

Course Syllabus  
SIPS 531  
Academic Year 2025  
Department of Physiology  
Faculty of Medicine Siriraj Hospital, Mahidol University

Course ID and name: SIPS 531 NEUROSCIENCE I  
 Course coordinator: Asst. Prof. Sompol Tapechum, M.D., Ph.D.  
 Instructors: Asst. Prof. Sompol Tapechum, M.D., Ph.D.  
 Assoc. Prof. Chailerd Pichitpornchai M.D., Ph.D.  
 Assoc. Prof. Narawut Pakaprot M.D., Ph.D.  
 Lect. Rujapope Sutiwisesak M.D., Ph.D.  
 .....  
 Credits: 1 (1-0-2) (lecture – laboratory – self-study)  
 Curriculum: Masters of Science Program in Medical Physiology  
 Course type:  Core  Required  Electives  
 Semester offering: 2/2025  
 Prerequisite: None  
 Date of Latest Revision: .....

**Course Description:**

Cellular elements of nervous tissue, Electrical signaling in neurons, Fundamental properties of nerve action potential, Synaptic transmission, Neuronal network and Plasticity, Structures and Functions of Skeletal muscles, Properties of Skeletal muscle contraction, Physiology of Cardiac and Smooth muscles, Autonomic nervous system.

**Course-level Learning Outcomes (CLOs)**

Upon completion of this course, students are able to:

1. Explain the structures and functions of nervous system at cellular levels (ELO1,4)
2. Explain the structures and functions of muscular system (ELO1,4)
3. Describe the structures and functions of autonomic nervous system (ELO1,4)
4. Apply basic neuroscience knowledge to solve problems about the nervous system and muscular system (ELO1,2,4)

**Constructive Alignment of CLOs and Program's ELOs**

| CLOs   | ELO1 | ELO2 | ELO3 | ELO4 |
|--|------|------|------|------|
| 1. Explain the structures and functions of nervous system at cellular levels | I    |      |      | R    |

|  |   |   |  |   |
|--|---|---|--|---|
| 2. Explain the structures and functions of muscular system   | I |   |  | R |
| 3. Describe the structures and functions of autonomic nervous system                                 | I |   |  | R |
| 4. Apply basic neuroscience knowledge to solve problems about the nervous system and muscular system | I | I |  | R |

**Remarks:** Show the level of the course management with the symbols I, R, P, and M.

### Program's Expected Learning Outcomes

1. Demonstrate the current medical physiological knowledge for common clinical application.
2. Evaluate the scientific research and major research developments.
3. Perform medical physiology research with a technique in an ethical way to test an idea or hypothesis in an area of interest.
4. Communicate knowledge and ideas of medical physiological research clearly to peers and the scientific community at national level.

**Table: Alignment of program ELOs and the contribution of individual courses.**

| Code             | Name           | Credits  | ELO of MSc program |   |   |   |
|------------------|----------------|----------|--------------------|---|---|---|
|                  |                |          | 1                  | 2 | 3 | 4 |
| Required courses |                |          |                    |   |   |   |
| SIPS531          | Neuroscience 1 | 1(1-0-2) | ●                  | ◐ |   | ○ |

● Course outcomes, contents, teaching and learning approaches of this course are fully aligned with the ELO.

◐ Course outcomes, contents, teaching and learning approaches of this course are aligned with the ELO at the intermediate level.

○ Course outcomes, contents, teaching and learning approaches of this course are aligned with the ELO at the basic level.

**Table: Relationship between Courses of the Program and Program Learning Outcomes**

| Code             | Name           | Credits  | ELO of MSc program |   |   |   |
|------------------|----------------|----------|--------------------|---|---|---|
|                  |                |          | 1                  | 2 | 3 | 4 |
| Required courses |                |          |                    |   |   |   |
| SIPS531          | Neuroscience 1 | 1(1-0-2) | I                  | I |   | R |

I = ELO is introduced & assessed

R = ELO is reinforced & assessed

P = ELO is practiced & assessed

M = Level of Mastery is assessed

Course Schedule and teaching/assessment plan

| No.                             | Topic  | Hours     |            |            | CLOs | Teaching & learning strategy      | Assessment (in-class)  | Lecturers   |
|---------------------------------|--|-----------|------------|------------|------|-----------------------------------|------------------------|-------------|
|                                 |  | Lecture   | Laboratory | Self Study |      |                                   |                        |             |
| 1                               | Cellular elements of nervous tissue              | 1         | -          | 2          |      | Asynchronous lecture              | Post-learning exercise | Dr.Rujapope |
| 2                               | Electrical signaling in neurons                  | 1         | -          | 2          |      | Asynchronous lecture              | Post-learning exercise | Dr.Narawut  |
| 3                               | Fundamental properties of nerve action potential | 2         | -          | 4          |      | Reading assignment and Discussion | Performance            | Dr.Narawut  |
| 4                               | Synaptic transmission                            | 1         | -          | 2          |      | Asynchronous lecture              | Post-learning exercise | Dr.Sompol   |
| 5                               | Neuronal network and Plasticity                  | 2         | -          | 4          |      | Reading assignment and Discussion | Performance            | Dr.Sompol   |
| 6                               | Structures and Functions of Skeletal muscles     | 2         | -          | 4          |      | Asynchronous lecture              | Post-learning exercise | Dr.Chailerd |
| 7                               | Properties of Skeletal muscle contraction        | 2         | -          | 4          |      | Reading assignment and Discussion | Performance            | Dr.Chailerd |
| 8                               | Physiology of Cardiac and Smooth muscles         | 2         | -          | 4          |      | Asynchronous lecture              | Post-learning exercise | Dr.Rujapope |
| 9                               | Autonomic nervous system                         | 2         | -          | 4          |      | Reading assignment and Discussion | Performance            | Dr.Sompol   |
| <b>Total hours of the study</b> |  | <b>15</b> | <b>-</b>   | <b>30</b>  |      |                                   |                        |             |

## Course Assignments

Assignment materials; reading, VDO

## Assessment Criteria

### GRADE DISTRIBUTION

80% Summative examination  
20% Performance in discussion classes

|   | 4  | 3   | 2   | 1  | 0  |
|---|--|---|---|--|--|
| How well does the student participate in class by presenting data/asking questions/offering ideas? (Frequency of contributions) | Frequently and voluntarily (*Does not prevent others from answering)                               | Voluntarily   | Responses only after being questioned or named                          | Rarely, reluctantly  | Never  |
| How good is the quality of student's contributions? (Quality of contributions)  | Demonstrates comprehensive knowledge and critical thinking skills                                  | Mostly relevant, reflecting understanding of knowledge                | Somewhat relevant, reflecting some levels of understanding of knowledge | Not relevant, reflecting insufficient understanding of knowledge                         | Lacks understanding of knowledge or infrequent contributions     |
| How well does the student behave during presentation? (Behavior in class)   | Actively and respectfully pays attention to peers/instructor; full engagement throughout the class | Pays attention to peers/instructor; engages most of the time in class | Listens to peers/instructor   | Sometimes does not listen to peers/instructor; sometimes displays inappropriate behavior | Fails to pay attention; displays inappropriate behavior in class |

### GRADE SCALE

A 80 to 100%  
B+ 65 to <80%  
B 50 to <65%  
F <50%  
I-1

- I-2 Retake the exam and/or complete the assigned work within one month after the exam result is announced.
- I-3 Complete the assigned work and retake the new evaluation within the next semester.
- Repeat the course as soon as it is offered.

### **Appeal Procedure**

Students are able to inquire about their scores or grade directly to the course coordinator either by direct contact, telephone or email within 1 week after the scores or grade is announced. The appealing though the program is also available.