



Syllabus Reference

Course title	System Neuroscience 1		
Term	後期 2nd Half		
Credit(s)	1		
The main day		The main period	
Program/Department	48 Physiological Sciences		
Lecturers	Hiromasa Takemura, Keiichi Kitajo, and others		
成績評価区分 Grading Scale	A, B, C, Dの4段階評価 Four-grade evaluation		
レベル Level	Level 3		
力量 Competence	専門力 Academic expertise、独創性 Creativity		

Instructor

Full name

* TAKEMURA HIROMASA

KITAJO KEIICHI

GODA NAOKAZU

CHIKEN SATOMI

NINOMIYA TAIHEI

NORITAKE ATSUSHI

HATANAKA NOBUHIKO

OKAZAKI (OHASHI) YUKA

Outline

In this lecture, anatomy and function of the central nervous system, focusing on the cerebral cortex, basal ganglia, and cerebellum, and methods for their analysis will be explained, aiming at a systematic understanding of brain functions. In the first and second lectures, physiological findings on the neural mechanisms of the visual system will be discussed, including the results of neuroimaging studies on humans. In the third and fourth lectures, the control mechanisms of voluntary movements in the cerebral cortex, basal ganglia, and cerebellum will be discussed from both physiological and pathological perspectives. In the 5th and 6th lectures, neural mechanisms related to social cognition will be explained in terms of both action information processing and reward information processing. In the 7th and 8th lectures, mathematical modeling, information theory, complex network analysis, and machine learning will be introduced to explore the operating principles of the integrated functions of the brain.

Learning objectives

- (1) Understand neural basis of visual processing.
- (2) Understand neural basis of motor control.
- (3) Understand neural basis of social cognition.
- (4) Understand characteristics and significance of various advanced methods for investigating neural dynamics.

Grading policy

Attendance of at least half of the lectures is required. Students are required to select one of the lectures they attended and submit a report summarizing the content of the lecture in 750–1500 words (in English) based on the above learning objectives. Students who submit the report by the deadline will be given an absolute grade of A, B, C, or D according to their level of understanding.

Lecture Plan

Schedule: Oct 25 – Dec 13, 2024, 10:00–11:30 on Fridays (Following schedule is a subject to change. Please check the course website for the latest information. The URL is described below.)

Contents:

[1] Oct 25th: Hiromasa Takemura, "Anatomy, physiology and psychology of visual

	<p>perception (I)”</p> <p>[2] Nov 1st: Naokazu Goda, “Anatomy, physiology and psychology of visual perception (I)”</p> <p>[3] Nov 8th: Nobuhiko Hatanaka, “Motor control by cerebral cortex, basal ganglia, and cerebellum (I)”</p> <p>[4] Nov 15th: Satomi Chiken, “Motor control by cerebral cortex, basal ganglia, and cerebellum (II)”</p> <p>[5] Nov 22th: Taihei Ninomiya, “Social Cognition I (action processing)”</p> <p>[6] Nov 29th: Atsushi Noritake, “Social Cognition II (reward processing)”</p> <p>[7] Dec 6th: Keiichi Kitajo, “The dynamics of neural oscillations I (computational approach)”</p> <p>[8] Dec 13th: Yuka Okazaki, “The dynamics of neural oscillations II (experimental approach)”</p>
Location	Zoom online
Language	English
Textbooks and references	Not applicable
Notes for students of other programs	Not applicable
Related URL	https://www.nips.ac.jp/graduate/curriculum.html
Explanatory note on above URL	Please keep be updated on the latest schedule from ” Schedule of the classes” on the program website.
Contact for Course Inquiries	Hiromasa Takemura (htakemur@nips.ac.jp)

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