



# KIN 335 001: Advanced Applications of Exercise Physiology (W1, 2020)

(formerly KIN 375)

3 Credits

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəyəm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on in their culture, history, and traditions from one generation to the next on this site.

## Course Description:

The course focuses on the application of our understanding of the regulation and integration of the neural, metabolic, cardiovascular, and respiratory systems during exercise. The transport and utilization of oxygen during exercise in humans is a primary focus. Third year standing is a prerequisite.

Course Structure: Fully Online

Your Instructor: Bill Sheel, [bill.sheel@ubc.ca](mailto:bill.sheel@ubc.ca)

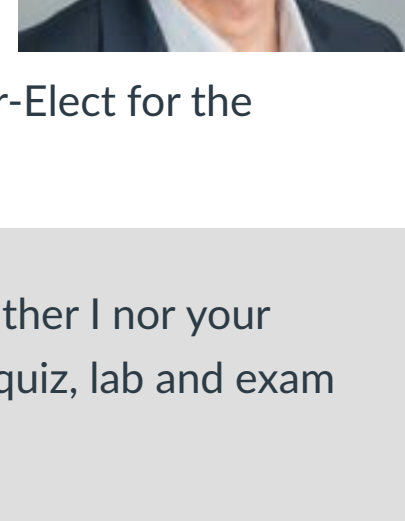
## Your Teaching Assistants:

- Shalaya Kipp, [shalaya.kipp@ubc.ca](mailto:shalaya.kipp@ubc.ca)
- Michael Leahy, [mick.leahy@ubc.ca](mailto:mick.leahy@ubc.ca)

## Instructor Bio

**BILL SHEEL, Ph.D., School of Kinesiology**

Dr. Sheel (Bill) completed his education at Canadian institutions (University of New Brunswick, University of British Columbia) followed by postdoctoral training at the University of Wisconsin-Madison. He is currently a Professor in the School of Kinesiology and Adjunct Professor in the Faculty of Medicine at UBC. In addition to teaching undergraduate courses and supervising graduate students he is the Chair of the School's Graduate Program. He performs several editorial duties for scientific journals and is the Chair-Elect for the Canadian Society for Exercise Physiology (CSEP).



Please note it may take up to **24 - 48 hours** to respond to your email during the week. Neither I nor your Teaching Assistant will be checking emails on weekends. Please keep this in mind around quiz, lab and exam time. **Please include KIN 335 in the subject line of emails.**

## Course Structure

This course includes: lectures, labs, online discussions, and tutorials. Information about this course, lecture slides, and important reminders will be made available here in the Canvas course. Please check the site regularly. You are responsible for the information posted here.

### Tutorials and "Live" Meetings

Tutorials and "Live" Meetings will be announced throughout the term using [Collaborate Ultra](#). The purpose will be to address questions and review previously discussed material. These will be scheduled during normal class times (Tuesday, Thursday 8-9:30 AM).

### Required Textbook

McArdle, W. D., Katch, F. K., & Katch, V. L. (2014). *Exercise physiology: Nutrition, energy, and human performance* (8th ed.). Wolters Kluwer.

### Schedule of Topics

Week/Date	Module Content	Reading	Activity
Week 1 Sept 10	Getting started	Course outline and schedule of readings & activities	Orientation
Week 2 Sept 15 & 17	Module 1A: Exercise metabolism	Textbook – Ch. 6 "Energy transfer in the body"	
Week 3 Sept 22 & 24	Module 1B: Exercise metabolism	(I) Textbook – Ch. 7 "Energy transfer during physical activity" (II) Assigned reading: "Lactate – friend or foe?"	MODULE 1 QUIZ #1 (open all day Sept. 24th)
Week 4 Sept 29 & Oct 1	Module 2A: The physiology of training energy transfer	Textbook – Ch. 21 "Training for anaerobic and aerobic power"	LAB #1
Week 5 Oct 6 & 8	Module 2B: The physiology of training energy transfer	Assigned reading: (I) "The physiology of champions" (II) "Refuting the myth of non-response to exercise training: 'non-responders' do respond to higher dose of training"	MODULE 2 QUIZ #2 (open all day Oct. 8th)
Week 6 Oct 13 & 15	Module 3A: Applications of training principles (high intensity interval training)	Assigned reading: "Physiological adaptations to interval training and the role of exercise intensity"	
Week 7 Oct 20 & 22	Module 3B: Applications of training principles (ergogenic aids)	Assigned reading: Textbook – Ch. 23 "Special aids to exercise training and performance"	MODULE 3 QUIZ #3 (open all day Oct. 22nd)
Week 8 Oct 27 & 29	Module 4A: Is exercise always good for you?	No reading. Lecture only. "Are there deleterious effects of acute and chronic endurance exercise"	LAB #2
Week 9 Nov 3 & 5	Module 4B: Exercise and pregnancy (a case study approach)	Assigned reading: "Are there concerns for completing a marathon at 39 weeks of pregnancy"	MODULE 4 QUIZ #4 (open all day Nov. 5th)
Week 10 Nov 10 & 12	Module 5A: Pulmonary physiology	(i) Textbook – portions of Ch.'s 12, 13, 14 (II) Textbook – Ch. 24 "High altitude"	
Week 11 Nov 17 & 19	Module 5B: Pulmonary physiology	Assigned readings: (I) "Live high, train low" (II) "Exercise-induced asthma"	MODULE 5 QUIZ #5 (open all day Nov. 19th)
Week 12 Nov 24 & 26	Module 6A: Aging	Assigned reading: (I)Textbook – Ch. 31 "Aging" (II) "Elite distance runners: a 45 year follow up"	LAB #3
Week 13 Dec 1 & 3	Module 6B: Sex-based differences <u>and</u> similarities in the physiology of exercise	No reading. Lecture only.	MODULE 6 QUIZ #6 (open all day Dec. 3rd)

## Labs

Specific laboratory information will be distributed through canvas. The topics of the labs are as follows:

### Lab 1: Identifying Thresholds & Exercise Intensity

The participant will perform an incremental test to exhaustion on a treadmill or cycle ergometer. Expired gasses, ventilation, heart rate and venous blood lactate will be collected. Students will learn how to identify various methods for identifying 'thresholds' and exercise intensities that can be used for training/exercise prescription purposes.

### Lab 2: Thermoregulation During Exercise

The goal of this lab is to examine physiological changes associated with increasing heat production in steady-state exercise. A participant will complete a 15-minute bout of exercise on the treadmill at 5 mph under thermoneutral conditions and, after 10 minutes of recovery, a second bout of exercise on the treadmill under hyperthermic conditions. For the thermoneutral trial the exercise bout will be done in regular exercise clothing. For the hyperthermic trial the participant will put on extra clothing layers to stimulate heat stress. A series of physiological variables will be compared between the two trials to gain a better understanding of heat stress and its role in performance.

### Lab 3: Exercise in Hypoxia

The goal of this lab is to examine physiological responses to hypoxia. Normoxia is the condition of having a normal oxygen level. Hypoxia is a condition in which the body or a region of the body is deprived of adequate oxygen supply at the tissue level. In this lab 3 intensity levels (resting / cycle 75 W / cycle 150 W) will be completed under the two environmental conditions (normoxia / hypoxia). Physiological variables will be monitored to see how they respond when the oxygen conditions are changed.

## Additional Materials

### Online Communications

In this course, and throughout your program, you are expected to communicate in a respectful and professional manner. You may find it helpful to review [UBC's Distance Learning Communication Online: Netiquette](#) web page.

### Blackboard Collaborate

This course may include Blackboard Collaborate Ultra sessions. These web conference sessions will give you opportunities to connect with your instructors and other students in real-time online meetings. Be sure to use these sessions to ask any content related questions that you may have. If you are new to Collaborate Ultra watch this [short orientation video](#) .

### Assessment

This course is graded as per UBC's standard grading practices described in the [Academic Calendar](#) .

Assessment	Worth
Laboratory (n=3. 25%/3)	25%
Quiz (n=5 of 6. 75%/5)	75%

## Faculty Resources

The Faculty of Education has a number of [resources to support learning](#) .

## University Policies

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available from the [UBC Senate Website](#) .

## Course Policies

Please make sure you are familiar with the academic policies and procedures.

### Academic Integrity

Students are expected to follow UBC policies for academic integrity and academic misconduct, which includes practices around plagiarism, referencing and citation, and copyright. For more see, UBC's [Learning Commons Academic Integrity resources](#) .

### Accessibility

If you have any challenges accessing materials that will impact your success in this course, UBC's Centre for Accessibility can support your needs by providing appropriate accommodations to support you.

- Web: [UBC's Centre for Accessibility website](#) .
- Email: [accessibility@ubc.ca](mailto:accessibility@ubc.ca)

### Learning Analytics

Some of the learning technologies used for this course collect data to support the improvement of teaching and learning. This includes the collection of data related to overall class progress to provide personalized feedback, engagement in discussion forums to support the fostering of community within the course, and how resources are being accessed to support improvements to the course design. To learn more about learning analytics at the Faculty of Education and at UBC, see the [What is Learning Analytics?](#) page.

### Help Resources

- If you are new to online learning or Canvas please review [eLearning Help & Resources](#).
- If you need assistance with research or writing, [Education Library Research Help](#) provides useful resources on these topics.
- If you have any technical difficulties with this Canvas course, please use the Help link in the global navigation menu bar.

## **Students Learning Outside of Canada**

During this pandemic, the shift to online learning has greatly altered teaching and studying at UBC, including changes to health and safety considerations. Keep in mind that some UBC courses might cover topics that are censored or considered illegal by non-Canadian governments. This may include, but is not limited to, human rights, representative government, defamation, obscenity, gender or sexuality, and historical or current geopolitical controversies. If you are a student living abroad, you will be subject to the laws of your local jurisdiction, and your local authorities might limit your access to course material or take punitive action against you. UBC is strongly committed to academic freedom, but has no control over foreign authorities (please visit <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,33,86,0> for an articulation of the values of the University conveyed in the Senate Statement on Academic Freedom). Thus, we recognize that students will have legitimate reason to exercise caution in studying certain subjects. If you have concerns regarding your personal situation, consider postponing taking a course with manifest risks, until you are back on campus or reach out to your academic advisor to find substitute courses.

For further information and support, please visit: <https://academic.ubc.ca/supportresources/freedom-expression>.