- Understand and be able to use different methods for model based signal processing
- Understand and have a good overview of optimal filters and adaptive filters
- Understand and have a good overview of spectral estimations methods
- Be capable to design and calculate the various kind of digital filters
- Be capable of implementing digital filters and predictors in software
- To some extent be capable of benefiting from scientific reports
- Be capable of finding relevant information on the Internet

**Course content**

- Deterministic and stochastic signals.
- Parametric and non-parametric spectral estimation.
- Effects of quantization.
- Model based signal processing,

- Prediction and estimation
- Wienerfilter
- Kalman filter
- Adaptiv filterering
- Signal processing algorithms for improved energy efficiency in communication systems

**Teaching** The education is performed in lectures. Four homework assignments are a major part of the course. Emphasis is put on the students ability of accomplishing and reporting the work. The education is not mandatory for the student.

**Prerequisites** Corresponding to Signals and systems 15p and Applied mathematics 15p or Stochastic processes 7.5p

**Examination** A written examination is offered at the end of the course.  
For assignments, approved results are required. In case of rejection, the report has to be revised by the student in agreement with the supervisors comments.

**Grade** A, B, C, D, E, Fx, F

**Limitations** For each course two examination opportunities are offered: one at the end of the course and one extra.

The deadline for assignment reports is decided by the examiner. Late reports are not considered until the next time a written exam is given. The report is marked by approval through the signature of the supervisor.

**Other regulations** Certificate of the course is only awarded after completed and approved course and only upon the student's request.

**Sustainable environment** A minor part of the course content deals with sustainable development.

<b>Module</b>			
	0030	Written examination	5.5 cr      Grade: AF
	0040	Assignments	1.5 cr      Grade: AF
	0050	Quiz	0.5 cr      Grade: UG