

# Western HealthSciences

## School of Kinesiology

### KIN 3360B – Exercise Metabolism 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

 Stable internet connection       Laptop computer

#### Contact Information

| Course Coordinator/instructor | Contact Information                                  | Office Hours |
|-------------------------------|------------------------------------------------------|--------------|
| Dr. Jamie Melling             | <a href="mailto:jmelling@uwo.ca">jmelling@uwo.ca</a> | TBD          |

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

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

A study of human exercise metabolism with attention given to the major metabolic pathways and their control as they relate to acute and chronic responses and adaptations to exercise.

**Prerequisite(s):** [Physiology 1021](#) or equivalent; [Kinesiology 2230A/B](#). Restricted to students registered in Kinesiology.

**Extra Information:** 3 lecture hours. Note: This course is taught by the School of Kinesiology. It does not fulfill any of the requirements for modules offered by the Department of Biochemistry.

*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.**

### **Delivery Mode: In person**

| Component | Days  | Time            | Location |
|-----------|-------|-----------------|----------|
| Lecture   | M/W/F | 11:30am-12:30pm | FNB-1220 |

### **My Course Description**

This course will describe the major metabolic pathways associated with the transport and storage of substrate, and production of “energy equivalents” at rest and during different durations and intensities of exercise, as well as in other physiological or clinical conditions. In addition to describing individual steps in the pathways for carbohydrate and fat breakdown, utilization and synthesis, this course will examine regulation of these pathways in different tissues and in these various conditions, and how fuel use is integrated amongst tissues.

### **Learning Outcomes**

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

1. describe and explain the role of enzymes in metabolic pathways, and the different mechanisms by which they are regulated
2. describe and explain the bioenergetic requirements of muscle
3. describe and explain the relationship between metabolism and exercise performance
4. describe individual steps in each of the metabolic pathways studied and identify key steps where pathway regulation occurs and how “regulation” is achieved
5. describe and explain the metabolic responses to exercise of different intensity and duration
6. understand metabolic interactions amongst muscle and other tissue and organ systems
7. use examples from the published literature to help in the understanding of metabolic responses to exercise
8. understand the relationship between metabolism and certain disease states

### **Course Content and Schedule**

| Week | Dates     | Topic                                                                                                                    | Notes:           |
|------|-----------|--------------------------------------------------------------------------------------------------------------------------|------------------|
| 1    | Jan 4-8   | Course Introduction; Review: Amino Acid structure, peptides, and proteins; chemical interactions and acid- base balance. |                  |
| 2    | Jan 11-15 | Enzymes: structure, function and regulation.                                                                             |                  |
| 3    | Jan 18-22 | Energy systems and Bioenergetics                                                                                         |                  |
| 4    | Jan 25-29 | Energy systems and Bioenergetics (cont'd)                                                                                | Jan 27 Midterm 1 |
| 5    | Feb 1-5   | Carbohydrate (CHO) metabolism: glycolysis                                                                                |                  |

| Week | Dates        | Topic                                                                    | Notes:             |
|------|--------------|--------------------------------------------------------------------------|--------------------|
| 6    | Feb 8-12     | Carbohydrate (CHO) metabolism: glycolysis                                |                    |
| 7    | Feb 15-19    | Reading Week.                                                            | N/A                |
| 8    | Feb 22-26    | Carbohydrate (CHO) metabolism: gluconeogenesis and oxidation of pyruvate |                    |
| 9    | Mar 1-5      | Carbohydrate (CHO) metabolism: citric acid cycle                         |                    |
| 10   | Mar 8-12     | Carbohydrate (CHO) metabolism: oxidative phosphorylation.                | March 10 Midterm 2 |
| 11   | Mar 15-19    | Carbohydrate (CHO) metabolism: glycogenolysis                            |                    |
| 12   | Mar 22-26    | Carbohydrate (CHO) metabolism: glycogenesis                              |                    |
| 13   | Mar 29-Apr 2 | Fat Metabolism: Storage                                                  |                    |
| 14   | Apr 5-9      | Fat Metabolism: Breakdown and usage                                      |                    |

### Course Materials You Must Acquire and Their Costs

- PM Tiidus, AR Tupling, ME Houston. Biochemistry Primer for Exercise Science (5th ed). Human Kinetics, 2025.

## **Assessments and Evaluation**

### **Additional Course Material/Text:**

Lectures will be posted on OWL. Additional supplementary materials will be posted as well. No cost.

### **Course Evaluation:**

Midterm I (January 26, 2027-11:30am-12:20pm) = 30%

Midterm II (March 10, 2027-11:30am-12:20pm) = 30%

Final Exam (scheduled by the Registrar's office during the April examination period) = 40%

Exams will be a combination of multiple choice and short answer questions. Midterm examinations will be held during assigned lecture time. All exams are cumulative.

### **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
- ☒ 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.

| <b>Letter grade</b> | <b>Number grade</b> | <b>Description</b>                                              |
|---------------------|---------------------|-----------------------------------------------------------------|
| 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:**

Assignments are due as stated in the course syllabus and 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. If you miss a mid-term examination with appropriate documentation, the marks will be transferred to the next scheduled exam. All exams are cumulative.

**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](#). 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 academic considerations in this course are granted by the academic advisors in your home unit and implemented by the instructor of this course 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. If your absence relates to accommodations that are already supported by [Accessible Education](#), please work with your accessible education counsellor regarding your missed course work.

### **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.

### **Scholastic Offences**

Scholastic offences are taken seriously and students are directed to read the policy on [Scholastic Discipline for Undergraduate Students](#).

### **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](#). If you think you may qualify for ongoing accommodation (e.g. separate room to write exams, flexibility with deadlines, etc.) that will be recognized in all your courses, we encourage you to visit [Accessible Education](#) for more information.

### **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 be referred for investigation of a Scholastic Offence, per the policy listed above. The typical first-offence penalty for possession of a prohibited device is 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 request relief from any grade within this course. The grounds for a request for relief 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.

Requests based on procedural unfairness generally proceed in this order:

1. Course instructor (informal consultation)
2. Chair of the School offering the course (submission of written request)
3. Associate Dean of the Faculty offering the course (submission of written request)

Requests based on extenuating medical or compassionate circumstances generally proceed in this order:

1. Academic Advisor in your Home Unit
2. Associate Dean for your Home Faculty

A request for relief against a mark or grade must be initiated 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).