



## Land Acknowledgement

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

This course and the BHES program will provide multiple opportunities to reflect on what it means to work, study, and live here in a good way. Throughout your degree, I encourage you to take every opportunity - in and out of class - to learn about Syilx history and culture and about how colonialism has impacted Indigenous people here and across Canada.

Staff and faculty in Health & Exercise Sciences are committed to decolonizing our curriculum and to providing an education that prepares you to work towards health equity for Indigenous people.

We invite you to support our efforts by engaging with relevant learning activities, by understanding that we will sometimes make mistakes, and by holding us accountable when we do.

## HMKN 105: Exercise Physiology I

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**Instructor:** Dr. Meaghan MacNutt, [meaghan.macnutt@ubc.ca](mailto:meaghan.macnutt@ubc.ca)

**Duration:** 2023 W2: Jan 8 – Apr 11, 2024

**Class Time:** Tu/Th 11am-1230pm (*except Reading Week*)

**Class Location:** FIP 204

**Labs:** You will attend a 2-hour lab session most weeks during the semester.

*See Course Schedule and Course Home Page for details about your lab section and your TA.*

**Student Drop-in Hours:** Tu/Th 1-2pm in ART 149 (Meaghan's office). *Meetings also available by appointment.*

## What is this course about?

This course explores the phenomenal ways the human body responds to the physiological stress of exercise. We will study the acute metabolic, neuromuscular, and cardiorespiratory responses to various kinds of physical activity, and we'll examine the chronic responses to strength, power, and endurance training. In the lab, we will use the fundamental tools of exercise physiologists to investigate the body's responses to exercise and we will practice analyzing, interpreting, and communicating about physiological data.

## What will I learn in this course?

Upon successful completion of this course, students will be able to...

1. Compare and contrast the anaerobic and aerobic metabolic pathways that support various types of exercise; describe the metabolic adaptations that occur with strength, power and endurance training
2. Describe neuromuscular function during various types of exercise; describe the neuromuscular adaptations that occur with strength, power and endurance training
3. Describe cardiorespiratory function during various types of exercise; describe the cardiorespiratory adaptations that occur with strength, power and endurance training
4. Collect, analyze, interpret, and communicate about data related to metabolic, neuromuscular, and cardiorespiratory responses to resistance, sprint, and aerobic exercise.
5. Demonstrate professional conduct and inclusive collaboration as expected in exercise, research, and clinical settings.

## How will I be graded in this course?

<b>LECTURE = 70%</b>
<b>Engagement - 10%</b> <ul style="list-style-type: none"><li>• Throughout semester</li><li>• In-class iClicker quizzes (participation only)</li><li>• Occasional in/out-of-class activities (completion only)</li><li>• 3 lowest/missed scores will be dropped</li></ul>
<b>Review Quizzes – 10%</b> <ul style="list-style-type: none"><li>• Following most classes, due within 1 week of posting</li><li>• Up to 3 attempts each; average score recorded</li></ul>
<b>Metabolism Quiz - 5%</b> <ul style="list-style-type: none"><li>• Thu Feb 1 – in class</li><li>• Two-stage quiz: 4% from individual grade, 1% from team grade</li></ul>
<b>Mid-term I - 10%</b> <ul style="list-style-type: none"><li>• Thu Feb 15 – in class</li><li>• Two-stage cumulative exam: 8% from individual grade, 2% from team grade</li></ul>
<b>Mid-term II - 15%</b> <ul style="list-style-type: none"><li>• Tue Mar 26 – in class</li><li>• Two-stage non-cumulative exam: 12% from individual grade, 3% from team grade</li></ul>
<b>Final Exam 20%</b> <ul style="list-style-type: none"><li>• Date TBD – sometime during official exam period (Apr 15-26)</li><li>• Two-stage cumulative exam: 16% from individual grade, 4% from group grade</li></ul>
<b>LAB = 30%</b>
<b>Preparation &amp; Professionalism – 10%</b> <ul style="list-style-type: none"><li>• Throughout semester</li><li>• Includes pre-lab quizzes, attendance, data submission, conduct in lab sessions</li><li>• 1 attendance/conduct grade will be excused</li></ul>
<b>Assignments - 20%</b> <p>Due at beginning of lab sessions. See Course Schedule for due dates.</p> <ul style="list-style-type: none"><li>• Time Management (Individual) 2%</li><li>• Lactate Metabolism (Individual) 3%</li><li>• Force-Angle Relationship (Individual) 3%</li><li>• Aerobic Metabolism Calculations (Individual) 4%</li><li>• Performance Prediction (Individual) 4%</li><li>• Efficiency/Economy Presentation (Team) 4%</li></ul>

### Please note:

- **You must pass both the lecture and lab component in order to pass the course.** If you fail either component, your final grade will be entered as a maximum of 49%, even if your calculated total is greater.
- For all two-stage exams, the team score will only contribute to your grade if it is HIGHER than your individual score.

## Course Schedule

	<b>Tuesday</b>	<b>Thu</b>	<b>Lab</b>	<b>Assignments Due</b> <i>5-d grace period unless noted</i>
<b>Week 1</b> Jan 8-12	Intro to Exercise Physiology Course Orientation	Mechanical Work	--	
<b>Week 2</b> Jan 15-19	Biological Work & Energy Systems	Anaerobic Metabolism I: Creatine Kinase + Glycolysis	Intro to Ex Phys Labs Participant Pre-screen	<b>Time Management</b>
<b>Week 3</b> Jan 22-26	Anaerobic Metabolism II: Lactate + Acidosis	Aerobic Metabolism I: Citric Acid Cycle + ETC	Anaerobic Power	
<b>Week 4</b> Jan 29 – Feb 2	Aerobic Metabolism II: ETC + Beta Oxidation	<b>Metabolism Quiz (5%)</b>	Lactate Workshop	
<b>Week 5</b> Feb 5-9	Generating Force I: Mechanical Factors	Generating Force II: Morphological/Neural Factors	Observing the Force-Angle Relationship	<b>Lactate Metabolism</b>
<b>Week 6</b> Feb 12-16	Strength/Power Training Adaptations	<b>Midterm I (10%)</b>	Force-Angle Workshop	
<b>Week 7</b> Feb 19-23	<b>READING WEEK – NO CLASSES OR LABS</b>			
<b>Week 8</b> Feb 26 –Mar 1	Oxygen Consumption & Vo <sub>2</sub> max	Vo <sub>2</sub> Responses to Exercise RQ & RER	Aerobic Metabolism	<b>Force-Angle Relationship</b>
<b>Week 9</b> Mar 4-8	Respiratory I: Ventilation	Thresholds	Aerobic Power	<b>Aerobic Metabolism Calculations</b>
<b>Week 10</b> Mar 11-15	Endurance Performance I: Vo <sub>2</sub> max & Thresholds	Endurance Performance II: Efficiency & Economy	Thresholds Workshop	
<b>Week 11</b> Mar 18-22	Respiratory II: Gas Transport & Exchange	Catch-Up & Review	What Influences Efficiency? Data Collection	<b>Performance Prediction</b>
<b>Week 12</b> Mar 25-29	<b>Midterm II (15%)</b>	Cardiovascular I: Cardiac Output	--	
<b>Week 13</b> Apr 1-5	Cardiovascular II: Blood Pressure & Blood Flow	Endurance Adaptations I	What Influences Efficiency? Presentations	<b>Efficiency Presentation (FIRM)</b>
<b>Week 14</b> Apr 8-11	Endurance Adaptations II	Review & Wrap-Up	--	

## How will this course run?

This course will be delivered **in-person**. Some new concepts will be introduced in class, but we will spend a lot of our time together reviewing and applying concepts you have been exposed to on your own time.

- You are expected to prepare for each class session by completing any assigned readings, videos or activities (indicated in weekly Canvas modules).
- You should come to class prepared to take notes (digitally or on paper) and will need a device that allows you to participate in in-class quizzes (via iClicker) and to access and work with in-class learning materials that will be posted on Canvas. Phones will work but laptops or tablets are strongly recommended. Ensure your device is charged since outlets in the classroom are limited. You will often need a calculator in class as well.
- You will also be required to complete post-class review quizzes that are designed to help clarify course content and identify any misunderstandings and/or learning outcomes in need of further study or practice.

All lecture slides from class will be available on Canvas. I will also make every effort to post class recordings on Canvas, but their quality and availability is not guaranteed.

## Do I need to buy a textbook or any other materials?

There is no required textbook for this course and nothing to purchase. All course materials will be provided as PDFs or links to open-access materials.

The following exercise physiology textbooks are available online (FREE!) through the UBC Library and they are strongly recommended as go-to resources.

[Exercise Physiology for health, fitness and performance](#), Sharon Plowman & Denise Smith (2017)

[Exercise Physiology: integrating theory and application](#), WJ Kraemer, SJ Fleck & MR Deschenes (2016)

[Exercise Physiology for health and sports performance](#), Nick Draper (2013)

## Should I come to class? What if I need to miss a class or two?

Class attendance is not technically mandatory but it is expected and it is HIGHLY recommended. Classes will include opportunities to apply knowledge, practice skills, and clarify misconceptions about material you have seen outside of class. Some new material will also be introduced and explored. Classes will also include iClicker quizzes and activities that will count towards your “Engagement” grade.

Even if you prioritize attending class, I realize that life sometimes gets in the way. Therefore, your total Engagement grade will be calculated by dropping your three lowest-scoring (or absent) activities. Additional absences will begin to directly affect your grade and will almost certainly impair your learning and performance on other assessments.

- If you miss class for any reason, you **do not** need to let your instructor know. If you can’t attend class, you will still be able to review slides, watch recordings of class, and work through learning activities and review quizzes on your own time. However, you will not be able to earn engagement points or benefit from the opportunities in class to learn with your team.
- If you do miss class, I encourage you to take advantage of the course recordings and to humbly ask for help from peers to help you catch up on any material you miss. Student hours can be used to supplement your own efforts to get caught up but shouldn’t be considered a replacement for coming to class.
- If you anticipate missing more than two classes in a row, please see the section below on “what if my studies are unexpectedly interrupted...?”

## What are labs? What if I need to miss one?

Labs are a central part of your learning experience this semester and attendance is **mandatory**.

Labs will provide opportunities to see (and feel!) physiology in action, and to learn about the tools we use to assess physiological function during various types of exercise. You will observe and experience phenomena that we discuss in class and you'll collect data that will be used to complete lab assignments. We'll also dig deeper into some of your laboratory data during class time.

Labs will support the continued development of important skills related to collaboration, spreadsheets and data analysis, quantitative reasoning, and visual communication of quantitative information and physiological concepts. They will also help you develop professional competencies to prepare you for practice in exercise, research, and clinical settings.

- If you miss a lab, you **do not** need to let your instructor know. However, you **must** notify your TA and your team members, ideally in advance. You will establish guidelines with your team about how you will handle lab absences, how to contribute to graded assignments, and how to get caught up on missed material.

## Team-Based Learning

You will be randomly placed on a **lab team** with about four other people from your lab section. This will be the group you work with during lab sessions to collect data and collaborate on other lab activities. Only one lab assignment (the final presentation) is completed and graded as a team assignment; the remainder will be submitted and graded individually. You are welcome to work on individual assignments with your lab team or anyone else from class, but you are expected to submit work that you complete yourself.

You can choose your own **lecture team** of 4-5 people total. This is the team you should sit with during class time so you can work together on iClicker questions and other in-class activities. You will also complete the group portion of the quiz, midterms, and final exam with your lecture team. Your goal should be to team up with people who will help you learn as much as possible – and this isn't necessarily the students who you think are the "smartest" or those who will get the highest grades in the class! Look for teammates who might have different perspectives and different strengths than your own. Although some differences can be good, to minimize frustrations I do recommend teaming up with students who have a similar commitment to attending class and to completing class prep work as you do. It is also important to choose teammates who will help you build psychological safety on your team – those who have the patience to help you learn and those who will be open to learning from you.

## 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. See the [Academic Calendar](#) for more details.

## Learning Environment Expectations:

UBC and the School of Health and Exercise Sciences are committed to equity, human rights and respect for diversity. All members of the learning environment should strive to create an atmosphere of mutual respect and inclusion where all members of our community can express themselves, engage with each other, and respect one another's differences. We do not condone discrimination or harassment against any persons or communities. If students encounter any problems, these should be discussed with your instructors and/or teaching assistants. If problems persist or your concerns involve the instructor or TA, please reach out to the Director of the School ([tanya.fornieris@ubc.ca](mailto:tanya.fornieris@ubc.ca)) or the campus Ombudsperson ([ombuds.office.ok@ubc.ca](mailto:ombuds.office.ok@ubc.ca)).

## Etiquette & Communication:

- Email communication must be professional and courteous with subject, your name, student number and course indicated. Doing so helps faculty members better respond to your concerns as many of our faculty teach multiple courses or hold multiple responsibilities with the school and across the campus.
- Email communication should be succinct with direct questions. Concerns needing significant clarification are better addressed in student hours.
- All written communication, including exams, must be legible.
- Computers and phones should only be used for course purposes during class/lab time. Other uses can be distracting to the students around you.
- The course outline for any given course is NOT comprehensive. Changes in content and in dates of assessments may occur for unforeseen circumstances. In addition, instructors typically post the details regarding assignment expectations via Canvas. It is your responsibility to read all communications and documents posted via Canvas to remain aware of any changes throughout the course.
- If there are any concerns related to the course content or delivery, please communicate these concerns to the instructor in a professional manner to resolve. If concerns remain unresolved you can bring your concerns forward by emailing [hes.undergrad@ubc.ca](mailto:hes.undergrad@ubc.ca).

## What if I miss an assignment deadline?

This course uses a flexible deadline policy.

**All submissions are expected on the due date.** These due dates are set in order to keep you on track with your course work and to make sure that TAs have time to grade submissions and provide feedback.

**There will be no grade penalty for most assignments submitted with a 5-day grace period.** This grace period is automatically applied and you **do not** need to ask permission or notify your instructor or TA in order to benefit from this grace period.

**Deadlines that are described on the schedule as "FIRM" do not have a grace period.** These assignments are subject to a 10% grade deduction per day of delay. Submissions that are more than one day late may become ineligible to receive feedback.

It is in your best interest to treat the expected due dates as though they were final deadlines and to make use of the grace period ONLY when it is necessary. It is your responsibility to keep track of deadlines, including which ones are flexible or firm.

## What if I miss a quiz, midterm, or final?

If you miss a quiz or midterm because of an eligible, short-term situation (described below) you can request a re-take by 1) notifying your instructor of your absence as soon as possible (ideally in advance), and 2) submitting a [Self-Declaration Form](#). If you miss a major assessment as a result of a longer disruption to your studies, you will need to initiate a request for academic concessions through your instructor. Either way, you will be required to complete the assessment at the earliest date that can be arranged by your instructor.

The policies around final exams are a bit more formal because exams are administered by the university outside of class time. If you miss a final exam due to illness or emergency, you **MUST** request academic concessions within 48 hours of the missed exam in order to be eligible to re-write the exam at a later date.

If you miss a quiz, midterm, or final and do not communicate promptly with your instructor, you will receive a grade of zero for that assessment.

## What if my studies are unexpectedly interrupted during the term?

In the School of Health and Exercise Sciences we care about your wellbeing and we are committed to supporting you in reaching your academic goals. We understand that life can present unanticipated events or challenges.

**If you experience a disruption that is likely to impact your ability to attend mandatory events or meet deadlines for more than one week**, you should talk to your instructor about requesting an academic concession. You may be required to provide the university with formal documentation (like a medical note, death certificate, etc.) but **YOU DO NOT** need to share any justification or personal information with your instructor. If you find yourself in this situation, make sure you initiate your request through your instructor as soon as possible. More details about concessions are found in the HES Academic Concessions document on the Canvas course home page.

**If you experience a disruption that you expect will impact your academics for less than a week**, you might be able to submit a self-declaration form in lieu of requesting concessions. The [School of Health and Exercise Sciences \(HES\) Self-Declaration Form](#) does not require disclosure of personal information to anyone and is intended to be used in the following circumstances:

- **Unforeseen Events:** An acute illness that is likely to resolve without seeing a health professional or a traumatic event experienced by the student, a family member, or a close friend.
- **Conflicting Responsibilities:** Life events that are scheduled beyond the student's control and normally arise after the student has registered in courses (e.g., representing university at an event, court appearance, military duty, provision of care to a family member).

If you believe your situation warrants a self-declaration, you should go ahead and submit one. You **must** also email your instructor to let her know you have done so, and what you will be missing. You **do not** need to disclose any information about the reasons you are submitting.

Note: *You may only submit a self-declaration request once per term* and accommodations will not be considered for job interviews, volunteer commitments, travel/vacation plans, or work schedules. Students are expected to plan their personal affairs around their academic responsibilities. Please see the [HES Self-Declaration Form](#) for further information and conditions on the use of the Self-Declaration.

## Can I get disability-related accommodations in this class?

Many students are entitled to academic accommodations that reduce barriers to participation and optimal performance in university. This could include additional time to write a midterm/final, deadline extensions, or other accommodations. If this pertains to you, please register as soon as possible with the [Disability Resource Centre](#). The DRC will automatically inform me of any approved accommodations.

## Other Course 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>

### **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 Services 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](mailto:drc.questions@ubc.ca)  
Web: [www.students.ok.ubc.ca/drc](http://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](mailto:equity.ubco@ubc.ca)  
Web: [www.equity.ok.ubc.ca](http://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](mailto:healthwellness.okanagan@ubc.ca)  
Web: [www.students.ok.ubc.ca/health-wellness](http://www.students.ok.ubc.ca/health-wellness)

### Sexual Violence Prevention and Response Office (SVPRO)

SVPRO is a confidential place for those who have experienced, or been impacted by, any form of sexual or gender-based violence, harassment or harm, regardless of where or when it took place. They aim to provide a safer space for people of all identities and experiences, including all genders and sexualities. SVPRO can help you find a safe place to stay, help you arrange academic concessions, explain your reporting options, and will even go with you (if you want) to the hospital, police, or court. They prioritize your safety and wellness, and support you in making decisions that are right for you.

phone: 250.807.9640  
email: [svpro.okanagan@ubc.ca](mailto:svpro.okanagan@ubc.ca)  
web: [www.svpro.ok.ubc.ca](http://www.svpro.ok.ubc.ca)

### **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](mailto:ombuds.office.ok@ubc.ca)  
Web: [www.ombudsoffice.ubc.ca](http://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](mailto:learning.hub@ubc.ca)  
Web: [www.students.ok.ubc.ca/slh](http://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. Come and see us – we are here to help! You may also contact [geo.ubco@ubc.ca](mailto:geo.ubco@ubc.ca)

## **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](http://www.security.ok.ubc.ca)

### **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.*