THE UNIVERSITY OF BRITISH COLUMBIA

## Land Acknowledgement

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

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

**Instructor:** Dr. Meaghan MacNutt, meaghan.macnutt@ubc.ca

**Duration:** Jan 5 – Apr 9, 2026

**Class Time:** Mon/Wed 2-330pm *(except Reading Week)*

**Class Location:** FIP 204

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

See Course Schedule and Canvas Course Home Page for details about your lab schedule and your TA.

**Student Drop-in Hours**: Mon/Wed 1230-130pm in ART 149 (Meaghan's office).

Online and in-person meetings with Meaghan can also be booked here.

## 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 will examine the chronic responses to resistance and endurance training. In 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, explain and predict the metabolic adaptations that occur with resistance and endurance training
2. Describe neuromuscular function during various types of exercise; describe, explain and predict the neuromuscular adaptations that occur with resistance endurance training
3. Describe cardiorespiratory function during various types of exercise; describe, explain and predict the cardiorespiratory adaptations that occur with resistance and endurance training
4. Collect, analyze, interpret, and communicate about data related to metabolic, neuromuscular, and cardiorespiratory responses to exercise.
5. Demonstrate professional conduct and inclusive collaboration as expected in exercise, research, and clinical settings.

# How will I be graded in this course?

## LECTURE = 70%

**Engagement - 5%**

- Throughout semester
- Daily in-class iClicker questions (full points for responding to at least 50% of each day's polls)
- Occasional Canvas activities
- Three lowest/missed scores will be excused

**Review Quizzes – 15%**

- ~Weekly throughout semester, due 1 week after posting
- Up to 3 attempts per quiz; average score recorded
- One lowest/missed score will be excused
- FLEX DEADLINES: No grade penalty for quizzes completed up to 3d (72h) after due date. After that, quizzes become unavailable and receive a grade of 0.

**Mid-term I - 15%** (based on Weeks 1-5)

- Mon Feb 9, in class
- Two-stage exam: 13.5% from individual grade, 1.5% from team grade

**Mid-term II - 15%** (based on Weeks 6-11)

- Wed Mar 25, in class
- Two-stage exam: 13.5% from individual grade, 1.5% from team grade

**Final Exam 20%** (based on Weeks 1-13; guidance will be given on focus areas)

- Date TBD – sometime during official exam period (Apr 13-24)
- Two-stage exam: 18% from individual grade, 2% from group grade

## LAB = 30%

**Preparation & Professionalism – 10%**

- Throughout semester
- Includes lab attendance / conduct, in-lab prep quizzes, and prompt submission of any lab data
- One absence (or lowest grade) will be excused

**Assignments - 20%**

- Individual submissions due before subsequent lab session. See Course Schedule for due dates.
  - Sprint Performance & Metabolism - 4%
  - Strength Performance - 2%
  - Aerobic Metabolism - 2%
  - Vo2max - 2%
  - Cardiorespiratory Responses - 4%
  - Endurance Performance – 2%
  - Endurance Adaptations – 4%

**Please note:**

- **You must pass both the lecture and lab components 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.
- **To pass the course, the weighted average of your midterms and finals must also be at least 50%.** If not, your final grade will be entered as a maximum of 49%, even if your calculated total grade is greater.
- For all two-stage exams, the team score will only contribute to your grade if it is HIGHER than your individual score.

HES 105 – Exercise Physiology I, Jan-Apr 2026

# Course Schedule

| | Mon | Wed | Lab | Lab assignments due prior to lab session *(plus 3-d grace period)* |
|---|---|---|---|---|
| **Week 1** Jan 5-9 | Intro to Exercise Physiology Course Orientation | Work, Power & Energy Systems | NO LAB | |
| **Week 2** Jan 12-16 | Phosphagen System + Glycolysis | Cellular Respiration | Lab 1. Intro to Ex Phys Labs Participant Pre-screen | |
| **Week 3** Jan 19-23 | Lactate and Acidosis | Metabolic Applications | Lab 2. Anaerobic Power | |
| **Week 4** Jan 26 – 30 | Generating Muscle Tension | Determinants of Strength | Lab 3. Lactate Workshop | |
| **Week 5** Feb 2-6 | Neuromuscular and Metabolic Training Adaptations | Fatigue and Recovery (+ Review) | Lab 4. Strength Curves | **Sprint Performance & Anaerobic Metabolism (4%)** |
| **Week 6** Feb 9-13 | **Midterm I (15%)** | $Vo_2$ Responses | Lab 5. Measuring $Vo_2$ (asynchronous module) | **Strength Performance (2%)** |
| **Week 7** Feb 16-20 | **READING WEEK – NO CLASSES OR LABS** | | | |
| **Week 8** Feb 23-27 | $Vo_2$max and Endurance Performance | Cardiac Output I + Blood Flow Distribution | Lab 6. Aerobic Metabolism | |
| **Week 9** Mar 2-6 | Blood Pressure | Cardiac Output II | Lab 7. Aerobic Power | **Aerobic Metabolism (2%)** |
| **Week 10** Mar 9-13 | Ventilation | Thresholds + Metabolic "Zones" | Lab 8. Cardiorespiratory Responses Workshop | **$Vo_{2\text{-max}}$ (2%)** |
| **Week 11** Mar 16-20 | Gas Transport & Exchange I | Gas Transport & Exchange II | Lab 9. Thresholds Workshop | **Cardiorespiratory Responses (4%)** |
| **Week 12** Mar 23-27 | Cardiorespiratory Review | **Midterm II (15%)** | NO LAB | **Endurance Performance (2%)** |
| **Week 13** Mar 30 – Apr 3 | Cardiorespiratory Training Adaptations I | Cardiorespiratory Training Adaptations II | Lab 10. Endurance Adaptations Workshop | |
| **Week 14** Apr 6-9 | -- | Review and Wrap-Up | | **Endurance Adaptations (4%)** |

## How will this course run?

This course will be delivered **in-person**. I will make every effort to post class recordings on Canvas, but their quality and availability is not guaranteed.

- There will not generally be any required reading/viewing before class. However, this class builds directly on important concepts from some of your pre-requisite and co-requisite courses. Sometimes I will give suggestions for topics you might want to review before class and/or will post some brief videos or activities to help refresh your memory. These are all optional, but highly recommended.
- Lecture slides will be posted on Canvas in advance, and it is a great idea to review these before class. When necessary, "complete" slides (with blanks filled in, etc.) will be posted after class but these should not be considered a good substitute for taking your own notes in class (either digitally or on paper).
- You will need to bring a device to class that allows you to participate in in-class polls (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 sometimes need a basic calculator in class as well. You are welcome to use your phone calculator in class but NOT on midterms or the final exam.
- After class, you will be required to complete weekly 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.
- Additional optional (ungraded) practice quizzes will be available to give you more opportunities to assess your own learning and prepare for the midterms and final.

## 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. Access these books using the links below.

**Exercise Physiology: integrating theory and application**, WJ Kraemer, SJ Fleck & MR Deschenes (2021)

- This one is a bit more introductory.

**Exercise Physiology for health, fitness and performance,** DL Smith, SR Plowman, and MJ Ormsbee (2023)

- This one is a bit more advanced.

If you are prompted for login info:

- Click on "Sign in via: Open Athens"
- Under Federation, select "OpenAthens Federation"
- Under Institution, select "University of British Columbia"
- Log in with your cwl.
- You can then create a free personal account with your UBC email to make future access a bit easier.

## 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 course material. 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 or iClicker sessions. 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 development of important skills related to collaboration, using spreadsheets, 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 and how to get caught up on missed material.

## Team-Based Learning

You will work on the same **learning team** throughout the term, in both lecture and lab. Evidence indicates that team-based learning enhances student motivation learning and academic performance. Learning to work well with others and to foster a respectful and productive team environment is also an essential professional skill – and it's one of the learning outcomes of this course!

- In lab sessions, you will work with your team to collect data and collaborate on other lab activities, but all lab assignments are submitted and graded individually. You are welcome to work on individual assignments with your team or anyone else from class, but you are expected to submit work that you complete yourself.
- In class, you should sit with your team each day so you can work together on iClicker questions and other in-class activities. This will help prepare you to complete the group portion of the midterms and final exam with your team. These team scores will contribute to your course grade, BUT ONLY IF THEY PULL YOUR GRADE UP!
- You will meet your learning team in your first lab session, so please make any changes to your lab section before Week 2. Until then, you can sit in class with anyone you like.

## 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.

In this course, the **use of generative AI tools** (like Chat GPT, CoPilot, etc.) is NOT strictly prohibited. Your instructor will provide some guidance about when and how you might consider using these tools effectively, in ways that will enhance your learning rather than hinder it, and in ways that will not compromise academic integrity. Note that this is a course-specific policy. Check with the instructor before using these kinds of tools in other classes.

## 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.forneris@ubc.ca) or the campus Ombudsperson (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.

## 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.

However, t**here will be no grade penalty for lab assignments or review quizzes submitted with a 3-day grace period** following the due date. This "flex" 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. After the flex period is over, review quizzes will no longer be available and will receive a grade of zero. Assignments can still be submitted after the flex period is over but are subject to a 10% grade deduction per day of delay (up to a maximum penalty of 50% of assignment value). Extensions beyond the flex period will only be considered for students submitting a self-declaration form or requesting academic concessions. See following sections for more details.

It is in your best interest to treat all due dates as though they were final deadlines and to make use of the flex period ONLY when it is necessary. It is your responsibility to keep track of deadlines.

Note that all **engagement activities have firm deadlines** and are not available for completion after the due date.

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

If you miss a 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 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 classes/labs 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 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 you your situation warrants a self-declaration, you should go ahead and submit one. 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.

Many students who are not formally registered with the DRC also have access needs related to disability and/or physical and mental health. This course is designed and delivered in ways that aim to improve accessibility for all students. Please let me know via the anonymous survey if there are specific ways I can make this course more accessible for you.

## 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 can be found here under Policies and Regulation.

**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. Further information is available here.

# Helpful 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
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

## 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, end 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
web: www.svpro.ok.ubc.ca

## 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.

**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. Come and see us – we are here to help! You may also contact 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

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constitutes a breach of copyright and may lead to academic discipline.