

BIOMEDICAL SIGNAL PROCESSING

1. SYLLABUS INFORMATION

1.1. Course title

Biomedical Signal Processing

1.2. University

Pázmány Péter Catholic University

1.3. Semester

1st year, 1st semester

2. COURSE DETAILS

2.1. Course nature

Pooled elective

2.2. ECTS Credit allotment

4

2.3. Recommendations

Basic Mathematics, Physics, English, and MATLAB knowledge.

2.4. Faculty data

Dr. Benedek Csaba

3. COMPETENCES AND LEARNING OUTCOMES

3.1. Course objectives

To learn the basic techniques in signal processing that are relevant for biomedical signals.

3.2. Course contents

Biomedical signal genesis; signal representation; signal decomposition; source separation; AR estimation; Fourier analysis; frequency-time analysis; wavelets; sparse decomposition; data fusion; classification; non-stationary signals. Examples of signal modalities we will consider: pulse oximetry, phonocardiography, ECG, EEG.

3.3. Course bibliography

R M Rangayyan (2002): Biomedical Signal Analysis: A Case-Study Approach

L Sörnmo and P Laguna (2005): Bioelectrical Signal Processing in Cardiac and Neurological Applications

Mallat (2008): A Wavelet Tour of Signal Processing, 3rd edition, The Sparse Way

4. EVALUATION

Required knowledge: basic Mathematics, Physics, English, and MATLAB knowledge.

The first two of these will be tested using an Initial Assessment that will allow the student to ascertain whether they have the required knowledge. A term mark will be given -- for details, please see the course description.