SYLLABUS

Name: ***Biomedical Data Acquisition (IBioAIB>SI3BDA23S)***
Name in Polish:
Name in English: ***Biomedical Data Acqusition***

Information on course:

Course offered by department: Faculty of Biomedical Engineering
Course for department: Silesian University of Technology
Term: Winter semester 2024/2025
Cordinator of course edition: Dr inż. Aleksandra Badura

Default type of course examination report:

ZAL

Language:

English

Short description:

The course aims to familiarize with biomedical signals, their registration, and their analysis. The set of biomedical signals includes ECG, EEG, EMG, EOG, BVP, and EDA.

Description:

The scope of the subject includes recording and analysis of the following biomedical signals: ECG (electrocardiography), EEG (electroencephalography), EMG (electromyography), EOG (electrooculography), BVP (pulse wave), EDA (electrodermal activity). Students will define a research problem related to the selected signal and conduct a study according to a self-defined protocol. Literature studies should precede defining the hypothesis/research problem. In the next stage, students will analyze a given biomedical signal. The result of the project is a report and/or presentation showing the research results and conclusions.

Bibliography:

[1] Proakis JG, Manolakis DG: Digital Signal Processing. Principles, Algorithms and Applications. Macmillan, 1992

[2] Akay M: Detection and Estimation Methods for Biomedical Signals. Academic Press, 1996

[3] Rangayyan RM: Biomedical Signal Analysis. A Case-Study Approach. IEEE Press, Wiley-Interscience, 2002. ISBN 0-471-20811-6

[4] Webster JG, Clark JW. Medical instrumentation: application and design. 4th ed. Hoboken, NJ: John Wiley, c2010.

[5] Marschall SR: Netter's cardiology. 2nd ed. Philadelphia: Saunders/Elsevier, 2010.

Learning outcomes:

KNOWLEDGE

K1A_W13
K1A_W16
Students have general knowledge in terms of anatomy, chemistry, electrical engineering and electronics and programming techniques

K1A_W16
Students know the correct methods of acquisition of biomedical signals such as ECG, EEG, EMG, and EOG, and they understand the aspect of modifying measurement methods. They are aware of the constant acquisition and expansion of his knowledge in this vast area

SKILLS

K1A_U19
Students can use terminology regarding electrodiagnostic signals to the extent that allows for understanding and creating oral and written statements

K1A_U05
K1A_U12
K1A_U14
Students can design and conduct a simple experiment using biomedical signals (ie: ECG, EEG, EMG, EOG)

SOCIAL COMPETENCES

K1A_K03
Students are ready for taking responsibility for one's work and submitting to the rules of working in a team, and taking responsibility for jointly performed tasks

K1A_K05
Students are ready to take steps to detect and eliminate the impact of typical technical and physiological errors in the case of recording biomedical signals such as ECG, EEG, EMG, and EEA, and is ready to analyze malfunctioning systems that may lead to serious financial, social, or social losses to serious loss of health and even life

Assessment methods and assessment criteria:

The final grade is based on the report and/or the presentation at the end of the semester.

Information on course edition:

Default type of course examination report:

ZAL

Bibliography:

missing bibliography in English

Details of classes and study groups

project (30 hours)

Study groups details

Group number 1

Class instructors:
Dr inż. Aleksandra Badura

Element of course groups in various terms:

Course group description	First term	Last term
missing group description in English (IBioAIB>SI-3-23-S)	2024/2025-Z	

Course credits in various terms:

<without a specific program>

Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	2	2024/2025-Z	