t.INTH - Informationstheorie

Person responsible for the course:	Kurt Hauser, husr
Credits:	2
Valid for:	2010/2011
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Learning objectives:

INTH deals with digital data transmission systems and their optimization:

- The students will get knowledge about the 'source coding' and 'error control coding' issues.

- The students will know how to realize the source coding and the error control coding in practice.

- The students will know the modelling and simulation of digital transmission systems by the use of pseudo noise sequences.

- The students will know the basics of data compression.

- The students will know the basics of channel coding.

Course content:

Theory:

- The information theory (Shannon)

- The definition of entropy in communication theory, calculating entropy.

- Optimized source coding by Huffman and Lempel-Ziv algorithms. Introduction into JPEG.

- Error control coding: Error detection & correction. Hamming distance, channel capacity, Hamming code, BCH-code.

Exercises:

- Entropy and binary memoryless source

- Lossless source coding and Huffman coding

- Data compression based on the dictionary approach.

- Pseudo noise sequences; error correction by the use of block codes.

Previous knowledge:

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Teaching method:

Type of lesson:	Number of lessons per week:
Lecture	8*2
Tutorial/Practicum	6*2
Group teaching	
Block instruction	
Seminar	

Assessment:

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

Number	Type	Weighting
1	End of term exam	70%
2	Exam during the semester	15% + 15%
	Further assessments	

Language of instruction:

German

Instruction material:

Script (80%), Slides (20%)

Written exercises

Literature: Grundlagen der Kommunikationstechnik. Autor: John G. Proakis. Verlag: Pearson Studium.

Comments:

In "Übungen/Praktika": It will be "Übungen".

This course description is for information. If the lecturer himself orders further work to be done it will be his order which has to be fulfilled.