

Dept. of Physiology and Pharmacology
Physiology 4610A-Cardiovascular Physiology

Course Syllabus for Fall 2024



Western University is committed to a **thriving campus**; therefore, your health and wellness matter to us! The following link provides information about the resources available on and off campus to support students: <https://www.uwo.ca/health/> Your course coordinator can also **guide you** to resources and/or services should you need them.

1. Technical Requirements:



Stable internet connection



Laptop or computer

2. Important Dates:



Classes Begin	Reading Week	Classes End	Study day(s)	Exam Period
September 5	October 12–20	December 6	December 7–8	December 9–22

September 30, 2024, is National Day for Truth and Reconciliation and is a non-instructional day
December 2, 2024: Last day to withdraw from a first-term half course without academic penalty

3. Contact Information

Course Coordinator	Contact Information
Dr. Don Welsh	dwelsh@robarts.ca

Instructor(s)	Contact Information
Dr. Galina Mironova	gironov@uwo.ca
Dr. Paulina Kowalewska	pkowale@uwo.ca
Teaching Assistant	
TBA	

Course Description and Design

Delivery Mode: [in-person]

This course will cover physiological and pathobiological concepts of the cardiovascular system topics relevant to senior undergraduate students in the medical, engineering and biological sciences. Lectures will cover material from the cell-to-the-system level, with focus on structure/function relationships of the lungs, blood, heart and vasculature. To reinforce key physiological concepts, students will be introduced to clinically relevant examples in cardiovascular medicine. This course is also designed to immerse students in the current literature and exposed to them to active inquiry and critical thinking. They will be expected to work in groups, present recently published research and to outline the strengths and weaknesses of that material. Deep critical questioning is expected throughout the course and subject to grading.

Prerequisite: Physiology 3120

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.

Timetabled Sessions

Component	Date(s)	Time
Lecture	Fri	9:30 – 11:20

Attendance at sessions is expected

All course material will be posted to OWL: <https://westernu.brightspace.com/d2l/login>. Any changes will be indicated on the OWL site and discussed with the class.

If students need assistance, they can seek support on the [OWL Brightspace Help](#). Alternatively, they can contact the [Western Technology Services Helpdesk](#). They can be contacted by phone at 519-661-3800 or ext. 83800.

Current versions of all popular browsers (e.g., Safari, Chrome, Edge, Firefox) are supported with OWL Brightspace; what is most important is that you update your browser frequently to ensure it is current. All JavaScript and cookies should be enabled.

4. Learning Outcomes

After completing this course the student will understand the fundamentals of cardiovascular physiology and pathobiology, from the cell-to-the-whole organism. They will additionally garner rudimentary knowledge of tissue metabolism, and disease management. The latter will expose students to basic pharmacology, interventional cardiology and the use of implantable engineered devices. Students will further develop critical thinking and presentation skills through discussion of the current literature.

Specific Course Objectives: After completing this course, students will understand, at an appropriate level, the essentials of oxygen/substrate delivery, blood pressure regulation, lung function and gas exchange, cardiac/vascular electrophysiology and contractility, hemodynamics and blood flow regulation. They will also garner an understanding of key pathobiologic states and their treatment. Those states include but aren't limited to: pulmonary & systemic hypertension, angina,

heart failure, peripheral vascular disease, diabetes, stroke and myocardial infarction, and arteriosclerosis.

5. Course Content and Schedule

Week	Dates	Topic	Instructor
1	Sept 6	1: Course Outline and Assessment 2: Overview of Cardiovascular system 3: Blood, Erythrocytes and Buffers 4: Group Project and Dates	Lecture: DW
2	Sept 13	1: Lung, Anatomy and Physiology 2: Lung Mechanics and Ventilation 3: Lung Pathobiology 4: Mock Paper Presentation and Discussion	Lecture: DW Mock Paper: GM
3	Sept 20	1: Heart, Structure and Function 2: Modulation of Cardiac Output 3: Pathobiology 4: Mock Paper Presentation and Discussion	Lecture: DW Mock Paper: GM
4	Sept 27	1: Cardiac Myocyte, Structure and Function 2: Excitation-Contraction Coupling 3: Heart Pathobiology 4: Paper Presentation/Discussion (40 min)	Lecture: DW Paper: Group 1
5	Oct 4	1: Cardiac Action Potential 2: Electrical Conduction 3: Pathobiology 4: Paper Presentation/Discussion (40 min)	Lecture: DW Paper: Group 2
6	Oct 11	1: Cardiac EKG 2: Cardiac Arrhythmia 3: Paper Presentation/Discussion (40 min)	Lecture: DW Paper: Group 3
	Oct 12-20	Reading Week	N/A
All material prior to Reading Week will be on the midterm exam.			
7	Oct 25	Midterm Exam 30%	In class
8	Nov 1	1: Smooth Muscle Contraction 2: Electrophysiology and Ca ²⁺ Dynamics 3: Smooth Muscle Pathobiology 4: Paper Presentation/Discussion (40 min)	Lecture: DW Paper: Group 4
9	Nov 8	1: Endothelial Dependent Relaxation/Conduction 2: Endothelial Permeability 3: Pathobiology 4: Paper Presentation/Discussion (40 min)	Lecture: DW Paper: Group 5
10	Nov 15	1: Cerebral Circulation 2: Neurovascular Coupling 3: Pathobiology	Lecture: GM Paper: Group 6

		4: Paper Presentation/Discussion (40 min)	
11	Nov 22	1: Peripheral Vasculature & Microcirculation 2: Blood Flow Regulation 3: Pathobiology 4: Paper Presentation/Discussion (40 min)	Lecture: DW Paper: Group 7
12	Nov 29	1: Blood Pressure Regulation 2: Genesis of Hypertension 3: Treatment of Hypertension 4: Paper Presentation/Discussion (40 min)	Lecture DW Paper Group 8
13	Dec 6	TBA	
	Dec 9-20	Final Examination (30%)	<i>Date TBA</i>
All material from Oct 25 and onward will be on the final exam			

6. Participation and Engagement

- Students are expected to participate and engage with content as much as possible

7. Assessment and Evaluation

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

Assessment	Format	Weighting	Due Date
Group Paper Presentation/Discussion	Oral/in class	25%	*as scheduled
Class Participation	Throughout the term	15%	Throughout the term
Midterm exam	Written/in person	30%	Oct 25-In class
Final exam	Written/in person	30%	Dec 9-20 Date TBD

Designated Assessment: Instructors are permitted to designate one assessment per course per term as requiring supporting documentation to receive academic consideration. See below for information on academic consideration policy and missed course work. For this course, the following assessment has been designated as requiring supporting documentation:

- **Midterm exam**

There will be a group paper presentation (25%), a participation mark (15%: case study participation and paper discussion/participation) and a midterm (30%) and final exam (30%).

The research paper presentation entails 1 group per week (5-6 students) critiquing an up-to-date research paper. Total presentation time will be 40 minutes, with 20 minutes dedicated to a powerpoint presentation: 1) Background; 2) Objective/Hypothesis; 3) Methods; 4) Results/Discussion; 5) Strength/Weakness and 6) Future Direction. An additional 20 minutes is allocated for critical questions, which can be asked throughout, by students/instructors alike. In greater detail, each group will identify 3-5 recent research papers two weeks prior to presentation, from which the instructor will pick one. Those articles will be chosen from: 1) American Journal of Physiology; 2) Journal of Applied Physiology; 3) Journal of Physiology; and 4) ATVB, Circulation or Circulation Research.

Note student participation is expected throughout the course and will be graded at 15% (case study participation at 5% and paper discussion/participation at 10%).

The midterm and final exam are worth 30% each. The final exam will cover material from the midterm forward. Questions will be short answer and will ask student to draw diagrams, recite/extrapolate from lecture material and to design/critique experiments based on lecture notes/paper presentations.

General information about assessments

- 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
- Rubrics will be used to evaluate assessments and will be posted with the instructions
- A student might not receive the same grade as their group members if it is determined that the distribution of work was not equal
- 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 assignments, quizzes, or midterms must be received within 3 weeks of the grade being posted.
- 15% of your course grade will be evaluated and returned 3 days prior to the drop deadline (statement in policies below).

Click [here](#) for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.

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

Information about late or missed assessments:

- Late assessments without academic consideration will be subject to a late penalty **10 %/day**
- If a student with academic consideration is unable to participate in the group presentation, an alternate individual presentation assignment with questions will be scheduled
- One make-up test will be offered for students who miss the exam with academic accommodation
- If the midterm or final exam and the scheduled makeup exam is missed, then an INC will be recorded and student completes it the next time course is offered.

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.

8. Communication

- Students should check the OWL Brightspace site every 24–48 hours
- Students should email their instructor(s) and teaching assistant(s) using email.
- Emails will be monitored daily; students will receive a response in 24–48 hours
- Students should post all course-related queries on the discussion forum so that everyone can access the questions and responses

9. Office Hours

- Office hours will be held in person
- Office hours will be held Friday 12:00-2:00pm
- Office hours will be booked or drop in
- Office hours will be individual or group

10. Resources

- All resources will be posted in OWL Brightspace

11. Professionalism & Privacy

Western students are expected to follow the [Student Code of Conduct](#). Additionally, the following expectations and professional conduct apply to this course:

- All course materials created by the instructor(s) are copyrighted and cannot be sold/shared (e.g., Must Knows Facebook group, Course Hero, Chegg, etc.)
- Recordings are not permitted (audio or video) without explicit permission
- Permitted recordings are not to be distributed

Western is committed to providing a learning and working environment that is free of harassment and discrimination. All **students**, staff, and faculty have a role in this commitment and have a responsibility to ensure and promote a safe and respectful learning and working environment. Relevant policies include Western's [Non-Discrimination/Harassment Policy](#) (M.A.P.P. 1.35) and [Non-Discrimination/Harassment Policy – Administrative Procedures](#) (M.A.P.P. 1.35). Any **student**, staff, or faculty member who experiences or witnesses' behaviour that may be harassment or discrimination **must report the behaviour** to the Western's [Human Rights Office](#). Harassment and discrimination can be human rights-based, which is also known as EDI-based, (sexism, racism, transphobia, homophobia, islamophobia, xenophobia, antisemitism, and ableism) or non-human rights-based (personal harassment or workplace harassment).

12. How to Be Successful in this Class

Students enrolled in this class should understand the level of autonomy and self-discipline required to be successful.

1. Invest in a planner or application to keep track of your courses. Populate all your deadlines at the start of the term and schedule your time throughout the course.
2. Make it a daily habit to log onto OWL Brightspace to ensure you have seen everything posted to help you succeed in this class.
3. Follow checklists created on OWL Brightspace or create your own to help you stay on track.
4. Take notes as you go through the lesson material. Keeping handwritten notes or even notes on a regular Word document will help you learn more effectively than just reading or watching the videos.
5. Connect with others. Try forming an online study group and try meeting on a weekly basis for study and peer support.
6. Do not be afraid to ask questions. If you are struggling with a topic, check the online discussion boards or contact your instructor(s) and or teaching assistant(s).

- Reward yourself for successes. It seems easier to motivate ourselves knowing that there is something waiting for us at the end of the task.

13. Western Academic Policies and Statements

A. 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) or there is flexibility in the submission timeframe (e.g. 72 hour no late penalty period).

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 Examinations dates. These dates as well as other important information about examinations and academic standing can be found [here](#).

B. Academic Offenses

Scholastic offences are taken seriously, and students are directed [here](#) to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.

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.

C. 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](#)

D. 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 his/her official university address is attended to in a timely manner. You can read about the privacy and security of the UWO email accounts [here](#).

E. Discovery Credit Statement

Students are permitted to designate up to 1.0 Discovery Credit course (or equivalent) for pass/fail grading that can be counted toward the overall course credits required for their degree program. The details of this policy and the deadlines can be found [here](#).

F. Turnitin and other similarity review software

All assignments will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. Students will be able to view their results before the final submission. 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](#).

G. 15% Rule

According to the [Evaluation of Academic Performance](#) policy, at least three days prior to the deadline for withdrawal from a 1000- or 2000-level course without academic penalty, students will receive assessment of work accounting for at least 15% of their final grade. Generally, students can expect some form of feedback on their performance in a course before the drop date. In rare instances, at the Dean's discretion, an exemption can be issued, which also must be noted in the course syllabus. Deans should review exemptions on a course-by-course basis each time an exempted course is offered.

14. BMSUE Academic Policies and Statements

Cell Phone and Electronic Device Policy (for in-person tests and exams)

The Schulich School of Medicine & Dentistry is committed to ensuring that testing and evaluation are undertaken fairly across all our departments and programs. For all tests and exams, it is the policy of the School that any electronic devices, e.g., cell phones, tablets, cameras, smart glasses, smart watch or iPod are strictly prohibited. These devices **MUST** be left either at home or with the student's bag/jacket at the front of the room and **MUST NOT** be at the test/exam desk or in the individual's pocket. Any student found with one of these prohibited devices will receive a grade of zero on the test or exam. Non-programmable calculators are only allowed when indicated by the instructor. The program is not responsible for stolen/lost or broken devices.

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. You must always ask permission to record another individual and you should never share or distribute recordings.

Rounding of Marks Statement

Across the Basic Medical Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. **Final grades** on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.45 becomes 74, and 74.50 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g., a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark “bumping” will be denied.

Statement on the use of Generative Artificial Intelligence (AI) Platforms

Within this course, students are permitted to use AI tools for information gathering and preliminary research purposes. These tools can enhance learning experience by providing access to diverse information sources. However, it is essential that students critically evaluate the obtained information, exercise independent thinking, and engage in original research to synthesize and develop their own ideas, arguments, and perspectives. The use of AI tools can serve as a starting point for exploration, with students expected to uphold academic integrity by appropriately attributing all sources and avoiding plagiarism. In other words, AI tools are tools, and students who use the tool are intellectually and ethically responsible for what they will generate with or without tools.

15. Support Services

- Students who are in emotional/mental distress should refer to Mental Health @Western Health <https://www.uwo.ca/health/> for a complete list of options about how to obtain help.
- To connect with a case manager or set up an appointment, please contact support@uwo.ca.
- Other important links:
 - [Academic Advising \(Science and Basic Medical Sciences\)](#)
 - [Appeal Procedures](#)
 - [Registrarial Services](#)
 - [Student Development Services](#)
 - [Student Health Services](#)

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.