

KINESIOLOGY/BIOLOGY 3011
Physiology of Exercise II
Winter 2026



Lakehead
UNIVERSITY

School of
Kinesiology

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TIMES:

Class Times:

Mon/Wed

11:30 – 1:00pm

SB-1016

CALENDAR DESCRIPTION:

This course is a continuation of Kinesiology 3010. Topics include: body composition, obesity, and nutrition; training for performance; factors affecting performance; laboratory assessment of performance; and thermoregulation, exercise, and the environment. Students will utilize laboratory assessments to develop an exercise/lifestyle prescription for a volunteer client.

Pre-requisite: Kinesiology 3010

COURSE FORMAT:

Two, 1.5 hr classes per week. Includes in-person lecture and lab time.

The course will be divided into two, 6-week parts. Part 1 will place an emphasis on broad discussions of exercise physiology theory, journal articles, and specific areas of exercise physiology that are of interest to students. Part 2 will place emphasis on lab experiments/demonstration, activities, and technologies used to measure human physiology during exercise and work.

LEARNER OUTCOMES:

At the conclusion of this course students will be able to explain the biochemical and physiological adaptations which occur in the human body to meet the acute and chronic demands of different types of exercise and work. More specifically they will be able to integrate and apply principles and theories of exercise training and physiology to laboratory experiments and equipment.

EVALUATION:

<u>Item</u>	<u>Weighting</u>	<u>Due Date</u>
Part 1		
Journal Article Presentation (small groups)	25%	Jan 19 th – Feb 4 th
Participation/Attendance	10%	
Part 2		
Lab Notebook	15%	Last day of term (EOT)
Standard Operating Procedure	20%	After March 9 th (to EOT)
Participation/Attendance	10%	
Final in-class assignment (open book)	20%	Last week of class

Journal Article Presentation

In groups of 2-3, you will present on an article of your choice (and instructor approval) that utilises a common technology in exercise physiology research (see below), and investigates a related topic/question

While you are not limited to the following points, in your presentation and discussion you will be asked to include:

- 1) Background and theory related to the research question(s)
- 2) Background and theory related to the technology used
- 3) How the technology is related and can be used to demonstrate key concepts in exercise physiology, as well as how it addresses the research questions
- 4) Practicality of the technology for use in undergraduate laboratories and how it might be implemented

Note that the goal of the presentation is to stimulate interest and discussion in the topic, not necessarily to “know” or be “correct.” As the instructor, I will help facilitate and lead discussion after your presentation.

Topic Options

- B-mode ultrasonography (ultrasound)
- Indirect calorimetry (Metabolic Cart)
- Spirometry
- Dynamometry
- Electromyography/interpolated twitch
- Ergometry
- Electrocardiography/heart rate
- Blood Pressure
- Body Composition (Bioelectrical impedance)
- “Wearables”

Additional information will be provided in class and on D2L

Lab Notebook

During part 2 of the course, several activities, experiments, and demonstrations will be performed individually, in groups, and by/with the instructor. You will keep a “notebook” of these activities, which will include relevant and key information needed to perform the activities. This notebook should also be annotated with your thoughts, results, insights, and suggestions for future activities. Additional information and guidance will be provided in class and on D2L

Standard Operating Procedure (SOP)

Related to your lab notebook, you will develop an SOP for a procedure or equipment of your choice. Essentially this is a detailed, step-by-step document, written so that someone else could perform the procedure, or operate the equipment in exactly the same way as another person with the same document and experience. Additional information and guidance will be provided in class and on D2L

REQUIRED TEXT AND RESOURCES:

Powers, S. K., Howley, E. T. & Quindry J. (2024). *Exercise physiology: Theory and application to fitness and performance* (12th ed.). New York, NY: McGraw-Hill Education.
(cost ~\$173.92)

Other readings will be uploaded on the D2L site.

ADDITIONAL COURSE INFORMATION:

The School of Kinesiology has adopted a series of policies that apply to all courses. Students are expected to be familiar with these policies and to abide by them. The course policy document may be found on the School of Kinesiology website at:

<https://www.lakeheadu.ca/academics/departments/kinesiology/regulations-and-policies>

Generative artificial intelligence (Generative AI or GenAI) is a category of AI systems capable of generating text, images, or other media in response to prompts. These systems include ChatGPT and its variants Bing (built by OpenAI) and Bard (built by Google) among several others. Other generative AI models include artificial intelligence art systems such as Stable Diffusion, Midjourney, and DALL-E.

GenAI tools can provide valuable assistance and support in academic work. However, it is essential to use them responsibly and ethically. The following information and guidelines apply to the use of AI-based tools in this course:

a) Student Responsibility

- o It is the responsibility of the student to understand the limitations of AI-based tools. While these tools can provide suggestions and insights, final decisions and critical thinking should come from the student's own understanding and effort. Before submitting, review your work with this in mind. If you don't understand what type of GenAI usage is appropriate, ask the course instructor for clarification.

b) Formative Usage

- o In this class, you may use GenAI for formative, but not summative, work. That means it can be used as a "possibility engine" (brainstorm tool), a "study buddy," a "collaboration coach," a "guide on the side," a "personal tutor," a "co-designer," etc. to help you learn course content, but it cannot be used as the primary vehicle for any work that is submitted for marks or evaluation. (See UNESCO's "ChatGPT and Artificial Intelligence in Higher Education Quick Start Guide," page 9, for explanations and examples of these and other roles GenAI can productively serve in a formative capacity.)

c) Error & Bias

- AI content is created by computer algorithms that have been trained using large amounts of data. The AI learns from patterns and examples in the data to generate new content that resembles what it has been trained on. If the training data used to train the AI model is biased or limited in scope, the AI may reproduce content that is inaccurate, incomplete, offensive, and/or biased. Students should weigh this as they consider material produced by AI.

d) Trustworthiness

- Generative AI can be vulnerable to manipulation and misuse. It can be used to generate fake news, misinformation, or deepfake content, which can have harmful consequences. Students should check AI generated content against reputable sources.

e) Plagiarism

- Since [writing and critical thinking ability] are learning outcomes of this course, all work submitted for evaluation must be the student's original work. Using the work of others (including content curated/generated by AI) without proper citation is considered plagiarism. See

“Citing Artificial Intelligence” for assistance with correct documentation.

f) Citation of Sources

- o If you use material generated by an AI program for an assignment in this course, it must be cited like any other source (with due consideration for the quality of the source, which may be judged as poor). Failure to do so will be considered a violation of academic integrity. See Student Code of Conduct – Academic Integrity.

Supports for Students

There are many resources available to support students. These include but are not limited to:

- [Health and Wellness](#)
- [Student Success Centre](#)
- [Student Accessibility Centre](#)
- [Library](#)
- [Lakehead International](#)
- [Indigenous Initiatives](#)

Lakehead University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities and/or medical conditions to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact Student Accessibility Services (SAS) and register as early as possible. For more information, please contact [Student Accessibility Services](#) (SC0003, 343-8047 or sas@lakeheadu.ca)

As a university student, you may sometimes experience mental health concerns or stressful events that interfere with your academic performance and negatively impact your daily activities. All of us can benefit from support during times of struggle. If you or anyone you know experiences academic stress, difficult life events or feelings of anxiety or depression, Lakehead has resources available to you. Check in with the [WellIU Key](#) to find the mental health resources you are looking for. Remember that getting help is a smart and courageous thing to do- for yourself, for those you care about, and for those who care about you. Getting support sooner rather than later is almost always helpful.

Courses offered by the School of Kinesiology address a number of the College of Kinesiologists of Ontario's entry-to-practice competencies. For more information on the competencies and becoming a registered Kinesiologist, visit the CKO website at

https://coko.ca/CKO_Public/Public_Content_Records/Apply_Subcontent3/Stu...

Unfair marking: If you feel you have been marked unfairly on an exam or a paper you are welcome to resubmit it while noting the specific area of concern, but keep in mind that the entire exam/paper will be remarked.

Late Policy: Based on the structure of the course, there is no formal late penalty for written assignments; however, assignments will not be accepted after the last day of classes without a bona fide personal, health, or athletic reason.

GENERAL COURSE SCHEDULE:

*subject to change

LECTURE OUTLINE	CHAPTERS IN TEXT
Week 1	Introduction/Course Planning
Week 2	Physiological consequences of training/overtraining
Week 3	ECG and Ultrasound
Week 4	Ultrasound and Twitch Interpolation
Week 5	EMG and Wearables
Week 6	Blood Pressure and Spirometry
Week 7	Standard Operating Procedures
Week 8	Lab Activities – HR, ECG, Blood Pressure
Week 9	Lab Activities – EMG and Ultrasound
Week 10	Lab Activities – Developing Submaximal Protocols
Week 11	Lab Activities– EPOC and VO ₂
Week 12	Lab and Lecture Assignment