

Lecture on Biological Signal

Special Subjects
Elective 2 credit

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1. Course Description

In this lecture course, both the methodology of biological signal measurement and biological signal processing are concerned. In particular, a number of signals such as electrocardiogram (ECG), electromyography (EMG), electroencephalogram (EEG), photoplethysmogram (PPG) and Ballistocardiogram are dealt with.
This course relates to DP3.

2. Course Objectives

If one wants to know about living bodies, especially the human body, living bodies have to be measured in some way or another. In this way, biological signals can be obtained. The aim of this course is to learn about the general and particular ways of handling biological signals.

3. Grading Policy

Students will be required to submit two reports within the 15 weeks (35%+35%). In the end of the course, students will take the final oral assessment exam (70%).

4. Textbook and Reference

Textbook

Yamakoshi and Togawa Two Japanese textbooks (ISBN:978-4339071313)
CORONA PUBLISHING CO., LTD.

Reference

Tatsuo Togawa, Toshiyo Tamura, P. Ake Oberg Biomedical Sensors and Instruments, Second Edition
CRC Press

5. Requirements(Assignments)

The knowledge of LMS is required.

Preparation and review will be instructed in class.

Preparation should survey about concept of mathematics, physics and chemistry.

For review, please summarize each class in one paper.

6. Note

If you would have any question, don't hesitate to contact with Ogawa.

7. Schedule

- [1] Introduction
- [2] Measurement of inner pressure (1)
- [3] Measurement of inner pressure (2)
- [4] Measurement of flow in the body (1)
- [5] Measurement of flow in the body (2)
- [6] Measurement of kinematics
- [7] Measurement of dynamics
- [8] Thermal physiology
- [9] Electromagnetic phenomenon and measurement on living body (1)
- [10] Electromagnetic phenomenon and measurement on living body (2)
- [11] Electromagnetic phenomenon and measurement on living body (3)
- [12] Biochemistry measurement (1)
- [13] Biochemistry measurement (2)
- [14] Digital signal processing for biological signal
- [15] Hot-topics on biological signal