

Biological Engineering

Syllabus Number

3E343

Special Subjects

Elective 2 credit

OGAWA, Mitsuhiro

1. Course Description

Students attend a total of 15 weeks of classes in this subject.

The main topics are how human recognize the living, living body, organ, tissues and cell.

Physiological and Biochemical parameters and those significance that will be discussed on.

This course relates to DP4E.

2. Course Objectives

The aim of this course is to study Biomedical engineering. Biomedical engineering includes two areas. The first one is analyses of living organisms using methodology combining several engineering fields, physics, chemistry and mathematics. The second one is the syntheses of medical (and/or healthcare) device design. In this course, the practical application of biomedical engineering such as medical devices is studied.

3. Grading Policy

Final and Middle Exam: 60%

Report#1 and #2: 40%

The results will be informed and reviewed mainly via LMS.

4. Textbook and Reference

Textbook

Yamakoshi, Murakami and Tamura Japanese textbook (ISBN: 978-4339072747) is used.

CORONA PUBLISHING CO., LTD.

Reference

Yamakoshi and Togawa Japanese textbook (ISBN: 978-4339071313) .

CORONA PUBLISHING CO., LTD.

Togawa, Oberg and Tamura English textbook (ISBN: 978-1420090789) CRC Press

5. Requirements(Assignments)

For preparation, 90 min are required for each class in standard. You should read sections of textbook instructed in classes.

For review, 90 min are required for each class in standard. Practice questions for review will be distributed in class.

The 9th class will give review about learning and discussion of learning in future.

6. Note

LMS will be used in this course.

Function calculator can be used for final and middle exam.

7. Schedule

- [1] Introduction
- [2] General consideration of biomedical engineering
- [3] Hot-topics of biomedical engineering (1)
- [4] Physiological measurement (Electric)
- [5] Physiological measurement (Magnetic)
- [6] Physiological measurement (Thermal)
- [7] Practical Physiological measurement (Electric)
- [8] Middle exam
- [9] Categorization of medical devices; Discussion
- [10] Medical devices (ECG, EEG)
- [11] Medical devices (Blood Pressure meter and thermometer)
- [12] Surgical operation devices; basic
- [13] Surgical operation devices; modern devices such as surgical robot
- [14] Hot-topics of biomedical engineering (2), Preparation of final exam.
- [15] Final exam and summary