

Advanced Biological Engineering

2 units (selection)

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Target) Understanding modeling and clarification of biological functions and their applications on engineering.

Outline) This lecture introduces fundamental technologies to apply engineering technologies for medical field, such as, diagnoses, treatment and function substitution; growth of engineering based on biological mechanisms; functional characteristics of biological systems and their information processing basics of application for control. The topics are 1. physiological characteristics of biological system, 2. biological measurement, 3. medical equipments for diagnosis or treatment, 4. equipments for replacement or assistance of biological functions, 5. functions of nerve system, 6. applications of artificial neural networks.

Style) Lecture

Keyword) *biomedical engineering, neural network, signal processing*

Goal)

1. Understanding of modeling of biological neural network function and its analysis
2. Understanding of modeling of biological control system and its analysis
3. Understanding of modeling of biological sensory system

Schedule)

1. Physiological functions of a neuron and their mathematical models
2. Modeling of neural networks
3. Functional analysis of artificial neural networks
4. Applications of artificial neural networks on engineering
5. Signal processing using artificial neural networks
6. Exercise in neural networks
7. Various modeling of neural networks
8. Modeling of biological control scheme
9. Analysis of biological control scheme
10. Information processing in biological visual system
11. Information processing in biological auditory system
12. Introduction of biosensors
13. Introduction of biomedical engineering 1
14. Introduction of biomedical engineering 2
15. Introduction of biomedical engineering 3

Evaluation Criteria) レポートと出席状況より評価する.

Contents) <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216729>

Student) Able to be taken by only specified class(es)

Contact)

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Note) This lecture will be given in English.