

## Syllabus Reference

Course title	Basic physiological and anatomical brain science		
Term	前期 1st Half		
Credit(s)	1		
The main day		The main period	
Program/Department	48 Physiological Sciences		
Lecturers	Hiromasa Takemura, Tomomi Nemoto, 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 2		
力量 Competence	専門力 Academic expertise、独創性 Creativity		

## Instructor

## Full name

\* TAKEMURA HIROMASA

NEMOTO TOMOMI

KITAJO KEIICHI

TATEYAMA MICHIIRO

MURAKOSHI HIDEJI

ENOKI RYOSUKE

TOMATSU SAEKA

OTSUKA TAKESHI

SATAKE SHINICHIRO

LUO, Junxiang

ONODERA KOUN

## Outline

Basic knowledge on physiology and anatomy of the brain, computer science and image processing can be learned through 10 lectures.

## Learning objectives

- After completing this course, students can discuss with others on basic neuroscience.
- After completing this course, students can write a summary of a research paper.
- After completing this course, students can acquire basic knowledge on computer science and imaging processing which is necessary for performing research on physiology.

## Grading policy

- Students must attend at least the half of the lectures to get credit.
- Write a summary report on the one of lectures. The report will be graded by the lecturer on the basis of a level of understandings on the lecture. (50% for each)

## Lecture Plan

Schedule : May 14 – July 16, 2025, 10:00–11:30 on Wednesdays (Following schedule is a subject to change. Please check the course website for the latest information. The URL is described below. )

## Contents:

[1] Chapter 2, 3, 4 (May 14. Tateyama)

2. Neurons and Glia

3. The Neuronal Membrane at Rest

4. The Action Potential

[2] Chapter 5, 6, 7 (May 21, Satake)

5. Synaptic Transmission

6. Neurotransmitter Systems

7. The Structure of the Nervous System

[3] Chapter 8, 9, 10 (May 28, Onodera)

8. The Chemical Senses

9. The Eye

10. The Central Visual System

[4] Chapter 11, 12, 13 (June 4, Tomatsu)

11. The Auditory and Vestibular Systems

	12. The Somatic Sensory System 13. Spinal Control of Movement [5] Chapter 14, 15, 16 (June 11, Otsuka) 14. Brain Control of Movement 15. Chemical Control of the Brain and Behavior 16. Motivation [6] Chapter 17, 18, 19 (June 18, Enoki) 17. Sex and the Brain 18. Brain Mechanisms of Emotion 19. Brain Rhythms and Sleep [7] Chapter 20, 21, 22 (June 25, Luo) 20. Language 21. The Resting Brain, Attention, and Consciousness 22. Mental Illness [8] Chapter 23, 24, 25 (July 2, Murakoshi) 23. Wiring the Brain 24. Memory Systems 25. Molecular Mechanism of Learning and Memory [9] Basics of computer science. (July 9, Kitajo) [10] Fundamentals of image processing (July 16, Nemoto)
Location	Zoom Online
Language	English
Textbooks and references	Neuroscience: Exploring the Brain (4th ed.) Bear, Connors, & Paradiso. However it is not mandatory to bring it to class. Students can request to borrow the textbook.
Notes for students of other programs	Not applicable
Related URL	<a href="https://www.nips.ac.jp/graduate/curriculum.html">https://www.nips.ac.jp/graduate/curriculum.html</a>
Explanatory note on above URL	Please keep be updated on the latest schedule from "Schedule of the classes" on the program website.
Others	Assignment: 1. Read the textbook before coming to class.
Contact for Course Inquiries	Hiromasa Takemura (htakemur@nips.ac.jp)

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