

Syllabus

1. Course title, style, and credit: Fundamental Neuroscience I

(✓) Lecture () Discussion () Practice 1 credit

2. Eligible departments and appropriate grade level: Department of Physiological Sciences, School of Life Science

(✓) D1, (✓) D2, (Δ) D3, (Δ) D4, (Δ) D5; Δ, optional

3. Lecturers' division : Cerebral Circuitry, Visual Information Processing, Homeostatic Development

4. (oral) Friday 10:00-12:00 from November 2019 through January 2020 (see below)

5. (oral) Lecture room, NIPS Myodaiji Building 1F or Seminar room B of the Yamate 3rd Building, 9F

6. Prerequisites and styles

Each lecture begins with basic introduction. There is no lecture course that must be completed in advance. The entire course will be presented in English.

7. Contents:

In order to understand the mechanisms for information processing in the brain, it is important to learn the properties of individual neurons and neural circuits. In this lecture series, we will focus on several basic brain functions and introduce their circuit mechanisms.

8. Course objectives:

- (1) To understand the diversity of neurons and the property of synaptic connections.
- (2) To understand circuit model for information processing.
- (3) To understand the neural basis of sensory and motor functions.
- (4) To understand the neural basis of memory.
- (5) To understand the function of glia cells.

9. Grades:

Students will select one of themes and submit an essay report by the deadline. The

grades will be determined by the quality of the report. Students must attend at least half of the lectures to get credit.

10. Schedule:

(1) November 1st, 2019 (Yamate area)

‘Neuron diversity and microcircuitry of cortex’ Yoshiyuki Kubota

(2) November 8th, 2019 (Yamate area)

‘Construction and operating characteristic of cortical network model’ Takeshi Otsuka

(3) November 15th, 2019 (Myodaiji area)

‘Motor function’ Rie Kimura

(4) November 29th, 2019 (Myodaiji area)

‘Visual function (retina and thalamus)’ Kenji Hayashi

(5) December 6th, 2019 (Myodaiji area)

‘Visual function (primary and higher visual cortex)’ Yumiko Yoshimura

(6) December 13, 2019 (Myodaiji area)

‘Optical imaging and manipulation of learning & memory’ Hideji Murakoshi

(7) December 20, 2019 (Myodaiji area)

‘Neuronal circuits processing somatosensory information’, Junichi Nabekura/Kei Eto

(8) January 24, 2020 (Myodaiji area)

‘Physiological functions of glial cells’ Hiroaki Wake (Kobe University)