Assessment and subject description

ÓbudA University Kandó Kálmán Faculty of Electrical Engineering			Institute of Communication Engineering	
Subject name and code: Communication Technics II. KHTHI21AND Credits: 7 Full-time, Spring Semester				
Course: Electrical Engineering				
Responsible:	Tibor Wührl PhD	Teaching staff:	Dóra Maros PhD, Zsolt Temesvári PhD, Péter Vámos PhD	
Prerequisites:	KHTHI11AND, KHTHI12AND#			
Contact hours per week:	Lecture: 4	Class discussion: 0	Lab hours: 2	Tutorial: 0
Assessment and evaluation:	Mid-semester test, repeat test if necessary, Exam: written (test) and oral if necessary.			

Subject description

Aims: The subject provides an overview and comprehensive knowledge on different areas of telecommunications.

Topics to be covered:

Topics	**Week**	**Lessons**
Signals and systems, description in time and frequency domain.	1	4
Properties and description of stochastic signals. Autocorrelation and spectral density of wide sense stationary processes.	2	4
Sampling and quantization. Linear and logarithmic quantizer, PCM, A-law quantizer, linear predictive coding.	3	4
Digital base band transmission. PAM, Nyquist criterion, noise matched filter	4	4
Guided wave transmission, twisted pairs, optical waveguides.	5	4
Radio transmission. Antenna gain, path loss, free space path and two-ray ground reflected model	6	4
Source and channel coding. Entropy, Shannon's source coding theorem, Huffman coding, Ziv-Lempel algorithm, linear codes, cyclic codes	7	4
Mid-semester test	8	4
Spectrum efficiency modelling, theory of transmission line planning, speech codecs	9	4
Recess	10	
Error detection solutions: CRC, Checksum, Parity, Hamming codes etc., error correction :ARQ procedures	11	4
Forward error coding, convolutional coding, decoding, Block codes Power and voltage levels, level charts. Return loss and ground symmetry attenuations and measurements	12	1-2 2-4
Measuring of harmonic, intermodulation and stochastic distortion factors, Noise definitions. Measurement of noise in the analog and digital channels.	13	4
Running time, phase rotation, group delay definitions and measurements. Basics of automatic measuring technologies	14	1-2 2-4
Laboratory subjects	**Week**	**Lessons**
Harmonic analysis	8	4
Linear distortions, sampling and quantization	9	4
Baseband digital transmission and intersymbol interference, Nyquist criterion	11	4
Measurement of IQ modulation	12	4
Attenuation measurements	13	4
BER measurements	14	4

Assessment and evaluation: For the signature it is required the successful completing of all the lab sessions and the to reach min. 40% on mid-semester or on the repeat test.

Examination: Written (test) and oral if necessary.

scoring:

0– 39%	1
40– 54%	2
55– 69%	3
70– 84%	4
85–100%	5

Required material:

Simon Haykin: Communications Systems, Wiley, ISBN 0-471-17869-1
John C. Bellamy: Digital Telephony, Wiley, ISBN: 0-471-34571-8
Fazlollah M. Reza: An Introduction to Information Theory, McGraw-Hill, ISBN: 0-486-68210-2

Suggested material: