Zurich University of Applied Sciences

School of Engineering

t.SISY1 - Signale und Systeme 1

Person responsible for the course:	Marina de Queiroz Tavares, dqtm
Responsible OU:	
ECTS:	4
Valid for:	2012/2013
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Expertise:

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Methodological skills:

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Social skills:

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Personal skills:

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Learning objectives:

Systems:

The students are able to describe simple technical systems mathematically (LTI systems). Plus they can carry on a detailed analysis of the system behaviour in time and frequency domains, and interpret its results.

Signals:

The students are able to characterise signals, by using the descriptions and analysis methods learned in this semester (Fourier-Series, Fourier-Transformation and Discrete-Fourier-Transformation).

Course content:

Theory:

- Overview (Introduction and Properties of Signals and Systems)
- Signal-Part

o Representation and Analysis of Periodic Signals (Fourier-Series and Spectrum)

o Fourier-Transformation and Properties (representation of non-periodic signals in frequency domain)

o Sampling and Reconstruction of Signals (Sampling Theorem and Aliasing)

o Discrete Signals representation in time and frequency domains

o Discrete Fourier-Transformation

- System-Part

o Representation of dynamic systems with differential equations (mathematical modelling, and simulation with block diagrams)

o Frequency response of linear dynamic systems (bode diagram)

o Time behaviour of linear dynamic systems (step- and impulse-response, plus correspondance to frequency response and the principle of time-bandwidth product)

o System response in time domain via convolution with impulse-response

Laboratory:

- Exercises with PC and extra-hardware (e.g. ADC, DAC, sensors) working out the different subjects treated in

the theory
- Consolidate the theory by applying it to a concrete problem solving
- Tools: Matlab and Simulink , plus conventional equipment from electrotechnic laboratory (e.g. signal generator, oscilloscope)

Previous knowledge:

- Complex numbers, ordinary differential equations, exponential and logaritimic functions, basics of eletricity and mechanics (for examples)

Teaching method:

Type of lesson:	Number of lessons per week:
Lecture	
Tutorial/Practicum	
Block instruction	

Assessment:

According to the table or as specified in writing by the lecture at the beginning of the semester!

description	type	form	scope	assessment	weighting
Performance records during school hours					
Semester end exam					

Language of instruction:

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Instruction material:

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Additional literature:

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Comments:

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