



**School of Health and Exercise Sciences
HES 305: Exercise Physiology II | Winter Term 1, 2023**

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

Instructor: John Sasso (*he/him/his*) **Contact:** via Canvas Message

Office: ART 163 **Email:** john.sasso@ubc.ca

Faculty: Faculty of Health and Social Development

Department: School of Health and Exercise Sciences

Teaching Assistants

- Victoria Bouck vab@mail.ubc.ca
- Nique Bruce cbruc702@mail.ubc.ca
- Lisa Ha phuonglisa.ha@ubc.ca
- Alex Paish adpaish@mail.ubc.ca
- Kate Sansum kate.sansum@ubc.ca

Office Hours:

Thursdays 11:00-12:30pm

Students may attend office hours in-person (ART 163) *or* via Zoom (*weekly link will be on Canvas*)

Academic Calendar Entry

Oxygen transport and vascular response during exercise in humans. Regulation and adaptation of the cardiovascular and respiratory systems during exercise. [3-2-0] 3 Credits.

Prerequisite: HMKN 200 (*or HES 105*)

Course Format

This course combines both lecture and laboratory investigation to achieve the learning objectives. The lectures will focus on the concepts and principles underpinning the study of exercise physiology. Laboratory activities specifically address the methodology of measurement and assessment of physiological systems during exercise and environmental stresses and provide opportunities for applying and integrating course concepts. In addition, laboratory activities focus on clinical standards of measurement. Active participation for course activities including class discussions and contributions to laboratory sessions is encouraged, and will best support student learning.

Lecture: FIP 204 (*all times in Pacific Daylight/Standard Time; local time Kelowna, BC*):

- **Tuesdays & Thursdays: 9:30am – 11:00am**

Lab: UCH 110 (*all times in Pacific Daylight/Standard Time; local time Kelowna, BC*):

LAB 01: Mondays 8:00am-10:00am	LAB 06: Mondays 6:00pm-8:00pm
LAB 02: Mondays 10:00am-12:00pm	LAB 07: Tuesdays 11:00am-1:00pm
LAB 03: Mondays 12:00pm-2:00pm	LAB 08: Tuesdays 2:00pm-4:00pm
LAB 04: Mondays 2:00pm-4:00pm	LAB 09: Wednesdays 11:00am-1:00pm
LAB 05: Mondays 4:00pm-6:00pm	LAB 10: Wednesdays 5:00pm-7:00pm

Course Delivery

This course will be conducted in an **in-person format**. It is recommended that students **attend all components** of the course (and expected that students attend all laboratory sessions) in order to best support learning. Sessions will not be live-streamed. Some course activities will include pre-recorded videos or external resources, but instruction will be primarily in-person, unless extenuating circumstances warrant a modification.

- **Course Lectures** will be delivered **in-person** at the locations and times specified for this course. It is recommended to attend lecture to support student learning, unless illness or other extenuating circumstance precludes their attendance. If students are sick, we ask that they not to attend campus, per UBCO policy. Lectures will be recorded and uploaded to the course Canvas website; students may review sessions as needed. Students are encouraged to attend class whenever reasonably possible, to have questions answered and engage in collaborative, active learning in the in-person lecture format, which will support their understanding of course content. For any *asynchronous* material (pre-recorded and posted to Canvas the week of the lecture), students are expected to review the material and complete any associated activities (as a check for understanding) prior to participating in any *in-person* components of the lecture.



- Laboratory experiential learning sessions** will be conducted **in-person** at the locations and times specified for each student’s registered laboratory section. Attendance at students’ specific registered lab time is required except in cases of illness or extenuating circumstances. If students are unable to attend their laboratory session, they must contact their course instructor and teaching assistant as soon as possible to either determine a suitable alternative, or be excused from the session (laboratory sessions will not be recorded). Laboratory sessions will involve practical laboratory experiences and experiments (*designed to explore course topics using laboratory measurement and activities*), as well as tutorial & application sessions (*designed to use coordinated activities and student-guided exploration of topics to learn scientific communication and extend student learning*).

Course Overview, Content, and Objectives

Through lecture and laboratory experiences the student will gain an understanding of how human body systems are affected by acute and chronic exercise and environmental stresses. Specifically, this course will address gas exchange, transport, and vascular responses during exercise and includes the regulation and adaptation of the cardiovascular and respiratory systems during exercise and environmental stresses. Adaptations of the neuromuscular system will be discussed through special attention to the application of physiological principles of muscular exercise and physical conditioning.

Learning Outcomes

Upon successful completion of this course, students should be able to:

- Describe how human physiological systems (i.e., metabolic, cardiovascular, respiratory, neuromuscular) are controlled and how they respond to the demands of exercise and environmental stresses (e.g., thermal, diving, altitude).
- Understand how multiple systems work in an integrative manner to maintain cellular homeostasis under fatiguing conditions, during exercise and environmental stresses.
- Demonstrate understanding of physiological measurements during acute exercise and environmental stresses in a laboratory setting.
- Integrate and apply the cardio-respiratory physiological principles of the “healthy human” to other stresses including disease, travel to high altitude, and diving.
- Write assignments using communication skills necessary for scientific inquiry.

Evaluation Criteria and Grading

- Course Quizzes (2 x 5%)	10%	[L01, L02, L03, L04]
- Lab Assignments (2 x 10%)	20%	[L01, L02, L03, L04, L05]
- Midterm Exam	15%	[L01, L02, L03, L04]
- Final Lab Report	20%	[L01, L02, L03, L04, L05]
- Final Exam	35%	[L01, L02, L03, L04, L05]

Further evaluation details outlined below

Required Readings and Videos

- Readings from relevant literature will be provided throughout the course for lecture and laboratory components. These will be posted to Canvas according to the class schedule.

Recommended Readings

- McArdle, W., Katch, F., & Katch, V. (2022). *Exercise physiology: Nutrition, energy, and human performance* (9th ed.). Wolters Kluwer Medical.
 - Online (ebook) or Hardcopy available; Editions 7th-9th acceptable
- Other recommended readings and recommended supplementary material will be posted through the term



Course Schedule (dates and topics subject to change)

Week of Classes	Class #	Day	Date	Topic	Lab #	Lab Topic	Assessments
1	1	T	05-Sep-23	Course Introduction, Stress Physiology		NO LAB	
	2	Th	07-Sep-23	Neuromuscular Physiology			
2	3	T	12-Sep-23	Neuromuscular Physiology	1	Intro, Screening, Baseline Data + SciReporting 1	
	4	Th	14-Sep-23	Neuromuscular Physiology			
3	5	T	19-Sep-23	Neuromuscular Physiology	2	EMG & Fatigue	Assign #1
	6	Th	21-Sep-23	Metabolic Physiology			
4	7	T	26-Sep-23	Metabolic Physiology	3	Scientific Reporting 2 + Threshold Analysis	
	8	Th	28-Sep-23	Metabolic Physiology			
5	9	T	03-Oct-23	Metabolic Physiology		NO LAB	Quiz
	10	Th	05-Oct-23	Metabolic Physiology			
6	11	T	10-Oct-23	Respiratory Physiology		NO LAB	
	12	Th	12-Oct-23	Respiratory Physiology			
7	13	T	17-Oct-23	Respiratory Physiology	4	Resting Metabolic Rate & Incremental Exercise 1	Midterm
	14	Th	19-Oct-23	Midterm			
8	15	T	24-Oct-23	Cardiovascular Physiology	5	Scientific reporting 3 + RMR & Incremental Exercise 2	
	16	Th	26-Oct-23	Cardiovascular Physiology			
9	17	T	31-Oct-23	Cardiovascular Physiology	6	Recovery from Max Exercise	Quiz
	18	Th	02-Nov-23	Cardiovascular Physiology + Review			
10	19	T	07-Nov-23	Environmental Physiology	7	Cardiovascular Drift Part 1	Assign #2
	20	Th	09-Nov-23	Environmental Physiology			
11		T	14-Nov-23	Midterm Break - No Class		NO LAB	
		Th	16-Nov-23	Midterm Break - No Class			
12	21	T	21-Nov-23	Environmental Physiology	8	Cardiovascular Drift Part 2	
	22	Th	23-Nov-23	Endocrine & Immune Physiology			
13	23	T	28-Nov-23	Endocrine & Immune Physiology	9	Hypoxia	Lab Report
	24	Th	30-Nov-23	Endocrine & Immune Physiology			
14	25	T	05-Dec-23	REVIEW		Review (To Be Confirmed)	
	26	Th	07-Dec-23	REVIEW			
			Dec 10 - 21	Exam Period			Final Exam

Detailed Assessment Overview:

This section provides a more detailed description of course assessments. Each assessment will have further information provided during the term, and outlined on the course Canvas site, including instructions, due dates and specific outcomes, where appropriate.

LABORATORY COMPONENT (40%)

- i. **Attendance** at all registered Lab Sessions is mandatory (Pass/Fail); due to the collaborative nature of Lab Sessions, students must also not be late to sessions (lateness will constitute an absence). Any absences must be expressly permitted by the course instructor and abide by the policies for Health & Exercise Sciences for documentation.
- ii. **Scientific Reporting Assignments (SciReporting)** [2 x 10% = **20%**]
 - o Using data from the Lab Experiment sessions, as well as the frameworks from the Scientific Reporting sessions, students will be asked to complete individual assessments. Each assignment will explore elements of scientific reporting. These assignments will include creating appropriate research questions and ethical study conduct, analyzing study results and discussing experimental findings and critiquing research.
- iii. **Final Laboratory Report** [1 x 20% = **20%**]
 - o As a culminating assessment for the Laboratory Component, students will investigate a laboratory experiment performed through the term. Students develop a study question, create a hypothesis and rationale, describe the study methodology, collect and analyze experimental results and discuss the findings. Students will submit a complete scientific Lab Report. More details will be available regarding this project during the term.



LECTURE COMPONENT (60%)

i. **Quizzes** (2 x 5% = 10%)

Two (2) individually-written assessments based on lecture and laboratory information, assessed via multiple choice, matching, true-false, fill-in-the-blank and short answer questions, designed to support learning and understanding of lesson material throughout the course. Quizzes will be submitted via Canvas and must be completed individually, without discussion, collaboration or use of unauthorized resources/materials (more information will be available through the term).

Due Dates: *Weeks of October 2-5 and October 16-19, 2023*

ii. **Midterm** (15%)

An individually-written assessments based on lecture and laboratory information, assessed via multiple choice, matching, true-false, fill-in-the-blank, short answer and long answer questions, designed to support learning and understanding of lesson material throughout the course. The midterm must be completed individually, without discussion, collaboration or use of unauthorized resources/materials (more information will be available through the term).

Due Dates: *October 19, 2023*

iii. **Final Exam** (35%)

This assessment will consist of multiple choice, true/false, matching, fill-in-the-blank, short answer and long answer questions. It will cover all topics from the course (cumulative), including material not yet evaluated in other assessments, and will be delivered during the assigned Final Exam time period. The Final Exam must be completed individually, without discussion, collaboration or use of unauthorized resources (*more information will be available during term*).

Due Date: *Exam Period (TBD)*

Late policy

Assignment deadlines are established to support your continued sequential and progressive learning. At the same time, we acknowledge that there are sometimes unforeseen circumstances that preclude our ability to meet those deadlines. Please inform your instructor of any late submissions, or to seek approval for an extension if needed; refer to the policies for the School of Health & Exercise Sciences (including Self-Declaration policy). With respect to these principles, the following policies apply to these evaluations:

- Quizzes will not be accepted after the due date/time (*a mark of 0 for that quiz will be given*)
- Assignments (Projects) will be subject to a late penalty of 5% for the first 24 hours and 10% per day up to 7 days. Assignments submitted after 7 days will be given a grade of zero.
- Regrading of marked assignments will only be performed up to 10 days after an assessment has been marked, and after a reasonable course of action has been taken (e.g., reviewed the assignment rubric, discussed with the instructor, reflected on the answers, support for alternative marking) at which point another teaching member or third party will mark the assignment.

Missed exam policy

If students anticipate the need for rescheduling of a midterm ahead of time (for a reason outlined in the SHES policies), they must make a request to their instructor as early as possible (at least 2 weeks prior). If a midterm is *missed* for medical or other reasons outlined in the SHES policies, students must inform their instructor and request a new date for writing as soon as reasonably possible. The instructor will work with you to determine the best course of action. If you have missed an assessment, it is important that you do not discuss the missed exam with students who have written the exam, as this constitutes a form of Academic Misconduct. Please note, no re-writes (writing an assessment more than once) will be permitted and requests for moving of a midterm date may or may not be approved. Final exam is addressed below.

Missed Activity Policy:

Throughout the term, students will be asked to participate as a community of learners, contributing to the ongoing evolution of course material, of peer learning, of interpersonal discourse and peer feedback. Class participation is especially valuable during practical laboratory sessions, where students will work together



to conduct activities and experiments to promote learning. Therefore, full attendance and active participation in laboratory activities is required for course completion (exceptions may be granted for students with excused absences). A grade of Pass / Fail will be given for attendance and active participation (e.g., volunteering as a participant, leading measurements, contributing to group discussions, completion of lab activities, safe and professional conduct) in labs through the term. *There is a 10% deduction from the total lab mark for every unexcused absence to laboratory sessions.* If you are sick or have another unforeseen issue arise, please contact your TA and Instructor as soon as possible so that other accommodations may be made.

Generative Artificial Intelligence Use in this Course:

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.

Passing/Grading Criteria

****You must pass both the lab and lecture components of a course to receive a passing grade in this course.** If you happen to fail one of these components, yet your total grade is still above 50%, then your final grade will be 49%. Individual assessments will have their own grading rubrics and criteria, please ensure you understand their policies through the term.

Additional UBC-Okanagan Policies

Final Examinations

You can find the [Senate-approved term and examination dates here](#). Except in the case of examination clashes and hardships (three or more formal examinations scheduled within a 27-hour period) or unforeseen events, students will be permitted to apply for out-of-time final examinations only if they are representing the University, the province, or the country in a competition or performance; serving in 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 on Academic Concession can be found under Policies and Regulation in the Okanagan Academic Calendar <http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,48,0,0>

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 at:

<http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,54,111,0>

Grading Practices

Faculties, departments, and schools reserve the right to scale grades in order to maintain equity among sections and conformity to University, faculty, department, or school norms. Students should therefore note that an unofficial grade given by an instructor might be changed by the faculty, department, or school. Grades are not official until they appear on a student's academic record.

<http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,41,90,1014>



Student Service Resources

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:

UNC 215 250.807.8053
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.

UNC 325H 250.807.9291
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.

UNC 337 250.807.9270
email: healthwellness.okanagan@ubc.ca
Web: www.students.ok.ubc.ca/health-wellness

Office of the Ombudperson

The Office of the Ombudperson 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.

UNC 328 250.807.9818
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.

LIB 237 250.807.8491
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.

UNC 227
email: ubco.global@ubc.ca
Web: www.students.ok.ubc.ca/global-engagement-office/

© Copyright Statement

All materials of this course (course handouts, lecture slides, assessments, course readings, etc.) are the intellectual property of the Course Instructor or licensed to be used in this course by the copyright owner. Redistribution of these materials by any means without permission of the copyright holder(s) constitutes a breach of copyright and may lead to academic discipline.

SAFEWALK

Don't want to walk alone at night? Not too sure how to get somewhere on campus? Call Safewalk at 250-807-8076.

For more information, see: www.security.ok.ubc.ca