

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: September 28, 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	Topic	Hours			CLOs	Teaching & learning strategy	Assessment (in-class)	Lecturers
	Time		Lecture	Laboratory	Self Study				
1	M, Sep 28, 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, Sep 28, 26 6.30 – 7.30 p.m.	Lung volume and ventilation	1	-	2	2	Lecture/ asynchronous	Post-learning exercise	Dr.Sorachai
3	W, Sep 30, 26 6.00 – 7.00 p.m.	Static mechanics of breathing	1	-	2	1	Lecture/ asynchronous	Post-learning exercise	Dr.Thaksaon
4	W, Sep 30, 26 7.00 – 8.00 p.m.	Blood gas transport	1	-	2	2	Lecture/ asynchronous	Post-learning exercise	Dr.Sorachai
5	F, Oct 2, 26 6.00 – 7.00 p.m.	Dynamic mechanics of breathing	1	-	2	1	Lecture/ asynchronous	Post-learning exercise	Dr.Thaksaon
6	M, Oct 5, 26 6.00 – 7.00 p.m.	Pulmonary circulation and gas diffusion	1	-	2	2	Lecture/ asynchronous	Post-learning exercise	Dr.Sorachai
7	M, Oct 5, 26 7.00 – 8.00 p.m.	Control of ventilation	1	-	2	2	Lecture/ asynchronous	Post-learning exercise	Dr.Sorachai
8	W, Oct 7, 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 (<i>Ethical Gen-AI search tool integration enabled</i>)	Performance rubric	Dr.Thaksaon
9	F, Oct 9, 26 6.00 – 7.00 p.m.	Basic pulmonary function tests	1	-	2	1	Lecture/ online live	Post-learning exercise	Dr.Thaksaon

10	M, Oct 12, 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 (<i>Ethical Gen-AI search tool integration enabled</i>)	Performance rubric	Dr.Thaksaon
11	W, Oct 14, 26 6.00 – 7.00 p.m.	Ventilation and perfusion relationships	1	-	2	2	Lecture/ asynchronous	Post-learning exercise	Dr.Sorachai
12	F, Oct 16, 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, Oct 19, 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, Oct 21, 26 6.00 – 7.30 p.m.	Discussion 5: Respiratory system under stress	1.5		3	1,2,3	Collaborative Discussion / Online Live (<i>Clinical simulation scenario</i>)	Performance rubric	Dr.Thaksaon
15	Th, Oct 22, 26 5.00 – 6.00 p.m.	Q&A					Synchronous		Faculty
15	Sat, Oct 24, 26 9.00 a.m. – 12.00 p.m.	Closed-book On-site Summative examination					Written and Case-based Assessment		
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 <i>Measurable Action:</i> 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 <i>Measurable Action:</i> 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 <i>Measurable Action:</i> 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.