

Title Advanced Transmission Techniques in Wireless and Satellite Systems	Code POZ04WTS2ICE29
Field Electronics and Telecommunications	Year / Semester 2 / spring
Specialty Information and Communication Technologies	Course elective
Hours Lectures: 2 Classes: - Laboratory: 1 Projects / seminars: -	Number of credits 2

Lecturer:

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Status of the course in the study program:

Elective course for students of Electronics and Telecommunications,
Specialization ICT (in English).

Objectives of the course:

To review the advanced methods of transmission and reception of the signals in today's wireless systems and networks.

Course description:

Lectures: Trellis coded modulations. Continuous phase modulations, GMSK. VA, LVA, CVA. Iterative decoding of serially concatenated convolutional codes, SCCC decoder structure, SISO module. MAP decoder, Max-log-MAP, SOVA. Bit-interleaved coded modulation with iterative decoding (BICM-ID). EXIT charts. Space time diversity, MIMO, STBC, STTC. BI-STCM-ID bit interleaved space-time coded modulation with iterative decoding. OFDM, IEEE802.11a,n PHY. Laboratory: In the simulation experiments (MATLAB) the students study the performance of the selected communication systems.

Initial knowledge:

Matlab (or C++) basics. Fundamentals of digital communication systems, wireless and mobile communications engineering.

Teaching methods:

Lectures, simulation experiments in the lab.

Assessment methods:

Lab reports. Discussion on the subjects presented during lectures.

Bibliography:

1. G. Ungerboeck "Channel coding with multilevel /phase signals" transactions on Information theory, Vol. IT-28, No. 1, 1982
2. B.E. Rimoldi "A decomposition approach to CPM", IEEE Transactions on Information Theory, Vol. 34, No.2, march 1998
3. P.K. Gray "Serially concatenated Trellis Coded Modulation" PhD dissertation, 1999, The Univ. of South Australia

4. Xiadong Li and J.A. Ritcey "Bit-interleaved coded modulation with iterative decoding using soft feedback", Electronics letters, 14th May 1998, Vol. 34, No. 10, pp. 942-943.
 5. S. Benedetto, D. Divsalar, G. Montorsi, F. Pollara "A soft-input soft-output APP module for Iterative decoding of concatenated codes", IEEE Communications Letters, Vol. 1, No. 1, Jan. 1997
 6. A.J. Viterbi „An intuitive justification and a simplified implementation of the MAP decoder for convolutional codes", IEEE JSAC, Vol. 16, No. 2, Feb. 1998.
 7. S. M. Alamouti "A simple transmit diversity technique for wireless communications", JSAC, vol. 16, Oct. 1998.
- and some other papers.