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THE UNIVERSITY OF BRITISH COLUMBIA

School of Health and Exercise Sciences

HES 454 - Clinical Exercise Physiology – Applications in Chronic Conditions: Respiratory Disease – Winter Term 1, 2026

We respectfully acknowledge the Syilx Okanagan Nation and their peoples, in whose traditional, ancestral, unceded territory UBC Okanagan is situated.

Instructor: Neil Eves *(he/him/his)*
Office: RHS 121
Department: School of Health and Exercise Sciences
Office Hours: By Appointment

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Academic Calendar Entry

Clinical considerations of respiratory diseases. Safe and effective implementation of exercise programs for people with respiratory disease. Critical review of evidence, standards and recommendations for the use of exercise in the management and prevention of respiratory disease. [3-0-0] *Prerequisites:* HES 351 and registration limited to students in the Clinical Exercise Physiology concentration of the B.H.E.S.

Class Times

Lecture: Wednesday & Friday: 2:00pm – 3:30pm (ART 203)

Course Format

- The course uses a lecture-based format to achieve the learning objectives, in conjunction with case-study assignments, group-based discussion and in-class writing activities.
- **Total contact hours**: 3 hours/week (Lecture)

Course Overview, Content, and Objectives

This course will explore the structures, functions, regulation and adaptation of the respiratory system in health and chronic disease. The physiologic responses of the respiratory system to acute and chronic exercise and respiratory disease states will be investigated. Furthermore, the etiology, diagnosis and clinical care of individuals with respiratory and pulmonary conditions will be explored as well as the evidence and application of training prescriptions, pharmacologic management and rehabilitation programs in the prevention, management and treatment of respiratory disease.

The learning objectives are to:

- Advance understanding of the physiology of the respiratory system and the influence of exercise on respiratory physiology.
- Introduce students to the pathophysiology and etiology of respiratory disease, the diagnostic, medical management and clinical care of individuals with respiratory disease and the role of the exercise physiologist in the treatment and care of individuals with chronic respiratory conditions.
- Support students in learning and applying physiological concepts as well as guidelines, recommendations and the current evidence for exercise to improve the health and wellbeing of individuals with respiratory disease.

Primary Learning Outcomes

By the end of this course successful students will be able to:

1. Describe key characteristics of respiratory disease (e.g., COPD, Asthma, IPF, CF, PAH), including etiology, prevalence, pathophysiological basis, common symptoms, comorbidities, and disease progression.
2. Demonstrate understanding of common disease-specific diagnostic tests, treatments and interventions, functional limitations, contraindications to exercise and patient care plans and how each of these affect exercise prescription in this population
3. Develop safe and effective clinical exercise assessment strategies, and evaluate, analyze and communicate relevant test results.
4. Design a safe and effective exercise prescription, based on relevant assessments results, and describe an appropriate implementation of this prescription in individuals with respiratory disease, including consideration of risks, equipment, environmental needs, emergency management and effective monitoring strategies.
5. Examine current standards, guidelines and the role of the clinical exercise physiologist within the integrated care team of this patient population and critically appraise health and exercise research in respiratory disease.

Evaluation Components and Grading

Assignment 1	10%
Assignment 2	10%
Pulmonary Function Interpretation	10%
Mid-Term Exam	20%
Exercise Prescription Project	20%
Final Exam	30%

1) Assignments 1 and 2 (20%).

These assignments will be in the form of specific questions that assess understanding of the physiology provided in the lectures preceding each assignment. Assignments will focus on your understanding of a specific respiratory condition, the underlying pathophysiology etc. You will have 7-10 days to complete each assignment and they should be **submitted online before the class on the date stated in the course outline and Canvas**. The two assignments are wort 20% (i.e. 10% each). More details will be provided when each assignment is posted.

2) Pulmonary Function Test Interpretation (10%)

This will be an in-class assignment performed after completing the pulmonary function interpretation module. You will be given 15 minutes at the start of the next class (October 14th) to interpret a pulmonary function test provided to you.

3) Exercise Prescription. Project (20%).

This project will be a clinical case involving a patient with a respiratory disease. Students will assess the patient's medical history, CPET and PFT results, and identify key clinical considerations. Based on current guidelines and evidence-based practice, students will develop a tailored exercise prescription and justify their recommendations. The case study will emphasize clinical reasoning, safe program design, and the integration of physiological principles to improve the patient's condition. Date of submission will be determined when the final exam date is known.

4) Mid-Term Exam (20%).

This exam will be written during class time on Wednesday 21st October will be 80 min in duration. The format will be short-answer questions. More details will be given in class before the exam.

5) Final examination (30%).

This examination will be written on the time designated by the University. It will be a 2.5-hour exam and will cover all course material **not** covered in the midterm.

Required Readings

John B. West, MD, PhD. and Andrew M. Luks M.D. West's Respiratory Physiology - The Essentials. Wolters Kluwer, 11th Edition, 2020.

Other Suggested Texts and Readings:

John B. West, MD, PhD. Pulmonary Pathophysiology: The Essentials. Wolters Kluwer, 9th Edition, 2017.

Spruit et al., An Official American Thoracic Society/European Respiratory Society Statement: Key Concepts and Advances in Pulmonary Rehabilitation. Am J Respir Crit Care Med. 188(8), e13–e64, 2013.

Rochester et al. An Official American Thoracic Society/European Respiratory Society Policy Statement: Enhancing Implementation, Use, and Delivery of Pulmonary Rehabilitation. Am J Respir Crit Care Med 192(11), 1373–1386, 2015.

Additional readings to supplement material may be presented throughout the class on specific topics not covered in the textbook. Additional readings can also be suggested on request for clarification of specific topics.

Online Resources: Lectures by Prof. John West associated with these textbooks are also available online on the UC San Diego website: https://pulmonary.ucsd.edu/research/labs-centers/west/video-lectures.html. Other resources will also be provided during the class.

Lecture Materials:

Required readings for future topics will be announced in class and put on Canvas at the end of the previous module. Lecture notes will be posted before each lecture. For each week's lecture recordings, I will post at the end of each week. Providing lecture notes and recordings is a privilege and is not a requirement of teaching at UBC-O. As such, please be respectful if on occasion I am late, otherwise I will withdraw this privilege for all students.

Final Examinations:

The examination period for Term 1 is December 12th-22nd. Except in the case of examination clashes and hardships (three or more formal examinations scheduled within a 24-hour period) or unforeseen events, students will be permitted to apply for our-of-time final examinations only if they are representing the University, the province or the country in a competition or performance; serving the Canadian military observing a religious rite; working to support themselves or their family; or caring for a family member. Unforeseen events include (but may not be limited to) the following: ill health or other personal challenges that arise during a term and changes in the requirements of an ongoing job. Further information can be found under Policies and Regulation in the *Okanagan Academic Calendar* http://www.calendar.ubc.ca/okanagan/index.cmf?tree=3,48,0,0

Policies and Regulations

UBC Values

UBC creates an exceptional learning environment that fosters global citizenship, advances a civil and sustainable society, and supports outstanding research to serve the people of British Columbia, Canada, and the world. UBC's core values are excellence, integrity, respect, academic freedom, and accountability.

Visit UBC Okanagan's Academic Calendar for a list of campus-wide regulations and policies, as well as term dates and deadlines.

Resources to Support Student Success

Visit the Student Support and Resources page to find one-on-one help or explore resources to support your experience at UBC Okanagan, as well as many other campus services available to all students.

Other Course Policies:

Academic integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating usually result in a failing grade or mark of zero on the assignment or in the course. Careful records are kept to monitor and prevent recidivism.

A more detailed description of academic integrity, including the University's policies and procedures, may be found in the Academic Calendar.

Academic misconduct

The academic enterprise is founded on honesty, civility, and integrity. Violations of academic integrity (i.e., academic misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred for consideration for academic discipline. Careful records are kept to monitor and prevent recurrences. Any instance of cheating or taking credit for someone else's work, whether intentionally or unintentionally, can and often will result in at minimum a grade of zero for the assignment, and these cases will be reported to the Head of the Department and Associate Dean Academic of the Faculty.

Do not use generative artificial intelligence (AI): The use of generative AI tools, including ChatGPT and other similar tools, to complete or support the completion of any form of assignment or assessment in this course is not allowed and would be considered academic misconduct. Learn more through the Generative AI website.

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Tentative Course Schedule

Week #	Date (Wed/Fri)	Lesson Topic	
1	09-Sep-2026	Epidemiology, Pathophysiology and Treatment of Resp Conditions	
	11-Sep-2026	Epidemiology, Pathophysiology and Treatment of Resp Conditions	
2	16-Sep-2026	Structure and Function of the Pulmonary System	
	18-Sep-2026	Structure and Function of the Pulmonary System	
3	23-Sep-2026	Alveolar Ventilation and Dead Space	
	25-Sep-2026	Influence of Different Respiratory Conditions on Lung Mechanics	
4	30-Sep-2026	**Day Off - Truth and Reconciliation**	
	02-Oct-2026	Work of Breathing – Effect of Exercise and Respiratory Disease	Assignment #1 - Due
5	07-Oct-2026	Pulmonary Function Testing and Interpretation	
	09-Oct-2026	Pulmonary Function Testing and Interpretation	
6	14-Oct-2026	Gas Exchange and Transport in Respiratory Disease	In Class PFT - Interp
	16-Oct-2026	Gas Exchange and Transport in Respiratory Disease	
7	21-Oct-2026	**Mid Term Exam**	**Midterm Exam**
	23-Oct-2026	Pulmonary Circulation and Pulmonary Hypertension	
8	28-Oct-2026	Pulmonary Circulation and Pulmonary Hypertension	
	30-Oct-2026	Control of Breathing	
9	04-Nov-2026	Acid Base Balance	
	06-Nov-2026	**IPE Workshop**	
10	11-Nov-2026	Reading Break	
	13-Nov-2026	Reading Break	
11	18-Nov-2026	Respiratory Responses to Exercise	
	20-Nov-2026	Respiratory Responses to Exercise	
12	25-Nov-2026	Exertional Dyspnea – Mechanisms and Management	
	27-Nov-2026	CPET Testing and Interpretation for Respiratory Disease	Assignment #2 - Due
13	02-Dec-2026	Linking Testing to Training for Respiratory Disease	
	04-Dec-2026	Ex Prescription for Respiratory Disease	
14	09-Dec-2026	Ex Prescription for Respiratory Disease	
Final Exam Period		**12th – 22nd -December 2026**	**Project - Due**

Resources to Support Student Success:

UBC Okanagan Disability Resource Centre

The DRC facilitates disability-related accommodations and programming initiatives to remove barriers for students with disabilities and ongoing medical conditions. If you require academic accommodations to achieve the objectives of a course please contact the DRC at:
Email: drc.questions@ubc.ca
Web: www.students.ok.ubc.ca/drc

UBC Okanagan Equity and Inclusion Office

Through leadership, vision, and collaborative action, the Equity & Inclusion Office (EIO) develops action strategies in support of efforts to embed equity and inclusion in the daily operations across the campus. The EIO provides education and training from cultivating respectful, inclusive spaces and communities to understanding unconscious/implicit bias and its operation within in campus environments. UBC Policy 3 prohibits discrimination and harassment on the basis of BC's Human Rights Code. If you require assistance related to an issue of equity, educational programs, discrimination or harassment please contact the EIO.
Email: equity.ubco@ubc.ca
Web: www.equity.ok.ubc.ca

Student Wellness

At UBC Okanagan health services to students are provided by Student Wellness. Nurses, physicians and counsellors provide health care and counselling related to physical health, emotional/mental health and sexual/reproductive health concerns. As well, health promotion, education and research activities are provided to the campus community. If you require assistance with your health, please contact Student Wellness for more information or to book an appointment.
Email: healthwellness.okanagan@ubc.ca
Web: www.students.ok.ubc.ca/health-wellness

Office of the Ombudperson

The Office of the Ombudsperson for Students is an independent, confidential and impartial resource to ensure students are treated fairly. The Ombuds Office helps students navigate campus-related fairness concerns. They work with UBC community members individually and at the systemic level to ensure students are treated fairly and can learn, work and live in a fair, equitable and respectful environment. Ombuds helps students gain clarity on UBC policies and procedures, explore options, identify next steps, recommend resources, plan strategies and receive objective feedback to promote constructive problem solving. If you require assistance, please feel free to reach out for more information or to arrange an appointment.
Email: ombuds.office.ok@ubc.ca
Web: www.ombudsoffice.ubc.ca

Student Learning Hub

The Student Learning Hub is your go-to resource for free math, science, writing, and language learning support. The Hub welcomes undergraduate students from all disciplines and year levels to access a range of supports that include **tutoring in math, sciences, languages, and writing, as well as help with study skills and learning strategies**. Students are encouraged to visit often and early to build the skills, strategies and behaviors that are essential to being a confident and independent learner. For more information, please visit the Hub's website.
Email: learning.hub@ubc.ca
Web: www.students.ok.ubc.ca/slh

The Global Engagement Office

The Global Engagement Office provides advising and resources to assist International students in navigating immigration, health insurance, and settlement matters, as well as opportunities for intercultural learning, and resources for Go Global experiences available to all UBC Okanagan students, and more.
Email: ubco.global@ubc.ca
Web: www.students.ok.ubc.ca/global-engagement-office/

Safewalk

Don't want to walk alone? Not too sure how to get somewhere on campus? Call Safewalk at **250-807-8076**. Web: www.security.ok.ubc.ca