Course Syllabus

SIPS 537 Integrative Physiology Academic Year 2025

Department of Physiology, Faculty of Medicine Siriraj Hospital, Mahidol University

Course ID and name:	SIPS 537: Integrative Physiology
Course coordinator:	Assoc. Prof. Chantacha Sitticharoon, MD, PhD
Instructors:	Assoc. Prof. Sorachai Srisuma, MD, PhD
	Assist. Prof. Sompol Tapechum, MD, PhD
	Assoc. Prof. Panapat Uawithya, MD, PhD
	Assoc. Prof. Narawut Pakaprot, MD, PhD
	Lecturer Rujapope Sutiwisesak, PhD, MD
	Lecturer Kanat Chanthongdee, MD, PhD
	Lecturer Thanus Teeratitayang-gool, MD
Credits:	1 (1-0-2) (lecture – laboratory – self-study)
Curriculum:	Masters of Science Program in Medical Physiology
Course type:	☐ Core ☑ Required ☐ Electives
Semester offering:	02/2025
Prerequisite:	None
Date of Latest Revision:	08/12/2025

Course Description:

Body holistic functions in thermoregulation, exercise; physiological changes related with pregnancy and birth, aging and frailty; circulation through special body regions; physiological changes leading to shock, hypertension, non-communicable diseases; contemporary topics of integrative physiology

Course-level Learning Outcomes (CLOs)

Upon completion of this course, students are able to:

1. Explain integrative physiological mechanisms of thermoregulation, exercise, pregnancy, aging, frailty, circulation in special body regions, and systemic changes in shock, hypertension, and non-communicable diseases.

2. Apply integrative physiological knowledge to analyze biological and clinical problems related to health and disease.
3. Participate effectively in discussions on contemporary topics in integrative physiology.

Constructive Alignment of CLOs and Program's ELOs

CLOs	ELO1	ELO2	ELO3	ELO4
1. Explain integrative physiological mechanisms of thermoregulation, exercise, pregnancy, aging, frailty, circulation in special body regions, and systemic changes in shock, hypertension, and non-communicable diseases.	P	R		R
2. Apply integrative physiological knowledge to analyze biological and clinical problems related to health and disease.	P	R		R
3. Participate effectively in discussions on contemporary topics in integrative physiology.	P	R		R

Remarks: Show the level of the course management with the symbols I (Introduced & assessed), R (Reinforced & assessed), P (Practiced & assessed), and M. (Level of Mastery is assessed)

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.

Course Schedule and teaching/assessment plan

No.	Topic	Date & Time	Hours			CLOs	Teaching & learning strategy	Assessment	Lecturers
			Lec-ture	Labo-ratory	Self-Study				
1	Course orientation	Mon 2 Mar 26 10.00-10.30	0.5		1	1	Lecture	In-class Q&A	Assoc. Prof. Chantacha Sitticharoon
2	Body holistic functions in thermoregulation	Mon 2 Mar 26 11.00-12.00	1		2	1	Lecture, interactive Q&A	In-class Q&A	Assist. Prof. Sompol Tapechum
3	Exercise physiology 1: Laboratory practice + Take-home assignment	Wed 4 Mar 26 10.30-12.00		1.5	0.75	1, 2	Laboratory	Rubric score (performance), Rubric score (assignment)	Assoc. Prof. Sorachai Srisuma
4	Exercise physiology 2: Physiological adaptations during exercise	Thurs 5 Mar 26 13.00-15.00	2		4	1, 2, 3	Group discussion	Rubric score (discussion)	Assoc. Prof. Sorachai Srisuma; Assoc. Prof. Chantacha Sitticharoon; Lecturer Kanat Chanthongdee; Lecturer Thanus Teeratitayang-gool
5	Pregnancy physiology 1: Hormonal changes during pregnancy and birth	Mon 9 Mar 26 13.00-14.00	1		2	1	Lecture, interactive Q&A	In-class Q&A	Assoc. Prof. Chantacha Sitticharoon
6	Pregnancy physiology 2: Cardiovascular changes during pregnancy	Wed 11 Mar 26 13.00-14.00	1		2	1	Lecture, interactive Q&A	In-class Q&A	Lecturer Thanus Teeratitayang-gool
7	Pregnancy physiology 3: Fetal circulation	Fri 13 Mar 26 13.00-14.00	1		2	1	Lecture, interactive Q&A	In-class Q&A	Assoc. Prof. Panapat Uawithya
8	Aging & Frailty 1: Hormonal and metabolic changes	Mon 16 Mar 26 13.00-14.00	1		2	1, 2	Lecture, interactive Q&A	In-class Q&A	Assoc. Prof. Chantacha Sitticharoon

No.	Topic	Date & Time	Hours			CLOs	Teaching & learning strategy	Assessment	Lecturers
			Lec-ture	Labo-ratory	Self-Study				
9	Q&A 1	Mon 16 Mar 26 14.00-15.00	1						Faculty
10	Aging & Frailty 2: Neuromuscular changes	Wed 18 Mar 26 13.00-16.00	3		4	1, 2	Lecture, interactive Q&A	In-class Q&A	Assist. Prof. Sompol Tapechum; Assoc. Prof. Narawut Pakaprot; Lecturer Rujapope Sutiwisesak; Lecturer Kanat Chanthongdee
11	Aging & Frailty 3: Cardiovascular and respiratory changes	Thurs 19 Mar 26 13.00-14.00	1		4	1	Lecture, interactive Q&A	In-class Q&A	Lecturer Thanus Teeratitayang-gool
12	Physiological changes according to shock, hypertension, and non-	Fri 20 Mar 26 13.00-15.00	2		4	1, 2	Lecture, interactive Q&A	In-class Q&A	Lecturer Thanus Teeratitayang-gool
13	Integrative physiology in current clinical and translational research + Take-home assignment	Thurs 26 Mar 26 13.00-14.00	1		2	3	Group discussion	Rubric score (discussion), Rubric score (assignment)	Assoc. Prof. Chantacha Sitticharoon
14	Q&A 2	Thurs 26 Mar 26 14.00-15.00	1						Faculty
15	Exam	Mon 30 Mar 26 9.00-12.00	3					Short answer	
16	Reflection/Feedback	Wed 22 April 26 10.00-12.00	2						Faculty
	Total hours of the study		14.5	1.5	29.75				

Course Assignments

Students are expected to complete assigned tasks and participate in discussions. Assignments may include take-home Exercise Physiology I laboratory reports and integrative physiology integrative physiology in current clinical and translational research.

Assessment Criteria

CLOs	Assessment	Proportion (%)
1, 2	Examination	70
1, 2, 3	Group discussion (rubric)	15
1, 2	Laboratory performance (rubric)	5
1, 2, 3	Assignment (rubric)	10

Evaluation of Laboratory performance

Topic: Exercise physiology 1: Laboratory practice Date: 4 March 2026

	3	2	1	0
Laboratory Engagement & Participation	Highly engaged; actively participates	Generally engaged; participates when prompted	Limited engagement; minimal participation	Not engaged; no participation
Performance of Laboratory Procedures	Performs procedures accurately and follows instructions consistently	Performs procedures mostly correctly with minor errors	Performs procedures with multiple errors; needs frequent clarification	Unable to perform procedures correctly even with guidance
Punctuality	On time / Early	Late ≤ 5 min	Late >5 - ≤10 min	Late >10 min or absent
Responsibility in doing the assigned tasks	Consistently responsible; Consistently completes all tasks appropriately	Generally responsible; Generally completes most tasks appropriately	Inconsistently responsible; Sometimes completes tasks appropriately	Not responsible; Rarely completes tasks appropriately

Score Absent = F, 0 = D, 1-2 = D+, 3-4 = C, 5-6 = C+, 7-8 = B, 9-10 = B+, 11-12 = A

Evaluation of Student Performance in Class Participation & Discussion

	4	3	2	1	0
How well does the student prepare for the class?	Very well-prepared, researches extra resources for the class	Studies all the assigned materials with clear understanding	Studies most of the assigned materials	Has not finished preparing for the class as assigned	Does not prepare for the class
How well does the student demonstrate knowledge and understanding of the content?	Outstanding ability to conceptualize and relate theory to practice or scenario	Comprehensive knowledge but some ability to conceptualize essential ideas	Relevant knowledge but some/limited ability to conceptualize ideas	Limited knowledge and ability to draw out relevant concepts	Lack of knowledge with lack of awareness that concept exists.
How well does the student participate the class by presenting data/asking questions/offering ideas?	Consistently and voluntarily	Frequently and voluntarily	Occasionally, marginal effort, Responses after being questioned or named	Rarely, reluctantly	Never
Punctuality	On time / Early	Late ≤ 1 min	Late >1 - ≤5 min	Late >5 - ≤10 min	Late >10 min or Absent

Score Absent = F, 0 = D, 1-2 = D+, 3-4 = C, 5-7 = C+, 8-10 = B, 11-13 = B+, 14-16 = A

Evaluation of Assignment

	3	2	1	0
Understanding of Content	Demonstrates clear and accurate understanding of key concepts; explanations are comprehensive and well-supported	Shows general understanding with minor errors or missing details	Shows limited or partial understanding; major concepts unclear	Shows little to no understanding of the assignment content

Analysis	Analysis is logical, relevant, and well-structured	Analysis may be incomplete or somewhat inconsistent	Analysis is weak or incorrect	No meaningful analysis
Completeness & Accuracy of Work	All required components completed accurately and thoroughly	Most components completed with minor inaccuracies	Some components missing or inaccurate	Work mostly incomplete or incorrect
Clarity of Communication	Writing is clear, well-organized, and easy to follow; appropriate scientific language used	Writing is generally clear with minor issues in organization or wording	Writing is unclear or poorly structured, making understanding difficult	Writing lacks clarity and organization; meaning not conveyed

Score Absent = F, 0 = D, 1-2 = D+, 3-4 = C, 5-6 = C+, 7-8 = B, 9-10 = B+, 11-12 = A

Grade scale

A-B Passing grade with passing all CLOs

C-F Non-passing grade

I-1 Retake the exam and/or complete the assigned work within one month after the exam result is announced.

I-2 Complete the assigned work and retake the new evaluation within the next semester.

I-3 Repeat the course as soon as it is offered.

Appeal Procedure

Students may appeal academic assessment results by submitting a written request to the course coordinator within 7 days of grade release. The appeal will be reviewed by the course committee according to Faculty of Medicine Siriraj Hospital academic regulations.