

Department of Physiology and Pharmacology
Cellular Physiology-Physiology 3140A

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
Donglin Bai	Discussion forum or donglin.bai@schulich.uwo.ca

Instructor(s) or Teaching Assistant(s)	Contact Information
Dr. John Di Guglielmo	Discussion forum
Dr. Peter Chidiac	Discussion forum
Dr. Chris Pin	Discussion forum
Robert Wong (TA)	Discussion forum
Sahar Mouawad (TA)	Discussion forum
Saiswaran Manoathan (TA)	Discussion forum
Sarah DP Wilhelm (TA)	Discussion forum

4. Course Description and Design

Delivery Mode: In Person

Physiology 3140A is a half-course to introduce students to the basic concepts of cellular and molecular physiology and some of the molecular tools used in the field. It is a survey of principles of cellular physiology including membrane, ion channel, receptor, and transport protein function, and signal transduction mechanisms.

The course consists of 5 sections:

- a) Cell architecture and membrane transport
- b) Cellular electrophysiology including ion channels, membrane potential, and action potential
- c) G-protein coupled receptors and enzyme-linked receptors
- d) Cellular signaling
- e) The nucleus and gene regulation

Perturbations to the intracellular and extracellular environments of the cell will be selected to illustrate physiological responses to stimuli.

In addition, there are five online modules presenting an overview of 5 techniques that are commonly used in scientific research. These should be completed by students by the recommended dates. Material presented in the online modules will assist students with understanding lecture content and are tested in quizzes (in class quiz 1 and 2 details see schedule below), the midterm, and the final exams of the course.

Each instructor will post their lecture slides. The course materials are from multiple sources, including textbooks and scientific literature. There are no required textbooks for the course. The figures used by each lecturer will be referenced in the slides.

Prerequisite(s): one of [Physics 1201A/B](#), [Physics 1501A/B](#), the former [Physics 1028A/B](#), the former [Physics 1301A/B](#); 1.0 course from: [Calculus 1000A/B](#) or [Calculus 1500A/B](#), [Calculus 1301A/B](#) or [Calculus 1501A/B](#), [Data Science 1000A/B](#), [Mathematics 1600A/B](#), [Mathematics 1225A/B](#), [Mathematics 1228A/B](#), [Mathematics 1229A/B](#), [Statistical Sciences 1024A/B](#), [Applied Mathematics 1201A/B](#), [Numerical and Mathematical Methods 1412A/B](#), [Numerical and Mathematical Methods 1414A/B](#), the former [Applied Mathematics 1412A/B](#), the former [Applied Mathematics 1413](#), the former [Applied Mathematics 1414A/B](#); one of [Biology 1001A](#) or [Biology 1201A](#) and one of [Biology 1002B](#) or [Biology 1202B](#); or permission of the department. [Integrated Science 1001X](#) can be used as a prerequisite in place of [Biology 1002B](#) and [Calculus 1301A/B](#). It is strongly recommended that [Biochemistry 2280A](#) and [Biology 2382A/B](#) be taken prior to [Physiology 3140A](#). Open only to students who are registered in Years 3 or 4.

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	M/W/F	9:30 – 10:20 AM

- Attendance at sessions is required
- Missed work should be completed within 24 hours
- Audio recording will be provided if recordings were possible and successful
- Closed captioning will be provided on audio or video recordings

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.

5. Learning Outcomes

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

- 1) Examine the basic principles involved in cellular physiology, including, cell matrices, transporters, ion channels, G-protein coupled receptors, intracellular signalling pathways, gene transcription and regulations.
- 2) Explain intercellular and intracellular communication of biological information.
- 3) Identify and describe experimental approaches and techniques used to study cellular communication.

6. Course Content and Schedule

Dates	Day	Wk	Topic	Instructor	Slides & recording	Lec
Sept 6	F	1	Course Introduction	DB	ppt pdf AV	1
				JD	ppt pdf AV	
Sept 9	M	2	Integrating Cells into Tissues	JD	ppt pdf AV	2
Sept 11	W		Cell-Matrix Interactions	JD	ppt pdf AV	3
Sept 13	F		Cell-Matrix Interactions II	JD	ppt pdf AV	4
Sept 16	M	3	Cell-Cell Interactions	JD	ppt pdf AV	5
Sept 18	W		Epithelial Cell Polarity/Properties	JD	ppt pdf AV	6
Sept 20	F		Transport Across Epithelium	JD	ppt pdf AV	7
Sept 23	M	4	Cytoskeleton/Scaffolding Proteins	JD	ppt pdf AV	8
Sept 25	W		Membrane Properties/ Lipid Bilayer	JD	ppt pdf AV	9
Sept 27	F		Membrane Rafts/ Signaling Platforms	JD	ppt pdf AV	10
Sept 30	M	5	<i>Truth and Reconciliation Day – no lecture</i>			
Oct 2	W		In Class Quiz 1	JD, DB		
Oct 4	F		Ion Channels	DB	ppt pdf AV	11
Oct 7	M	6	Molecular Structure of Ion Channels	DB	ppt pdf AV	12
Oct 9	W		Patch Clamp	DB	ppt pdf AV	13
Oct 11	F		Nernst Equation and Resting Membrane Potentials	DB	ppt pdf AV	14
Oct 12 - 20		7	<i>Fall Reading Week – no lecture</i>			
Oct 21	M	8	Action Potentials	DB	ppt pdf AV	15
Oct 23	W		Review	DB	ppt pdf AV	16
Oct 25	F		Cell Signaling Introduction	PC	ppt pdf AV	17
Oct 28	M	9	Receptor Signaling classes	PC	ppt pdf AV	18
Oct 30	W		From membrane to nucleus I – WNT/ β -catenin	CP	ppt pdf AV	19
Nov 1	F		From membrane to nucleus II - TGF β /SMADs	CP	ppt pdf AV	20

Nov 4	M	10	Enzyme linked receptors	JD	ppt pdf AV	21
Nov 6	W		In Class Quiz 2	PC, DB	ppt pdf AV	
Nov 8	F		GPCR I	PC	ppt pdf AV	22
Nov 11	M	11	GPCR II	PC	ppt pdf AV	23
Nov 13	W		G protein mediated signaling I	PC	ppt pdf AV	24
Nov 15	F		G protein mediated signaling II	PC	ppt pdf AV	25
Nov 18	M	12	Nuclear organization and structure	CP	ppt pdf AV	26
Nov 20	W		Transcription I Genes, promoters & enhancers	CP	ppt pdf AV	27
Nov 22	F		Transcription II – Transcription factors	CP	ppt pdf AV	28
Nov 25	M	13	Transcription III – Nuclear receptors	CP	ppt pdf AV	29
Nov 27	W		Epigenetics I – Histone modifications	CP	ppt pdf AV	30
Nov 29	F		Epigenetics II – DNA methylation	CP	ppt pdf AV	31
Dec 2	M	14	Epigenetics III – non-coding RNAs	CP	ppt pdf AV	32
Dec 4	W		DNA damage and repair I	CP	ppt pdf AV	33
Dec 6	F		DNA damage and repair II	CP	ppt pdf AV	34
Dec 9-22			Final exam TBD			

7. Participation and Engagement

- Students are expected to participate and engage with content as much as possible
- Students can participate during class sessions
- Students can also participate by interacting in the discussion forums with their peers, TAs, and instructors

8. Assessment and Evaluation

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

Assessment	Format	Weighting	Date	Flexibility
In Class Quiz 1, covers Module 1-2	Mixed format (25 min)	7%	Oct 2 in class	Not applicable
Midterm Test (2 hrs), covers lecture 1 – 16, module 1-2	Mixed format (2 hrs)	40%	Sunday, Oct 27	Not applicable
In Class Quiz 2, covers Modules 1-5	Mixed format (25 min)	8%	Nov 6 in class	Not applicable
Final Exam, covers lecture 17 – 34, module 1-5	Mixed format (2.5 hrs)	45%	December exam period	Not applicable

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 Midterm Test has been designated as requiring supporting documentation.**

Information about flexibility in assessment

- Missing quiz 1 with academic consideration, the weight will be shifted to Midterm test. Missing quiz 2 with academic consideration, the weight will be shifted to the Final exam.

General information about assessments

- Quiz 1 covers the materials in online module 1 and 2. Quiz 2 covers the materials in online module 1 – 5. Module 1-2 or module 1-5 are testable in the midterm or final exam, respectively.

- Both quizzes are “closed book” conducted in class time with a duration of 25 minutes each (see schedule for the date of each quiz).
- 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 quizzes or exams must be received within 3 weeks of the grade being posted.

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:

- Midterm Test: One make up midterm test will be offered to eligible students (for e.g., students who missed the original exam due to illness). The make-up exam date will be set by the department usually a few days after the exam.
- Final Exam: One make up final exam will be offered to eligible students during the make-up exam date set by the department.
- Both midterm and final exams must be completed to pass the course. If any of these is missed, an INC will be assigned and students would write the missed midterm / final exam the next time that the 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.

9. Communication

- Students should check the OWL Brightspace site every 24–48 hours
- 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

10. Office Hours

- Office hours will be held in-person or remotely using Zoom
- Office hours will be booked / drop-in, depending on the instructor
- Office hours will be individual and/or group depending on the instructor

11. Resources

- All resources will be posted in OWL Brightspace

12. 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
- Students will be expected to take an academic integrity pledge before some assessments

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).

13. 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).
7. Reward yourself for successes. It seems easier to motivate ourselves knowing that there is something waiting for us at the end of the task.

14. 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](#).

15. 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

This is not applicable for any of the assessments in this course. Students are permitted to use AI tools exclusively for information gathering and preliminary research purposes. These tools are intended to enhance the learning experience by providing access to diverse information sources.

16. 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.