

SYLLABUS

1. Course title:

Information Theory and Coding

2. Code:

TK204

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course: Mandatory Elective**6. Prerequisites:**

[TK101] Signals and Systems

7. Class restrictions:

Students of Faculty of Electrical Engineering, Study program "Electrical Engineering and Computer Science" with fill

8. Duration / semester:

1

5

9. Weekly contact hours:

9.1. Lectures:

3

9.2. Seminars:

1

9.3. Laboratory/Practice classes:

1

10. Faculty:

Faculty of Electrical Engineering

11. Department/study program:

Electrical Engineering and Computer Science

12. Lecturer:

Ph.D. Aljo Mujčić, Full professor

13. Lecturer's e-mail:

aljo.mujcic@untz.ba

14. Web site:

(max. 50 characters)

15. Course aims:

The aim of this course is to provide students with a detailed theoretical and practical knowledge of the information theory and its applications in the field of data compression, channel coding in the process of transmission through communication channels and encrypting information in the process of transmission through an unreliable channel.

16. Learning outcomes:

At the end of the semester/course successful students, who during the whole educational period continuously perform their duties, will be able to:

1. understand the basic algorithms for data compression and forward error correcting,
2. design of complex data compression methods based on cascade connection of several fundamental methods,
3. design of advanced forward error correction methods in communication systems,
4. implementation of channel coding methods on hardware platforms.

17. Course content:

Introduction to information theory. Memory and memory-less information sources. Source coding: statistical and dictionary based methods. Information model of communication channel. Channel coding: block, convolutional and composed codes. Implementation of channel coding methods on hardware platform.

18. Learning methods:

Lecturing with projected presentations and necessary derivations on blackboard, with active student participation. Seminars include problem solving and use cases based on information theory, data compression and channel coding methods. Laboratory experiments cover these topics and verify lecture theory. Laboratory is based on experimental sessions including design of data compression methods, channel coding methods and implementation on hardware platforms.

19. Assessment methods:

Continuous assessment during the semester including the two tests during the semester, and the final exam. From two tests during the course students can collect a maximum of 50 points (25 points for each test). The first test is done in the 8th week of the semester and includes the material presented in the first 7 weeks of the semester. The second test is done in the last week of the semester and includes the material presented in the second part of the semester. Final examinations are taken in writing. On the final exam student can achieve a maximum of 50 points.

20. Assessment components:

Final grade is based on the total number of points earned by completing tests during semester and a final exam. The student can achieve a maximum of 100 points according to the following scale:

The first test 25

The second test 25

Total points during semester 50

The final exam counts for 50 points

Total 100

21. Required reading list:

1. A. Mujčić, N. Suljanović, A. Hasanović, "Teorija informacija i kodovanje", Izdavačka kuća Hamidović, Tuzla, 2010.
2. D. Drajić, Teorija informacija i prenos podataka, Elektrotehnički fakultet, Beograd.

22. Web sources:

(max. 687 characters)

23. Applicable starting from the academic year:

2016/2017

24. Adopted in the Faculty/Academy session:

04.04.2016