



EUROPEAN UNION  
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Zdroj: <https://predmety.fbmi.cvut.cz/cs/doktorske-bme>

Name of study subject: **Multidimensional processing of physiological data**

**Brief annotation of the subject:**

The course reacts to the advances in the area of sensing and recording data of patient examination and animal and clinical experiments. The aim is to develop the ability to identify and evaluate the processes captured in the data, including their dynamics, and capture these processes into realistic mathematical models of physiological and pathophysiological phenomena. Pre-processing and data synchronization, computational efficiency, trend and pattern identification, dynamic and stochastic models, visualization of measured data and model outputs are also discussed. The multidimensional nature of the data will be respected.

**Brief Syllabus of Lectures:**

1. Signal characteristics
2. Genesis of biological signals
3. Design of experiments
4. Multidimensional data recording
5. Issues of processing big and multidimensional data
6. Signal filtering
7. Fourier transform
8. Spectral analysis
9. Correlation analysis
10. Wavelet transformation
11. Hilbert's transformation
12. Cepstral analysis
13. Cluster analysis
14. Classification of data