

# Western HealthSciences

## Kinesiology 4360B Integrative Exercise Physiology Winter 2027

### Campus Supports

Western University is committed to a **thriving campus**. For help with:

- Both physical and mental health, go to [Wellness & Wellbeing](#)
- Studying with disabilities, go to [Accessible Education](#)
- Writing skills, go to the [Writing Support Centre](#)
- Learning skills and strategies, go to [Learning Development & Success](#)
- Contacting the ombudsperson, go to the [Office of the Ombudsperson](#)



Your course coordinator can also **guide you** to available campus resources and/or services.

### Technical Requirements

 Laptop computer

### Contact Information

*Table 1: Course coordinator information*

| Course Coordinator/instructor | Contact Information | Office Hours   |
|-------------------------------|---------------------|----------------|
| J. Kevin Shoemaker            | kshoemak@uwo.ca     | By appointment |

*Table 2: Teaching assistants' information*

| Teaching Assistant(s) | Contact Information | Office Hours |
|-----------------------|---------------------|--------------|
| TBD                   | TBD                 | TBD          |

**NOTE:** All course information including grades, assignment outlines, deadlines, etc. are available via [OWL Brightspace](#). Download the Brightspace Pulse App to stay up-to-date on course communication and enable your notification settings within “Communications” in the top toolbar. Check the website regularly for course announcements. If you need assistance, visit [OWL Brightspace Help](#) or contact the [Western Technology Services Helpdesk](#). They can be contacted by phone at 519-661-3800 or ext. 83800.

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

A study of how muscular, neural, cardio-vascular and respiratory systems are integrated during exercise to regulate blood pressure and blood flow in health and disease. Students will develop a deeper understanding of how these physiological systems are integrated to support adaptation to exercise.

**Prerequisite(s):** [Kinesiology 2230A/B](#), [Kinesiology 3330F/G](#).

**Extra Information:** 3 lecture hours.

*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.**

### **Course Description:**

The ability to perform a range of physical activity depends on a wonderful but complex integration of physiological systems. This course examines the acute and chronic adaptations to, and integration of, cardio-vascular, respiratory, oxygen-carrying and neural systems to support the stress of muscular work. These systems will be studied in terms of their discrete physiology as well as how they are integrated across levels of physical stress. Additional cross-cutting topics that affect this integration will be considered as well. These may include age, sex, disease, inactivity and training. Students will develop a deeper understanding of how physiological systems integrate to form a response to stress, and how this integration varies depending on the context in which the exercise (or other physiological stressors) is being performed.

### **Delivery Mode: [in-person]**

*Table 3: Date and times of course components*

| Component               | Date(s)    | Time |
|-------------------------|------------|------|
| Lecture                 | M/T/W/Th/F | TBD  |
| Review/Tutorial/Lecture | M/T/W/Th/F | TBD  |

### **Learning Outcomes**

Upon successful completion of this course, you will be able to:

1. Describe in detail the physiological systems connecting the atmosphere to the muscle mitochondria and their independent and integrative roles in oxygen delivery
2. Draw relationships between key variables associated with respiratory, cardiac and vascular physiology change with increasing exercise intensity
3. Describe the role and control mechanisms affecting blood pressure and blood flow changes with exercise.
4. Integrate the brain's role in cardiovascular adaptation to exercise through its integration of central, sensory and efferent autonomic neural patterns.
5. Describe the pathophysiology of exercise limitations caused by diseases of the cardiovascular, respiratory and musculoskeletal systems and distinguish these from normal physiological responses to exercise.

### **Course Content and Schedule**

Each week, approximately two hours will be spent in lecture and one hour in review of that lecture with content that focuses on applied examples and/or on student submissions to the Instructor of lecture elements that were missed or poorly understood. These submissions can be made anonymously at the end of each lecture.

If no submissions are made, the Instructor will develop review questions.

Table 4: Course content and schedule (Examples only: Exact content may vary)

| Week | Dates         | Topic                                                                                        | Study material                      | Things due                          |
|------|---------------|----------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| 1    | Jan 4-8       | Lecture 1: Course Introduction and Basic Biophysics of Blood Flow                            | See readings aligned with Lecture 1 | Reflection Document                 |
| 2    | Jan 11-15     | Lecture 2: Pulmonary Function and Limitations to Exercise                                    | Readings aligned with Lecture 2     | Reflection Document                 |
| 3    | Jan 18-22     | Lecture 3: Oxygen Delivery: Determinants of Cardiac Function/Cardiac Limitations to Exercise | Readings aligned with Lecture 3     | Reflection Document                 |
| 4    | Jan 25-29     | Lecture 3: Oxygen Delivery: Vasodilation, Muscle Blood Flow                                  | Readings aligned with Lecture 3     | Reflection Document                 |
| 5    | Feb 1 – Feb 5 | Lecture 3: Oxygen Delivery: Vasodilation, Muscle Blood Flow                                  | Readings aligned with Lecture 3     | Reflection Document                 |
| 6    | Feb 8-12      |                                                                                              |                                     | Midterm 1                           |
| 7    | Feb 15-19     | Reading Week                                                                                 | N/A                                 |                                     |
| 8    | Feb 22-26     | Lecture 4: Vasoconstriction and BP Control: Introduction                                     | Readings aligned with Lecture 4     | Reflection Document                 |
| 9    | Mar 2-6       | Lecture 4: Vasoconstriction and BP Control: Baroreflex                                       | Readings aligned with Lecture 4     | Reflection Document                 |
| 10   | Mar 9-13      | Lecture 4: Vasoconstriction and BP Control: Metaboreflex                                     | Readings aligned with Lecture 4     | Reflection Document<br>Assignment 1 |
| 11   | Mar 15-19     | Lecture 5: Central Command (role of the brain)                                               | Readings aligned with Lecture 5     | Reflection Document                 |
| 12   | Mar 22-26     | Lecture 6: Sympatholysis: The tension between blood pressure and blood flow during exercise  | Readings aligned with Lecture 6     | Reflection Document                 |
| 13   | Mar 29-Apr 2  | Lecture 7: Exercise training bradycardia                                                     | Readings aligned with Lecture 7     | Reflection Document                 |
| 14   | Apr 5-8       | Lecture 8: Cerebrovascular Control                                                           |                                     | Reflection Document                 |

**\*Note: This is a tentative list of topics. The topic, timing, and/or order may change.**

**Required Course Material/Text: There is no required textbook for this course. Any required readings will be posted on Brightspace**

#### **Course Materials You Must Acquire**

Course materials, including course outline, readings and lecture notes, are available on the Brightspace course site. Past exams or exam questions are not available. The material in these readings will form the basis for, or supplement, the lecture presentations and their content

will be considered in examinations.

## **Assessments and Evaluation**

Below is the evaluation breakdown for the course. Any deviations will be communicated.

*Table 5: Assessments' details*

| Assessment                              | Format                                                                                                                            | Weight                           | Due Date                                                     | Flexibility                 | Learning Objective |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------|-----------------------------|--------------------|
| Midterm Test<br>(designated assessment) | Mixed format; In person, on paper during class time. This is a designated assessment and must receive document for considerations | 30                               | Feb 8-12                                                     | Not applicable              | 1,2,3              |
| Weekly Reflection Documents             | One page: Summary of lecture, most interesting point, most confusing component                                                    | 20 (2% of total grade each week) |                                                              | 10 of 12 must be submitted. | 1,2,3,5            |
| Assignment                              | Written                                                                                                                           | 10                               | Approved by March 1, 2027<br><br>Submitted by March 20, 2027 | 72-hour no late penalty     | 1,2,4,5            |
| Final Exam                              | Mixed format                                                                                                                      | 40                               | TBD                                                          | Not applicable              | 1, 2, 3            |

### **Notes:**

### **Assignments:**

**Reflection Documents:** (due at midnight each Friday during the course). Length of these documents will be one page maximum. Paragraph 1 will provide a concise summary of the lecture content. Paragraph 2 will highlight what you thought was the most interesting/compelling aspect of the content. Paragraph 3 will highlight what you found to be most confusing in the lecture. This last paragraph will inform the Instructor of content that might need reviewing. Weight: 2% of total grade each week. 10/12 reflection documents are required for the maximum total of 20%. If you miss a reflection, the score will be recorded as zero and, if it is one of two zeros, it will be dropped from the final reflection score calculation. If a student misses more than two reflections with approved academic considerations, the weight of that reflection will be distributed across completed reflections. If all reflections are missed with approved considerations, the weight will be added to the final exam.

**Written Assignment:** (One assignment, worth 10% of the total grade): Students will choose a topic related to a controversial or confusing topic in exercise physiology, cerebrovascular physiology or neural control of the circulation as it pertains to exercise. A minimum of 3 primary, peer-reviewed journal articles is required. The paper will be no more than 2 typed pages (single-spaced), 12-point

font, maximum of one inch border widths. References will be cited properly in the document narrative and provided in full an additional page.

Topics must be confirmed for use by the TA(s) or Instructor before you begin the assignment.

Deadlines: March 1, 2027 (23:59): Topic submitted for approval via Brightspace. March 20, 2027 (23:59): full assignment due and submitted through Brightspace. If you miss this approval or full submission dates without Academic Consideration, you will receive a score of zero. If you miss this assessment with Academic Consideration, the assignment dates will be rescheduled. If that revised date for full assignment submission is missed then you will receive a grade of zero for this assignment.

### General information about assessments

- ☒ All assignments are due at 23:59 EST unless otherwise specified
- ☒ Students are responsible for ensuring that the correct file version is uploaded; incorrect submissions including corrupt files could be subject to late penalties (see below) or a 0
- ☒ Written assignments will be submitted to Turnitin (statement in policies below)
- ☒ Students will have access to Turnitin reports before their submission is graded. Students may have 2 submissions to Turnitin.
- ☒ Group projects are expected to be a group effort. This means that all students in the group will receive the same grade. It also means that all students will receive the same penalty if any portion of the project is determined to be plagiarized.
- ☒ After an assessment is returned, students should wait 24 hours to digest feedback before contacting their evaluator; to ensure a timely response, reach out within 7 days
- ☒ Any grade appeals on term work must be initiated with the instructor within 3 weeks of the grade being posted. See the [University Policy on Undergraduate Student Appeals](#) for more information

The table below outlines University-wide grade descriptors.

*Table 6: University-wide grade descriptors*

| Letter grade | Number grade | Description                                                     |
|--------------|--------------|-----------------------------------------------------------------|
| A+           | 90-100       | One could scarcely expect better from a student at this level   |
| A            | 80-89        | Superior work which is clearly above average                    |
| B            | 70-79        | Good work, meeting all requirements, and eminently satisfactory |
| C            | 60-69        | Competent work, meeting requirements                            |
| D            | 50-59        | Fair work, minimally acceptable                                 |
| F            | below 50     | Fail                                                            |

### Rounding of Grades (for example, bumping a 79 to 80%)

This is a practice some students request. 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".

### Information about late or missed assessments:

- ☒ Students are expected to submit the two written assignments by the deadline listed. Should extenuating circumstances arise, students are permitted to submit their assignment up to 72 hours past the deadline without a late penalty. No Academic Consideration is required for this extension. Students submitting their assessment beyond the extended deadline will receive a zero grade on the assignment. Academic

Consideration requests may be granted only for extenuating circumstances that began before the deadline and lasted longer than the extension. Students must not provide medical or compassionate documentation to the instructor.

- ☑ Written Exams (70%): These include two exams each designed to be a maximum of 2 hours in duration. The exam format consists of multiple choice and short answer questions. Exams will be delivered in person. The Mid-Term exam will be delivered during class time. The makeup exam will be written 7-10 days following the stated exam date at a time that can be accommodated by the course Instructor or TAs. If the make-up exam is missed with approved consideration and documentation, the grade will be redistributed to the final exam (i.e. the final exam will be worth 70%). The final exam will be scheduled for 2 hours (date and time to be set by the registrar's office). Students who miss the final with approved consideration requests and documentation will write the Special Make-up exam on a pre-determined date in May 2027. If this is missed with approval, students must write with the next course offering. This could be a full year later and may have implications for graduation.

#### **Course-specific conditions:**

**INC (Incomplete Standing):** If a student has been approved by the Academic Advising Office (in consultation with the instructor/department) to complete term work at a later date, an INC will be assigned. Students with INC will have their course load in subsequent terms reduced to allow them to complete outstanding course work. Students may request permission from Academic Advising to carry a full course load for the term the incomplete course work is scheduled.

**SPC (Special examination):** If a student has been approved by the Academic Advising Office to write a Special Examination and the final exam is the only outstanding course component, an SPC will be assigned. If the class has a makeup exam, the student is expected to write the makeup exam. If the class doesn't have a makeup exam or the student misses the makeup exam for reasons approved by the Academic Advising Office, the student will write the exam the next time the course is offered. Outstanding SPCs will reduce the course load for the term the exam is deferred as outlined in [Types of Examinations](#) policy

### **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](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 ([https://registrar.uwo.ca/academics/academic\\_considerations/index.html](https://registrar.uwo.ca/academics/academic_considerations/index.html)). 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](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](http://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>.

## 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 31<sup>st</sup> (for first-term half courses) or June 30<sup>th</sup> (for second-term half courses or full-year courses)