

Western University
Faculty of Health Sciences
School of Kinesiology

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

<p>Instructor: Daniel Keir Office: Arts & Humanities Bldg Rm 3G18 Email: dkeir@uwo.ca Phone: (519) 661-2111 x 87962 Office Hrs: Thurs 10:00 – 11:00 am (Zoom)</p> <p>LABS Instructor: Michael Herbert Office: Arts & Humanities Bldg Rm 3G04 Email: mherber5@uwo.ca Phone: (519) 661-2111 x 88675 Office Hrs: By appointment</p> <p>TAs: TBA</p>	<p>Lectures: Mon 8:30 - 9:30 am Classroom: SH-2355 Delivery type: In person</p> <p>Laboratory: AHB1R43</p> <table> <tr><td>002</td><td>Mon</td><td>2:30 PM - 4:30 PM</td><td>AHB 1R43</td></tr> <tr><td>003</td><td>Wed</td><td>4:30 PM - 6:30 PM</td><td>AHB 1R43</td></tr> <tr><td>004</td><td>Fri</td><td>12:30 PM - 2:30 PM</td><td>AHB 1R43</td></tr> <tr><td>005</td><td>Mon</td><td>2:30 PM - 4:30 PM</td><td>AHB 3R07</td></tr> <tr><td>006</td><td>Wed</td><td>4:30 PM - 6:30 PM</td><td>AHB 3R07</td></tr> <tr><td>007</td><td>Fri</td><td>12:30 PM - 2:30 PM</td><td>AHB 3R07</td></tr> <tr><td>008</td><td>Tue</td><td>9:30 AM - 11:30 AM</td><td>AHB 1R43</td></tr> <tr><td>009</td><td>Tue</td><td>9:30 AM - 11:30 AM</td><td>AHB 3R07</td></tr> </table>	002	Mon	2:30 PM - 4:30 PM	AHB 1R43	003	Wed	4:30 PM - 6:30 PM	AHB 1R43	004	Fri	12:30 PM - 2:30 PM	AHB 1R43	005	Mon	2:30 PM - 4:30 PM	AHB 3R07	006	Wed	4:30 PM - 6:30 PM	AHB 3R07	007	Fri	12:30 PM - 2:30 PM	AHB 3R07	008	Tue	9:30 AM - 11:30 AM	AHB 1R43	009	Tue	9:30 AM - 11:30 AM	AHB 3R07
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NOTE: All course information including grades, assignment outlines, deadlines, etc. are available via OWL. Check the website regularly for course announcements.

Calendar Course Description (including prerequisites/anti-requisites):

This course focuses on experiments designed to highlight the physiological response to exercise and to introduce basic techniques for fitness evaluation.

Prerequisite(s): [Kinesiology 2230A/B](#). Priority to BSc Honours Specialization Kinesiology students. **Corequisite(s):** [Kinesiology 3337A/B](#).

Extra Information: 2 laboratory hours, 1 tutorial hour.

You are responsible for ensuring that you have successfully completed all course pre-requisites, and that you have not taken an anti-requisite course.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

NOTE: If you wish to enroll in this course without the stated pre-requisite(s), you must obtain written approval from the course instructor. The approval should then be forwarded to your academic counsellor.

1. Course Description

The most important requirement for exercise performance is the transport of oxygen (O₂) to support the bioenergetic processes in muscle cells and elimination of carbon dioxide (CO₂) 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 O₂ uptake, O₂ 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-up and submitted as portions of “manuscript-style” reports. Students will 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 will be utilized when students submit two full “manuscript-style” lab reports.

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).
4. Use incremental exercise to identify exercise thresholds and explain the underlying physiological mechanisms that produce those thresholds.
5. Apply exercise testing and exercise prescription to elicit targeted physiological and metabolic responses to exercise (i.e., accurately control exercise intensity).
6. Communicate scientific information in a written report – i.e., describe and report data and findings collected in a laboratory setting and explain and compare these responses using information (i.e., data, ideas) from the published literature.

3. Schedule

3.1 Lecture

Lecture Week	Lecture Topic
1	Introduction to laboratory in exercise physiology
2	Exercise intensity, duration, and energy systems
3	Oxygen uptake (VO ₂)
4	Aerobic exercise prescription
5	THANKSGIVING
6	Incremental exercise and non-invasive exercise thresholds
7	Preparing a scientific manuscript
8	Blood lactate
9	Critical power

10	Considerations for preparing a “results” section
11	READING WEEK
12	Laboratory determinants of performance
13	REVIEW FOR FINAL EXAM

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 13th. 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.

Lab Assignments	Value: 30%	Dates: See below
Lab Assignment #1	10% analysis and interpretation of data collected in Labs #2 & 3 <ul style="list-style-type: none"> • <u>due:</u> October 22 	
Lab Assignment #2	5% Analysis and interpretation of data collected in Lab #4 <ul style="list-style-type: none"> • <u>due:</u> November 8 	
Lab Assignment #3	5% Analysis and interpretation of data collected in Lab #5 <ul style="list-style-type: none"> • <u>due:</u> November 26 	
Lab Assignment #4	10% Analysis and interpretation of data collected in Lab #6 & 7 <ul style="list-style-type: none"> • <u>due:</u> December 8 	
Manuscript	Value: 45%	Dates: see below
Mini report: Introduction	5% Draft of manuscript introduction <ul style="list-style-type: none"> • <u>due:</u> September 29 	
Mini report: Methods	5% Draft of manuscript methods <ul style="list-style-type: none"> • <u>due:</u> October 14 	
Mini report: Results	5% Draft of manuscript results <ul style="list-style-type: none"> • <u>due:</u> October 28 	
Scientific Manuscript	30% Complete draft of scientific manuscript <ul style="list-style-type: none"> • <u>due:</u> November 25 	
Laboratory Exam	Value: 25%	Date: TBA
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. <ul style="list-style-type: none"> • Analysis of exercise data accompanied by short answer interpretations. • To be scheduled during exam period. 	

All assignments will be posted on OWL well in advance of their corresponding deadlines.

Due dates for assignments are listed in the course syllabus and on OWL. Electronic copies of lab assignments are to be submitted on OWL. Assignments must be submitted no later than 11:59 pm on the specified due date. Assignments will not be accepted late, except under medical or other compassionate circumstances. Submitting a late assignment without appropriate documentation will result in a zero (0) grade. A missed mid-term examination, without appropriate documentation will result in a zero (0) grade. Acceptable reasons might include hospital stays, serious illness, family emergencies (like serious accidents, illness, or death) or similar circumstances.

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 “arrive” to class on time
- 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
- please be prepared to turn your video camera off at the instructor’s request if the internet 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:

- if you wish to speak, use the “chat” 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)

General considerations of “netiquette”:

- 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. “Flaming” is never appropriate.
- 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

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 fellow students and turn the sound off. If the professor receives complaints from other students regarding noise or other disruptive behavior (e.g. watching videos on YouTube.com, updating your Facebook status, playing Solitaire), your classroom privileges will be revoked. From time to time, your professor may ask the class to turn off all computers, to facilitate learning or discussion of the material presented in a particular class. Unless explicitly noted otherwise, you may not make audio or video recordings of lectures – nor may you edit, re-use, distribute, or re-broadcast any of the material posted to the course website.

3. Health and Wellness:

Information regarding health and wellness-related services available to students may be found at <http://www.health.uwo.ca/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (<http://www.health.uwo.ca/>) for a complete list of options about how to obtain help.

4. Support Services

There are various support services around campus. These include, but are not limited to:

- *Student Development Centre* -- <http://www.sdc.uwo.ca/ssd/>
- *Student Health & Wellness* -- <http://www.health.uwo.ca/>
- *Registrar's Office* -- <http://www.registrar.uwo.ca/>
- *Ombudsperson Office* -- <http://www.uwo.ca/ombuds/>

5. Documentation for Academic Accommodation (Illness, Medical/Non-Medical Absences):

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_12

Students who experience an extenuating circumstance (illness, injury, or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

- 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 May and August;
- b. any absences in excess of the number designated in clause a above will require students to present a Student Medical Certificate (SMC) or appropriate documentation supporting extenuating circumstances to the Academic Counselling unit in their Faculty of registration no later than two business days after the date specified for resuming responsibilities.
- c. The duration of the excused absence will be for a maximum of 48 hours from the time the Self-Reported Absence form is completed through the online portal, or from 8:30 am the following morning if the form is submitted after 4:30 pm;
- d. The duration of the excused absence will terminate prior to the end of the 48-hour period should the student undertake significant academic responsibilities (write a test, submit a paper) during that time;
- e. The duration of an excused absence will terminate at 8:30 am on the day following the last day of classes each semester regardless of how many days of absence have elapsed;
- f. Self-reported absences will not be allowed for scheduled final examinations; for midterm examinations scheduled during the December examination period; or for final lab examinations scheduled during the final week of term;
- g. Self-reporting may not be used for assessments (e.g. midterm exams, tests, reports, presentations, or essays) worth more than 30% of any given course;

For medical and non-medical absences that are not eligible for self-reporting Kinesiology students must submit an Academic Consideration Request form found online https://www.uwo.ca/fhs/kin/undergrad/files/accommodation_request.pdf in addition to an SMC or appropriate documentation in the event of a non-medical absence. These documents will be retained in the student's file, and will be held in confidence in accordance with the University's Official Student Record Information Privacy Policy.

6. Grades:

Where possible assignment objectives and rubrics will be posted on OWL. Should you have a concern regarding the grade you received for an assignment or feel that it is unfair in any way, you must wait 24 hours from the receipt of the assignment to approach the instructor or TA. In doing so, please make an appointment and prepare in writing, with evidence, why you feel your grade is inappropriate. Please be aware that in requesting a grade reassessment, your grade could go up/down/or stay the same. Note that calculations errors (which do occur!) should be brought to my attention immediately.

Generally, students can expect some form of feedback on their performance in a course before the drop date.

- November 12th, 2020 (for first term half-courses)
- November 30th, 2020 (for full-year courses)
- March 7th, 2021 (for second term half-or full year courses)

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 achieved and the mark assigned; there is no rounding to the next grade level, or 'giving away' of marks. Please don't ask me to do this for you; the response will be "please review the course outline where this is presented".

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 <https://www.uwo.ca/univsec/pdf/board/code.pdf>