# Specification for the book of courses

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| **Study program** | | | Electrical Engineering and Computer Science | |
| **Module** | | | Communications and Information Technologies - Communications and Information Processing | |
| **Type and level of studies** | | | Undergraduate Academic Studies | |
| **The name of the course** | | | Data Analysis and Compression | |
| **Lecturer (for lectures)** | | | Perić H. Zoran, Jovanović Ž. Aleksandra, Nikolić R. Jelena | |
| **Lecturer/associate (for exercises)** | | | Jovanović Ž. Aleksandra, Nikolić R. Jelena | |
| **Lecturer/associate (for OFE)** | | | | |
| **Number of ECTS** | 6 | **Course status (obligatory/elective)** | | Elective |
| **Prerequisites** | | | | |
| **Course objectives** | Studying methods for analyzing signals and data, as well as the techniques for lossless and lossy compression. Training for the practical application of acquired knowledge in processing various types of signals and data. | | | |
| **Course outcomes** | Theoretical knowledge in the field of lossless and losy compression. Developed ability to process different signals and data using compression techniques, but also to modify existing ones in order to find better solutions. | | | |
| **Course outline** | | | | |
| **Theoretical teaching** | Signal and data analysis methods. Lossless compression. Compression based on Huffman, Golomb-Rice and arithmetic coding. Codes based on dictionary techniques. Lempel-Zive codes. Lossy compression. Scalar and vector quantization. Transform coding. Sub-band coding. Wavelet-based compression. Speech and audio coding. Video compression. | | | |
| **Practical teaching (exercises, OFE, study and research** | Study and solve selected problems from the areas that are covered by the content of the subject. | | | |
| **Textbooks/references** | | | | |
| 1 | D. Drajic, P. Ivanis, Introduction in information theory and coding (in Serbian), Academic mind, Belgrade, 2009. | | | |
| 2 | D. Salomon, Variable-length Codesfor Data Compression, Springer, 2007. | | | |
| 3 | K. Sayood, Introduction to Data Compression, Elsevier, Morgan Kaufmann; 4th edition, 2012. | | | |
| 4 | K. Sayood, Lossless Compression Handbook, Academic Press, 2012. | | | |
| 5 | D. Radunović, Wavelets, Springer, 2009. | | | |

| **Number of classes of active education per week during semester/trimester/year** | | | | |
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| **Lectures** | **Exercises** | **OFE** | **Study and research work** | **Other classes** |
| 3 | 2 | 0 | 0 | 0 |
| **Teaching methods** | Lectures, PowerPoint presentations, auditory exercises, homework assignments, consultations. | | | |

| **Grade (maximum number of points 100)** | | | |
|---|---|---|---|
| **Pre-exam duties** | **Points** | **Final exam** | **Points** |
| **Activity during lectures** | 5 | **Written exam** | 20 |
| **Exercises** | | **Oral exam** | 20 |
| **Colloquia** | 35 | | |
| **Projects** | 20 | | |