Course Syllabus

SIPS 534

Academic Year 2026

Department of Physiology

Faculty of Medicine Siriraj Hospital, Mahidol University

Course ID and name:	SIPS 534: Medical Respiratory Physiology
Course coordinator:	Assoc. Prof. Sorachai Srisuma, MD, PhD
Instructors:	Assoc. Prof. Sorachai Srisuma, MD, PhD
	Instructor Thaksaon Kittipassorn, MD, PhD
Credits:	1 (1-0-2) (lecture – laboratory – self-study)
Curriculum:	Masters of Science Program in Medical Physiology
Course type:	☐ Core ☑ Required ☐ Electives
Semester offering:	1/2026
Prerequisite:	None
Date of Latest Revision:	November 2, 2026

Course Description:

Respiratory system, lung volumes and ventilation, the chest and mechanics of breathing, pulmonary function tests, pulmonary circulation, blood gas transport, gas exchange, control of ventilation, respiratory system under stress

Course-level Learning Outcomes (CLOs)

Upon completion of this course, students are able to:

1. Analyze normal respiratory mechanisms and common clinical abnormalities by integrating the knowledge of mechanics of breathing, and pulmonary function tests accurately.
2. Analyze gas exchange mechanisms and ventilation control to differentiate normal respiratory functions from common clinical abnormalities accurately.
3. Formulate scientific perspectives collaboratively during clinical problem-solving discussions.

Constructive Alignment of CLOs and Program's ELOs

CLOs	ELO1	ELO2	ELO3	ELO4
1. Analyze normal respiratory mechanisms and common clinical abnormalities by integrating the knowledge of mechanics of breathing, and pulmonary function tests accurately.	R	R	R	
2. Analyze gas exchange mechanisms and ventilation control to differentiate normal respiratory functions from common clinical abnormalities accurately.	R	R	R	
3. Formulate scientific perspectives collaboratively during clinical problem-solving discussions.				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.

Course Schedule and teaching/assessment plan

No.	Date Time	Topic	Hours			CLOs	Teaching & learning strategy	Assessment (in-class)	Lecturers
			Lecture	Laboratory	Self Study				
1	M, Nov 23, 26 6.00 – 6.30 p.m.	Orientation, overview of the respiratory system	0.5	-	1	1,2	Lecture/ online live	Inclass Q&A	Dr.Sorachai
2	M, Nov 23, 26 6.30 – 7.30 p.m.	Lung volume and ventilation	1	-	2	2	Lecture/ asynchronous	Post-learning exercise	Dr.Sorachai
3	W, Nov 25, 26 6.00 – 7.00 p.m.	Static mechanics of breathing	1	-	2	1	Lecture/ asynchronous	Post-learning exercise	Dr.Thaksaon
4	W, Nov 25, 26 7.00 – 8.00 p.m.	Blood gas transport	1	-	2	2	Lecture/ asynchronous	Post-learning exercise	Dr.Sorachai
5	F, Nov 27, 26 6.00 – 7.00 p.m.	Dynamic mechanics of breathing	1	-	2	1	Lecture/ asynchronous	Post-learning exercise	Dr.Thaksaon
6	M, Nov 30, 26 6.00 – 7.00 p.m.	Pulmonary circulation and gas diffusion	1	-	2	2	Lecture/ asynchronous	Post-learning exercise	Dr.Sorachai
7	M, Nov 30, 26 7.00 – 8.00 p.m.	Control of ventilation	1	-	2	2	Lecture/ asynchronous	Post-learning exercise	Dr.Sorachai
8	W, Dec 2, 26 6.00 – 7.30 p.m.	Discussion 1: The chest and mechanics of breathing 1	1.5	-	3	1,3	Collaborative Discussion / Online Live *(Ethical Gen-AI search tool integration enabled)*	Performance rubric	Dr.Thaksaon
9	F, Dec 4, 26 6.00 – 7.00 p.m.	Basic pulmonary function tests	1	-	2	1	Lecture/ online live	Post-learning exercise	Dr.Thaksaon

No.	Date Time	Topic	Hours			CLOs	Teaching & learning strategy	Assessment (in-class)	Lecturers
			Lecture	Laboratory	Self Study				
10	T, Dec 8, 26 6.00 – 7.00 p.m.	Ventilation and perfusion relationships	1	-	2	2	Lecture/ asynchronous	Post-learning exercise	Dr.Sorachai
11	W, Dec 9, 26 6.00 – 7.30 p.m.	Discussion 2: The chest and mechanics of breathing 2	1.5	-	3	1,3	Collaborative Discussion / Online Live *(Ethical Gen-AI search tool integration enabled)*	Performance rubric	Dr.Thaksaon
12	F, Dec 11, 26 6.00 – 7.30 p.m.	Discussion 3: Integrated responses in respiratory system	1.5		3	1,2,3	Data-driven Active Learning / Online Live (Clinical reasoning from diagnostic data)	Performance rubric	Dr.Sorachai
13	M, Dec 14, 26 6.00 – 7.30 p.m.	Discussion 4: Analysis of pulmonary function measurements	1.5	-	3	1,3	Data-driven Active Learning / Online Live (Clinical profiling analysis)	Performance rubric	Dr.Thaksaon
14	W, Dec 16, 26 6.00 – 7.30 p.m.	Discussion 5: Respiratory system under stress	1.5		3	1,2,3	Collaborative Discussion / Online Live *(Clinical simulation scenario)*	Performance rubric	Dr.Thaksaon
15	Th, Dec 17, 26 5.00 – 6.00 p.m.	Q&A					Synchronous/ online live		Faculty
16	Sat, Dec 19, 26 9.00 a.m. – 12.00 p.m.	Closed-book On-site Summative examination					Written and Case-based Assessment		

No.	Date Time	Topic	Hours			CLOs	Teaching & learning strategy	Assessment (in-class)	Lecturers
			Lecture	Laboratory	Self Study				
17	Thu, Jan 7, 27 5.00 – 6.00 p.m.	Reflection & Feedback					Synchronous/ online live		Faculty
		Total hours of the study	16	-	32.0				

Course Assignments

- In-class post-learning exercise (administered across 8.5 asynchronous/synchronous lectures)
- Participation in collaborative scientific discussion (assessed with a rubric across five interactive sessions.

Assessment Criteria & Grade Distribution

GRADE DISTRIBUTION

65%	Summative examination (assesses CLO1 and CLO2)
35%	Performance in discussion classes (assesses CLO3 via Concise Rubric over 5 sessions)

Note: Each individual CLO must achieve a minimum score of 50% to be considered passed.

Class Participation and Discussion Rubric

Scoring Scale: 5 = Excellent | 4 = Good | 3 = Satisfactory | 2 = Developing | 1 = Unacceptable

	5	4	3	2	1
1. Ideation & Engagement *Measurable Action*: Volunteering & initiating	**Initiates** scientific ideas or perspectives voluntarily and frequently.	**Offers** relevant ideas or insights voluntarily when prompted.	**Contributes** answers or ideas **only** when directly called upon.	**Rarely contributes**; remains passive during group work.	**Fails to contribute** any ideas or refuses to answer.
2. Scientific Quality *Measurable Action*: Analyzing & backing with data	**Analyzes** cases deeply and **justifies** views with physiological data.	**Explains** relevant mechanisms accurately and correctly.	**States** basic facts from memory without mechanical depth.	**Provides** irrelevant info that deviates from the clinical topic.	**Shows no** scientific substance or pre-class preparation.
3. Professionalism & Collaborative spirit *Measurable Action:* Responding & building on ideas	Actively and respectfully **pays attention** and **builds on** peers/instructor's ideas to move discussion forward.	**Pays attention** and **responds** to peers/instructor appropriately and politely.	**Listens** but **occasionally loses focus** or interrupts others.	**Disengages** from the group (e.g., uses mobile devices).	**Fails to pay attention; disrupts** the class or displays disrespectful behavior.

GRADE SCALE

A	80% to 100%, with all CLOs passed (minimum 50% each)
B+	65% to <80%, with all CLOs passed (minimum 50% each)
B	50% to <65%, with all CLOs passed (minimum 50% each)
F	< 50%
	Actions Based on CLO Status:
I-1	Retake the exam and/or complete the assigned work within one month after the exam results are announced, if at least one CLO (CLO1-3) is failed.
I-2	Complete the assigned work and undergo a new evaluation within the next semester if all CLOs are failed.
I-3	Repeat the course when it is next offered, if all CLOs are failed.

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.