

General Course, Instructor & TA Information

If you are contacting your instructor or TA, please use your Western email address.

Teaching Assistant:**Land Acknowledgement.**

We/I acknowledge that Western University is located on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Chonnonton Nations, on lands connected with the London Township and Sombra Treaties of 1796 and the Dish with One Spoon Covenant Wampum. With this, we/I respect the longstanding relationships that Indigenous Nations have to this land, as they are the original caretakers. We acknowledge historical and ongoing injustices that Indigenous Peoples (First Nations, Métis and Inuit) endure in Canada, and we accept responsibility as a public institution to contribute toward revealing and correcting miseducation as well as renewing respectful relationships with Indigenous communities through our teaching, research and community service.

Learn more about Indigenous Initiatives at Western: <https://indigenous.uwo.ca/>

Equity, Diversity, and Inclusivity Statement

We will uphold an equitable and inclusive learning environment for all students in this course and we welcome students from all backgrounds, ethnicities, sexual orientations, and genders. This course is a safe learning environment, where any form of discrimination will not be tolerated under any circumstances.

Note: This class is LIVE only! But there is a contingency plan for in-person class pivoting to 100% online learning.

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, affected course content will be delivered entirely online synchronously (i.e., at the times indicated in the timetable). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

Note: Remote Proctoring Software may be used in this course, in the event of health lock-down. Tests and examinations in this course will 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>

The website for the **Office of the Registrar** is <http://www.registrar.uwo.ca>.

In accordance with policy, 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.

Prerequisites:

Entrance into Biology 4338G requires a mark of 75% or better in Biology 3338A. "Unless you have either the requisites for this course or written special permission from your Dean's Designate (Department/Program or Science Academic Advisors) 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 if you are dropped from a course for failing to have the necessary prerequisites.

Senate definition for meaning of letter grades:

- 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

Course Description

An analysis of specific topics in embryology and development of model organisms. The course will focus primarily on genetic and biochemical pathways which have been conserved between distantly related organisms.

Course Outcomes

Following the successful completion of the course students will be able to:

1. Read and interpret primary research articles in the field of developmental biology
2. Participate in meaningful discussions about primary research articles in the field of developmental biology
3. Summarize and identify the key findings of a primary research article in the form of an oral presentation and summary write-up
4. Identify and describe the uses of different model systems and signaling pathways in developmental biology research in the form of an oral presentation and summary write-up

The lectures and tutorials in this course are designed to familiarize students with several model organisms and major signaling pathways currently being used to explore the molecular and genetic basis of development. The unique features, advantages and disadvantages will be discussed by analyzing primary research in the developmental biology field.

Lecture Topics:

These may change depending on the interest of the subject material. For some lectures, I might present an overview on the Wednesday lecture & then assign readings. We will discuss the papers in class on the following Monday, so come prepared to answer questions.

****ALL lectures and lab presentations in this course are mandatory****

Model Systems	Signaling Networks in Development
Historical Perspectives of Developmental Biology	Stem Cell Biology
Organ Development	Gastrulation
Gene Regulatory Networks	Cell Fate Determination

Course Website:

Students should check OWL (<https://westernu.brightspace.com>) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

If students need assistance with the course OWL site, they can seek support on the OWL Brightspace Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Labs/**Presentations** begin in February 2026. Your lab partners will be assigned by this time. Attendance is mandatory for all labs/ **presentations**. Student presentations will be announced as soon as we know what model systems are available, and the course enrollment.

Evaluation:

Electronic devices are NOT allowed during the midterm or final examinations. Phones, tablets, must be off or switched to Airplane mode during exams. You can use your computer for the exams but you must ONLY have the paper in question on it. Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at this website: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Lecture midterm 20%. If applicable, you can **get accommodation** for this, but there is NO makeup for this midterm and the marks will be added to the Final 20+30%. **Note, this exam is worth 50%, and will not have the material for the midterm.**

Class presentation 15%. An Essential Requirement of this course.

Lab presentation 15%. An Essential Requirement of this course.

Lab write-ups - 2 “News and Views” written assignments, **each worth 7.5%**. All students are granted a 2-day grace-period to submit both articles, but after 2-days 0 marks are given.

Both write-ups constitute **Essential Requirements of this course.**

Class Participation 5%. This will be based on lecture/lab attendance and participation.

Final 30% (*50%). An Essential Requirement of this course, scheduled by the Registrar.

For those missing the 20% from the midterm and with Accommodation.

The midterm will be written in the lab section on Feb. 12th and is worth 20 percent of the course. The Final of the course, scheduled by the Registrar, but this (30%) and the other final (20+30%=50%) will NOT have material from the midterm. **These exams are an Essential Requirement of this course.** In the event of missing these exams and with **the approval from the Academic Advising Office of your home faculty of your request for Academic Consideration made through the student absence portal (see https://registrar.uwo.ca/academics/academic_considerations/),** there will be a make-up exam coordinated in the exam period for the Department.

Methods of Evaluation:

Midterm

The midterm exam will be held in lab Thursday Feb. 12th, 2026 from 2:30-4:00pm. The exam will be 1.5 hours in length. Exams are open book so memorization will not help you prepare for the exams in this course as they rely on your ability to think critically and to express your opinion in a professional and constructive manner. You can NOT use electronic devices and no other website(s) is allowed during the exam.

This midterm exam will be worth 20% of the final grade. There is no makeup for the midterm exam.

Final Exam

The final exam will be held during the April exam period as scheduled by the Registrar. The exam will be 2 hours in length. Exams are open book so memorization will not help you prepare for the exams in this course as they rely on one's ability to think critically and to express your opinion in a professional and constructive manner.

The Final Exam will be worth 30% of the grade and the other exam is worth 50% (20% plus 30%) of the final grade; the extra 20% coming from the missed midterm exam (**Accommodated Exams**).

Presentations

Class Presentation – Developmental Pathways

Students (depending on course size) will be assigned a developmental signaling pathway where students are required to summarize and interpret the relevant background, main research question, methods, key findings and conclusions of a primary research article. The chosen research article **MUST** be from **within the last 5 years**, **MUST** be relevant to developmental biology and **MUST** discuss the assigned pathway.

Presentations will be held during class time on **Mondays and Wednesdays from 12:30-1:20pm**. Presentations (depending on course size) must be **20 mins and will be followed by 5 mins of questions** from the audience. Students will be assigned their presentation date. This is an essential requirement of the course; self-reporting (undocumented absence) is **NOT** allowed. This assessment will be worth 15% of the final grade.

Lab Presentations - Model Organisms

Students (depending on course size) will be assigned a model organism used in developmental biology research where students are required to discuss a brief history of the organism and its use in the field, the advantages and disadvantages of using the organism, and summarize, interpret, and present the relevant background, main research question, methods, key findings and conclusions of a primary research article. The chosen research article **MUST** be from **within the last 5 years**, **MUST** be relevant to developmental biology, and **MUST** be using the assigned model organism.

Presentations (TBA) will be held during tutorial sessions on **Thursdays from 2:30-5:00pm**. Presentations (depending on course size) must be **30 mins and will be followed by 5mins of questions** from the audience. Students will be assigned their presentation date and partner. This is an essential requirement of the course AND will be worth 15% of the final grade.

“News & Views” Write-up Guidelines

The first “News and Views” style write up will summarize the SAME primary research article chosen for the Class Presentation and the second write-up will summarize the SAME primary research article chosen for the Lab Presentation. These assessments should summarize the relevant background, main research question, key findings, and conclusions of the article. In addition, the write up should address how the field stood before the findings proposed in the chosen research article, discuss how the research fits into the greater field of study and how it has or could change the future of research in the field.

Both write-ups must be written according to the following:

- Written in English
- Minimum of 1250 words and a maximum of 1350 words
- Arial font, size 12, 1.5 pt spacing
- Maximum of 15 references

As these write-ups are styled after the Nature News & Views section, use the following information to help in the scope and level of the write-up:

These articles inform non-specialist readers about new scientific advances

- Articles should be within the length limits given by the News & Views editor (1250-1350 words)
- Titles should contain no punctuation marks or abbreviations. News & Views articles also carry a ‘strapline’ of one or two words to define the general subject area of the article, and a sentence to summarize the message of the article in simple language
- The ‘news’ should be mentioned in a succinct opening paragraph to attract the attention of those who are not experts in the field. This paragraph should explicitly refer to the paper under discussion and touch on the significance of the new work
- More detail, background and explanation should follow, including the author’s own views. The text is often best rounded off with comment on the implications of the new work and on future research directions
- Articles should not read like textbooks: most readers will have a general scientific background, but specialized terminology should be avoided
- Diagrams (or figures – 3 maximum) should be used to explain the new points made, or the background science to the new result
- References should be kept to a minimum, ideally fewer than 15. They should be given superscript numbers and cited sequentially in the text, per *Nature* style. References should be listed at the end of the article in the usual *Nature* style but without the titles of citations

News & Views 1 – **Due.**

News & Views 2 – **Due.**

Each assessment will be worth 7.5% of the final grade.

****Essay Courses:**

The guidelines for the minimum written assignments refer to the cumulative amount of written work in a course but excludes written work in examinations. An essay course must normally involve total written assignments (essays or other appropriate prose composition, excluding examinations) as follows:

Half course (2000 and above): at least 2500 words and must be so structured that the student is required to demonstrate competence in essay writing to pass the course.

The structure of the essay course must be such that in order to pass the course, the student must exhibit some minimal level of competence in essay writing and the appropriate level of knowledge of the content of the course.

The term "essay" is to be understood broadly to include many of the reports, reviews, summaries, critiques, and some laboratory reports that are currently assigned, as well as essays in the strictest sense. The essential point is that the assignments involve assembling information and argument and presenting it in connected prose.

Student Absences

General information about missed coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs* posted on the Academic Calendar: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf,

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage:

https://registrar.uwo.ca/academics/academic_considerations/

All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must normally include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course. However, the following assessments are excluded from this, and therefore always require formal supporting documentation:

- **The final exam, held during the Exam Period**

- **Tutorial presentation** (Designated by the instructor as the one assessment that always requires documentation when requesting Academic Consideration). In the event that you miss your tutorial presentation date with approved Academic Consideration, you will be rescheduled to present at the next available date.

When a student mistakenly submits their one allowed Academic Consideration request **without supporting documentation** for the assessments listed above or those in the **Coursework with Assessment Flexibility** section below, the request cannot be recalled and reapplied. This privilege is forfeited.

Scheduled office hours and/or the **OWL Forum** (<https://westernu.brightspace.com>) **are the primary ways to ask questions regarding lecture material**; TAs will be monitoring the Forum regularly, and it is encouraged that other students address questions from their peers.

Absences from Final Examinations

When a student misses the Final Exam and their Academic Consideration has been granted, they will be allowed to write the Special Examination (the name given by the University to a makeup Final Exam written though a Special Examination offered by the Department). See the Academic Calendar for details (under Special Examinations), especially for those who miss multiple final exams within one examination period.

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (e.g., more than 2 exams in a 23-hour period, more than 3 exams in a 47-hour period).

Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/advising/>

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

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

To connect with a case manager or set up an appointment, please contact support@uwo.ca

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education if you have any questions regarding accommodations.

https://academicsupport.uwo.ca/accessible_education/index.html

Learning-skills counsellors at the Student Development Centre (<https://learning.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time

management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>

Additional student-run support services are offered by the USC: <https://westernusc.ca/services/>

Emailing Policy

Students are encouraged to use the OWL Forum as their primary way of asking questions related to lecture material.

When students are emailing, they must use their UWO email and have Bio4338 followed by the nature of the email in the subject line. When emailing after regular working hours allow 24 hours before expecting a response. Emails sent on a weekend will be answered 24 hours after the next business day. **Any email received where the question can be answered by reading the course outline will not be returned!** Likewise, no emails or forum posts will be addressed 24 hours before the midterm and final exam.

Inappropriate language on the Forum or in emails will not be tolerated under any circumstances and will be reported.

Religious Accommodation

When conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible but not later than two weeks prior to the writing of the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university's EDID website for the recognized religious holidays:

<https://www.edi.uwo.ca>.

Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities can be found at: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf

Support Services: Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and other academic-related matters: <https://www.uwo.ca/sci/counselling/>. Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

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if you have any questions regarding accommodations.

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How to Succeed in this Course

This course is not meant to evaluate your ability to memorize, but your ability to think critically and analyze the results in primary research. Coming prepared to participate in meaningful discussion for every single class will be the best to learn these critical thinking skills. When preparing for class, simply reading the assigned primary research articles is often not sufficient, make sure to take notes, look up definitions of terms or mechanisms of actions or chemicals or genes/mRNA/proteins used, and making sure you understand the techniques. If you do not understand any parts of the paper, be prepared to ask other members of the class including Dr. Kelly or the TAs during class time, in the OWL Forum or during scheduled office hours.

This syllabus will be posted on the OWL-Brightspace website assigned to the course.