# 0368.3464.01 Digital Signal Processing (for CS students)

The course is based on the lecturer's textbook "Digital Signal Processing – a Computer Science Perspective" (Wiley : 2000).

Lecture attendance and exercise submissions are mandatory and will be conditions for examination in the course.

Mathematical prerequisites: complex numbers, trigonometric and complex exponential functions, linear algebra, basic calculus

## Topics to be covered

**Signals**

1) What is a signal?
2) Analog and digital signals, the sampling theorem
3) Time and frequency domains, the Fourier transform
4) Spectrum, Hilbert and z transforms, the uncertainty principle

**Signal Processing Systems**

1) Filters and non-filters
2) MA, AR, and ARMA filters
3) Impulse and frequency response, transfer function, pole-zero plots
4) System identification (easy and hard problems)

**Algorithms and Architectures**

1) Graph Theory in DSP
2) The FFT
3) Digital Signal Processors
4) Numeric evaluation (if time permits)

**Applications** (topics will vary from year to year)

1) Voice – compression and recognition
2) Communications signals
3) Financial markets
4) Radar
5) Musical effects