

Western HealthSciences

School of Kinesiology

KIN 2230A – Introductory Exercise Physiology Fall 2025

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Lab Instructor: Michael Herbert
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Office Hours: TBA

TAs: TBD

Instruction Mode: Blended:
2h/week in-person lecture
1h/week virtual asynchronous lecture
2h/every second week in-person lab

Lectures:
Tuesdays 12:30-2:20
Thursdays Virtual (asynchronous)

Laboratories: in-person: TH3103

Section	Day	Time
002 & 007	Tuesday	8:30-10:30
003 & 008	Tuesday	10:30-12:30
004 & 009	Wednesday	8:30-10:30
005 & 010	Tuesday	2:30-4:30
006 & 011	Tuesday	4:30-6:30

NOTE: This course will be run through OWL Brightspace. All course information including grades, assignment outlines, deadlines, etc. are available via OWL Brightspace. Check the website regularly for course announcements, and consider downloading the Brightspace Pulse App.

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

The physiological basis of muscular exercise and training. The course will examine metabolic, cardiorespiratory and muscular adaptations to acute and chronic exercise.

Prerequisite(s): Grade 12U Biology or equivalent, and Physiology 1021 or equivalent with a minimum grade of 60%.

Extra Information: 3 lecture hours, 2 laboratory hours biweekly.

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

Statement on Prerequisite Checking

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.

My Course Description:

Dynamic exercise (driven by muscle contraction) imposes a **demand** for energy that is proportional to both the force and rate at which the muscle contracts. To match energy **supply** to energy demand, the body enlists coordinated adjustments of the neural, respiratory, cardiovascular, hormonal, and muscle metabolic systems. Each of these systems is adaptable through chronic exercise (training) or deconditioning (through disease or inactivity) and it is the capacity and cooperation of these physiological systems that determine performance. This course will introduce this “**energy demand versus energy supply**” relationship with specific reference to how energy supply is maintained (or not (that’s when it gets most exciting)) at various exercise demands (intensities and durations).

Learning Outcomes:***Upon successful completion of this course, students will be able to:***

1. Explain how muscle contracts at the cellular and whole-body levels.
2. Describe the impact of muscle contraction on energy demand and explain how energy is stored in muscle.
3. Describe in detail the contribution of energy systems in meeting energy supply.
4. Describe how physical activity impacts energy expenditure, and the impacts on body composition.
5. Describe in detail the physiological systems connecting the atmosphere to the muscle mitochondria and their independent and integrative roles in oxygen supply and carbon dioxide removal during exercise.
6. Describe the basics of how breathing and blood flow are regulated with changes in exercise demand and how both may be challenged during near-maximal exercise.
7. Define exercise intensity based on “intensity domains” and describe/identify the unique physiological response profiles at each intensity.
8. Explain the short-term physiological consequences when energy supply is not sufficient for energy demand.
9. List the limiting factors during exercise performance and describe how chronic training (or factors like doping) improves exercise performance or capacity.
10. Apply principles of physiology and exercise to understand differences between performance demands and to estimate performance capabilities.
11. Describe key variables for exercise appraisal, and collect, analyze, and interpret exercise test data.

Course Schedule:**Lectures:**

Each week there will be ~2.5 hours of lecture. The first ~1.5 hours will be delivered in-person on Tuesdays (Location and time TBD) (i.e., synchronous). The additional ~1 hour will be posted online on Thursdays (i.e., asynchronous). The following is a tentative schedule of content. Specific topics and the specific weeks in which they are delivered may change.

Week	Lecture	Synchronous Lecture	Asynchronous Lecture	Dates
1	Lecture 1	-	Homeostasis and Equilibrium	September 4
2	Lecture 2+3	Skeletal Muscle Physiology	The Chicken vs the Duck	September 9, 11
3	Lecture 4+5	Muscle Metabolism – Out in the Cytosol	Superman or Voldemort	September 16, 18
4	Lecture 6+7	Muscle Metabolism – Into the Mitochondria	On the Substrate and Narrow	September 23, 25
5	Lecture 8+9	Energy Expenditure**	The F-Word	September 30**, October 2
6	Lecture 10+11	Biomechanics for Dummies	What are you Made of?	October 7, 9
7	Lecture 12+13	Maximal Oxygen Uptake	Haywire Hormones	October 14, 16
8	-	Midterm	<i>No virtual lecture</i>	October 21
9	Lecture 14+15	Exercise Thresholds	Breathe it in	October 28, 30
Reading Week			November 3-9	
10	Lecture 16+17	The Heart of Ex Phys	Go with the Flow	November 11, 13
11	Lecture 18+19	Hungry Hungry Muscles	The Physiological Symphony	November 18, 20
12	Lecture 20+21	Take it to the Limit	The Zoo-lympics	November 25, 27

13	Lecture 22+23	Performance Enhancing Drugs	Choose your Own Adventure	December 2, 4
14	Lecture 24	Course Review	<i>No virtual lecture</i>	December 9

****Lecture 8 will be posted as a virtual asynchronous lecture in observation of NDT&R**

Labs:

Each lab runs for 2 weeks. **You attend one lab every two weeks.** Lab section numbers correspond to whether it is scheduled in Group one or two:

- Group 1 sections 002, 003, 004, 005, and 006;
- Group 2 sections 007, 008, 009, 010, and 011.

You should expect to do physical activity/exercise in labs. **You are welcome to wear whatever you feel most comfortable doing physical activity in**, (shorts or gym pants/leggings, and t-shirts, or any clothing that you feel comfortable being active/moving in), as long as you can be physically active. Please also wear **indoor running/gym/cross-training/tennis/athletic shoes**. Data collected in your lab will be needed to complete each of the lab assignments.

The experiential learning associated with the practical laboratory experiences is an important part of the learning outcomes for this course. It is essential that all students enrolled in this course attend and engage in laboratory content, in real time. **Thus, lab attendance is mandatory and if you do not attend a lab, you will automatically receive a grade of “zero” on the lab assignment for that lab.** If a lab is missed with approved consideration then students must get caught up on the material they missed. Missing a lab does not excuse you from missing an assignment deadline (unless the deadline is *also* included in the accommodation).

Lab	Date	Lab Topic
1	Group 1: September 16 th and 17 th Group 2: September 23 rd and 24 th	Muscle force-velocity relationship
2	Group 1: October 7 th and 8 th Group 1: October 14 th and 15 th	Critical power
3	Group 1: October 28 th and 29 th Group 1: November 11 th and 12 th	Introduction to measuring gas exchange
4	Group 1: November 18 th and 19 th Group 2: November 25 th and 26 th	Muscle oxygen delivery and utilization

Students wishing to discuss lab tutorial and assignment marks must first contact their graduate teaching assistant. If further discussion is required, students may attend the lab coordinator's (Michael Herbert) office hours. Office hours will be posted in the OWL calendar and offered weekly throughout the term, both in person and via Zoom. *ALL electronic correspondence regarding lab evaluation marks, sent to the lab coordinator, will be deleted immediately.*

If a student receives an academic consideration, they are to submit their assignment within 24 hours of the considerations time elapsing (e.g. If the consideration ends February 20 at 11:59 pm, the assignment must be submitted by February 21 at 11:55).

Required Course Material and Costs:

There is no textbook for the course and no additional expenses.

Course Evaluation:

Due dates are provided below and will be communicated on OWL Brightspace. Assigned work, including formal assignments and lab work documentation are due as communicated below and in OWL Brightspace. Assignments are due before the date and time listed. ***Failure to submit assignments by posted due dates and times will result in a late penalty of 10% per day.*** Assignments will not be accepted after class feedback/grades have been released.

Assessment	Weight	Date
Pre-Lab Quizzes	4%	Ongoing (Tuesday the week of each lab)

Laboratory Assignments	32%	Oct 3, Oct 24, Nov 21, Dec 5
Midterm Exam	29%	October 21
Final Exam	35%	Scheduled by Registrar
Total	100%	

Pre-Laboratory Quizzes (1% each, total of 4%): Students will be expected to prepare for their laboratory sessions by reading the assigned readings and protocols. Pre-laboratory quizzes will assess the students' basic understanding of the concepts as well as the protocols to be completed in-lab. Quizzes will be completed through OWL Brightspace and will be due the Tuesday on the week of their laboratory session:

Group 1: Sept 16, Oct 7, Oct 28, Nov 18

Group 2: Sept 23, Oct 14, Nov 11, Nov 25.

Laboratory Assignments (8% each, total of 32%): Students will complete assignments based on the analysis and interpretation of the data they collect in their laboratory sessions. The assignment outlines will be posted after the last section of Group 2 completes their laboratory. Assignments will include both consideration of student's own collected data and the theory behind what was expected to occur and the mechanisms for those physiological effects. Unexcused absences (those without formal academic considerations from a Kinesiology academic advisor) from laboratory sessions will result in a zero grade on the assignment for that lab.

Groups 1 **and** 2: Oct 3, Oct 24, Nov 21, Dec 5.

Midterm Exam (29%): The on-paper Midterm Exam will be comprised of multiple-choice questions and held during class time on October 21st. Students will have 90 minutes to complete the exam. The focus of the midterm exam will be on energy demand, covering Lectures 1-13 inclusive. A missed examination without appropriate documentation will result in a zero (0) grade. Following formal documentation, a make-up mid-term will be available on October 27th. Students unable to write the make-up midterm will have the weight of that test pushed to the final exam. ***The Midterm Exam is the designated assessment, meaning you cannot use an undocumented absence if you require consideration.***

Final Exam (35%): The Final Exam will be comprised of multiple-choice questions and will be scheduled by the registrar during the examination period. The Final Exam will be cumulative, but will have emphasis on the material since the midterm: energy supply. A missed examination without appropriate documentation will result in a zero (0) grade. Per University policy, makeup examinations for the final exam (i.e., during the December exam periods) are held on the second Thursday of January (for first-term courses).

Faculty of Health Sciences Academic Policies and Statements

Support Services

There are various support services around campus and these include, but are not limited to:

1. Academic Support and Engagement - <http://academicsupport.uwo.ca>
2. Wellness and Well-being - <https://www.uwo.ca/health/>
3. Registrar's Office -- <http://www.registrar.uwo.ca/>
4. Ombuds Office -- <http://www.uwo.ca/ombuds/>

The websites for Registrarial Services (<http://www.registrar.uwo.ca>), and the same for affiliated university colleges when appropriate, and any appropriate Student Support Services (including the services provided by the USC listed here: <http://westernusc.ca/services/>) and the Student Development Services, should be provided for easy access.

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

Statement on Gender-Based and Sexual Violence

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at: https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

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 behaviour 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>

Absence from Course Commitments

Students must familiarize themselves with the Policy on [Academic Consideration – Undergraduate Students in First Entry Programs](#)

Students missing course work for medical, compassionate, or extenuating circumstances can request academic consideration by completing a request at the central [academic consideration portal](#). Students are permitted one academic consideration request per course per term **without** supporting documentation. Note that supporting documentation is **always** required for academic consideration requests for examinations scheduled by the office of the registrar (e.g., December and April exams) and for practical laboratory and performance tests (typically scheduled during the last week of the term).

Students should also note that the instructor may **designate** one assessment per course per term that requires supporting documentation. This designated assessment is described elsewhere in this document. Academic consideration requests may be denied when flexibility in assessment has already been included. Examples of flexibility in assessment include when there are assessments not required for calculation of the final grade (e.g. 8 out of 10 quizzes), when there is flexibility in the submission timeframe (e.g. 72 hour no late penalty period), or when timed assessments (e.g., quizzes) are available over an extended period of time (e.g., when you are given a 72 hour time period to start – and finish – the assessment).

Please note that any academic considerations granted in this course will be determined by the instructor of this course, in consultation with the academic advisors in your Faculty of Registration, in accordance with information presented in this course syllabus. Supporting documentation for academic considerations for absences due to illness should use the [Student Medical Certificate](#) or, where that is not possible, equivalent documentation by a health care practitioner.

Accommodation for Religious Holidays

Students should review the policy for [Accommodation for Religious Holidays](#). Where a student will be unable to write examinations and term tests due to a conflicting religious holiday, they should inform their instructors as soon as possible but not later than two weeks prior to writing the examination/term test. In the case of conflict with a midterm test, students should inform their instructor as soon as possible but not later than one week prior to the midterm.

Special Examinations

A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents. To provide an opportunity for students to recover from the circumstances resulting in a Special Examination, the University has implemented Special Examination dates. The Faculty of Health Sciences has set School-specific dates for these Special Examinations. Please speak with your instructor about the date on which the Special Examination for this course will be held.

Academic Offences

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following website: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Plagiarism

Student work is expected to be original. Plagiarism is a serious academic offence and could lead to a zero on the assignment in question, a zero in this course, or your expulsion from the university. You are plagiarizing if you insert a phrase, sentence or paragraph taken directly from another author without acknowledging that the work belongs to him/her. Similarly, you are plagiarizing if you paraphrase or summarize another author's ideas without acknowledging that the ideas belong to someone else. All 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 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 (www.turnitin.com).

Use of Artificial Intelligence for the Completion of Course Work

Within this course, you may only use artificial intelligence tools (e.g., "ChatGPT") in ways that are specifically authorized by the course instructor. All submitted work must reflect your own thoughts and independent written work.

Re-submission of Previously Graded Material

Without the explicit written permission of the instructor, you may not submit any academic work for which credit has been obtained previously, or for which credit is being sought, in another course or program of study in the University or elsewhere.

Use of Statistical Pattern Recognition on Multiple Choice Exams

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.

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Accessible Education (AE) at 661-2111 x 82147 for any specific question regarding an accommodation or review [The policy on Accommodation for Students with Disabilities](#)

Correspondence Statement

The centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner. Students are further expected to attend to announcements presented through Brightspace, and to read emails generated in this way.

Use of Electronic Devices

During Exams

Unless you have medical accommodations that require you to do so, or explicit permission from the instructor of the course, you may not use any electronic devices (e.g., cell phones, tablets, cameras, smart glass, smart watches, or iPods) during ANY tests, quizzes, midterms, examinations, or other in-class evaluations. **These devices MUST either be left at home or with your belongings at the front of the room. They MUST NOT be at your test/exam desk or in your pocket. Any student found with a prohibited device will receive an automatic grade of zero on the test or exam.**

During Lectures and Tutorials

Although you are welcome to use a computer during lecture 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. 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.

Copyright and Audio/Video Recording Statement

Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws. 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.

Contingency Plan for an In-Person Class Pivoting to 100% Online Learning

In the event of a situation that requires this course to pivot to online content delivery, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on Brightspace for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

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.

Online Proctoring

Tests and examinations in this course may be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at: <https://remoteproctoring.uwo.ca>.

Grades

Where possible assignment objectives and rubrics will be posted on OWL.

Rounding of Grades

This is a practice some students request (for example, bumping a 79 to 80%). The final grade documented is the grade that you have achieved. 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."

University-wide Grade Descriptions

A+	90-100	<i>One could scarcely expect better from a student at this</i>
A	80-89	<i>Superior work that is clearly above average</i>
B	70-79	<i>Good work, meeting all requirements and eminently satisfactory</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>

Appealing a Grade Within this Course:

You have the right to appeal any grade within this course. The grounds for a grade appeal may be one or more of: medical or compassionate circumstances, extenuating circumstances beyond the student's control, bias, inaccuracy, or unfairness. All grounds advanced in a request for relief must be supported by a clear and detailed explanation of the reasons for the request together with all supporting documentation.

Appeals generally proceed in this order:

1. Course instructor (informal consultation)
2. Department Chair (submission of written request)
3. The Dean of the Faculty (submission of written request)

In the case of perceived procedural unfairness, steps 2 and 3 are carried out within the Department and Faculty offering the course. In the case of extenuating medical or compassionate circumstances that impact on a grade, steps 2 and 3 are carried out within a student's Home Department and Faculty.

A request for relief against a mark or grade must be initiated with the instructor as soon as possible after the mark is issued. In the event that the instructor is not available to the student, or fails to act, or if the matter is not resolved satisfactorily with the instructor, a written request for relief must be submitted to the Chair of the Department within three weeks of the date that the mark was issued. In the case of a final grade in a course, the written request for relief must be submitted to the Chair of the department by January 31st (for first-term half courses) or June 30th (for second-term half courses or full-year courses).