

Western University  
Faculty of Health Sciences  
**School of Kinesiology**

**KIN 3330F - Laboratory in Exercise Physiology**  
**Fall 2021**

## 1. Course Description

The most important requirement for exercise performance is the transport of oxygen ( $O_2$ ) to support the bioenergetic processes in muscle cells and elimination of carbon dioxide ( $CO_2$ ) formed as a by-product of muscle metabolism. Thus, an appropriate cardiovascular and respiratory response is necessary to meet the demands imposed by increases in muscle metabolism. This course will explore the use of non-invasive (respiratory gas exchange) and minimally invasive (blood sampling) techniques and specialized exercise testing to provide an experiential and mechanistic basis for: i) understanding integrative responses to exercise at different intensities; ii) evaluation of fitness and performance; iii) exercise prescription; and iv) development of effective exercise interventions in research and practical (e.g., exercise training) settings.

Laboratory protocols will allow students to collect, analyze, and interpret exercise test data, correctly evaluate aerobic fitness, (e.g., maximal  $O_2$  uptake,  $O_2$  uptake kinetics, lactate threshold, critical power), recognize normal intensity-dependent physiological response profiles (blood lactate and gas exchange responses), and accurately prescribe aerobic and anaerobic exercise. Lab data and protocols will be written-

receive feedback on written work to allow them to develop scientific writing skills to analyze and interpret data collected in the laboratory in context of the published literature. These formative skills

## 2. Learning Outcomes

By the end of the course, students should be able to:

1. Utilize common exercise physiology laboratory equipment (cycle ergometers; gas mixing chambers) and techniques (respired gas exchange; blood sampling) to monitor and assess physiological and metabolic responses to exercise.
2. Understand how these physiological and metabolic responses change at different intensities of exercise.
3. Collect, analyze, and interpret exercise test data to correctly evaluate aerobic fitness, (e.g., maximal oxygen uptake, gas exchange threshold, critical power) and recognize normal intensity-dependent response profiles (blood lactate and gas exchange responses).

10	
11	<b>READING WEEK</b>
12	Laboratory determinants of performance
13	<b>REVIEW FOR FINAL EXAM</b>

### 3.2. Lab

Each lab runs for 1 or 2 weeks as indicated in the Table below. You attend one lab every week. Lab section numbers correspond to the day, time, and room in which the lab sessions will take place. For sections 2, 3, 4 and 8, labs will be held in room AHB 1R43 and, for sections 5, 6, 7, and 9, labs will be held in AHB 3R07.

Appropriate dress (gym wear) is required for all labs. Please come to each lab prepared to exercise. Data collected in your lab will be needed to complete each of the lab assignments and the manuscript assignment.

Labs begin the week of September 13<sup>th</sup>. Note also that reading week occurs within Week 11, therefore it is not listed in the dates below.

Lab	Date	Lab Topic
1	Week 1	Introduction to the Exercise Physiology Lab
2	Weeks 2 and 3	Incremental Exercise
3	Weeks 4 and 5	Aerobic Exercise Prescription
4	Weeks 6 and 7	Oxygen Uptake Kinetics
5	Weeks 8 and 9	Blood Lactate Threshold
6	Week 10	Critical Power
7	Week 11	Maximal Lactate Steady State

#### Notes:

1. All lecture and laboratory materials will be posted on OWL.
2. We will attempt to cover all material as indicated above but it is possible that we might not complete all listed material, that additional material may be added, or the order of lectures will be reorganized.
3. Attendance of lectures is highly recommended. For most lectures, slides will be the primary source of material, but additional material may be included.
4. Laboratory sections have been determined well in advance. Legitimate excuses for missing or re-scheduling labs include illness, compassionate circumstances, etc. Extended vacations, extra work, etc. do not qualify.
5. Exam periods have been selected to conflict as little as possible with other scheduled classes. Please report any potential conflicts **NOW**, do not wait until the week before the exam.

#### 4. Required Course Material/Text:

There is no required textbook for the course. All required readings will be posted on OWL or listed amongst the references for each lab protocol.

### 5. Course Evaluation Plan:

Grades are a measure of the performance of a student in individual courses. Each student shall be judged on their knowledge and command of the course materials.

<b>Lab Assignments</b>	<b>Value: 30%</b>	<b>Dates: See below</b>
Lab Assignment #1	10% analysis and interpretation of data collected in Labs #2 & 3 <u>due:</u> October 22	
Lab Assignment #2	5% Analysis and interpretation of data collected in Lab #4 <u>due:</u> November 8	
Lab Assignment #3	5% Analysis and interpretation of data collected in Lab #5 <u>due:</u> November 26	
Lab Assignment #4	10% Analysis and interpretation of data collected in Lab #6 & 7 <u>due:</u> December 8	
<b>Manuscript</b>	<b>Value: 45%</b>	<b>Dates: see below</b>
Mini report: Introduction	5% Draft of manuscript introduction <u>due:</u> September 29	
Mini report: Methods	5% Draft of manuscript methods <u>due:</u> October 14	
Mini report: Results	5% Draft of manuscript results <u>due:</u> October 28	
Scientific Manuscript	30% Complete draft of scientific manuscript <u>due:</u> November 25	
<b>Laboratory Exam</b>	<b>Value: 25%</b>	<b>Date: TBA</b>

Laboratory exam will cover material from all labs and will involve analysis and interpretation of exercise responses.

~1.5-to-2-hour exam. Location to be determined/MCID9 91 Tm0 g0 G

## Statement of Online Etiquette

Some components of this course will involve online interactions. To ensure the best experience for both you and your classmates, please honour the following rules of etiquette:

please use your computer and/or laptop if possible (as opposed to a cell phone or tablet)  
ensure that you are in a private location to protect the confidentiality of discussions in the event that a class discussion deals with sensitive or personal material  
to minimize background noise, kindly mute your microphone for the entire class until you are invited to speak, unless directed otherwise

connection becomes unstable  
unless invited by your instructor, do **not** share your screen in the meeting

The course instructor will act as moderator for the class and will deal with any questions from participants. To participate please consider the following:

click the raise hand function and wait for the instructor to acknowledge you before beginning your comment or question  
remember to unmute your microphone and turn on your video camera before speaking  
self-identify when speaking.  
remember to mute your mic and turn off your video camera after speaking (unless directed otherwise)

Keep in mind the different cultural and linguistic backgrounds of the students in the course.  
Be courteous toward the instructor, your colleagues, and authors whose work you are discussing.

Be respectful of the diversity of viewpoints that you will encounter in the class and in your readings. The exchange of diverse ideas and opinions is part of the scholarly environment.

Be professional and scholarly in all online postings. Cite the ideas of others appropriately.

Note that disruptive behaviour of any type during online classes, including inappropriate use of the chat function, is unacceptable. Students found guilty of Zoom-bombing a class or of other serious online offenses may be subject to disciplinary measures under the Code of Student Conduct.

## Course/University Policies

### 1. Academic Offences:

They are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: [https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf)

Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar). All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western University and Turnitin.com <http://www.turnitin.com>

Computer marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

### 2. Electronic Device Usage:

**During Lectures and Tutorials:** Although you are welcome to use a computer during lectures and tutorial periods, you are expected to use the computer for scholastic purposes only, and refrain from engaging in any activities that may distract other students from learning. Please be respectful to your

Submitting a Self-Reported Absence (see below for conditions)

For medical absences exceeding 48 hours, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to their Academic Counselling in their Faculty of registration in order to be eligible for Academic Consideration; or

For non-medical absences exceeding 48 hours, submitting appropriate documentation (e.g., obituary, police report, accident report, court order, etc.) to Academic Counselling in their Faculty of registration in order to be eligible for academic consideration. Students are encouraged to contact their Academic Counselling unit to clarify what documentation is appropriate.

Students seeking academic consideration **must communicate with their instructors no later than 24 hours** after the end of the period covered by either the self-reported absence or SMC, or immediately upon their return following a documented absence.

**The following conditions are in place for self-reporting of medical or extenuating circumstances:**

- a. **a maximum of two self-reported absences** between September and April and one self-reported absence between 0 0.q0.000009lit

A+	90-100	<i>One could scarcely expect better from a student at this level</i>
A	80-89	<i>Superior work that is clearly above average</i>
B	70-79	<i>Good work, meeting all requirements and eminently</i>
C	60-69	<i>Competent work, meeting requirements</i>
D	50-59	<i>Fair work, minimally acceptable.</i>
F	below 50	<i>Fail</i>

Rounding of Grades (for example, bumping a 79 to 80%) is a practice some students request. **This practice will not occur here.** The edges of this course are clear. The mark attained is the mark you

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## **7. Student Code of Conduct**

The purpose of the Code of Student Conduct is to define the general standard of conduct expected of students registered at Western University, provide examples of behavior that constitutes a breach of this standard of conduct, provide examples of sanctions that may be imposed and set out the disciplinary procedures that the University will follow. For more information, visit