

## **Biology 4338G: Advanced Developmental Biology 2023-2024**

### **General Course, Instructor & TA Information**

**Professor G.M. Kelly, 359 WSC, [gkelly@uwo.ca](mailto:gkelly@uwo.ca)**

Office Location: TBA

Email: [gkelly@uwo.ca](mailto:gkelly@uwo.ca)

Lecture: TBA

Labs: TBA

Office Hours: Mon and Wed 1:30-2:30 pm, or by alternate arrangements. If you are contacting your instructor or TA, please use your Western email address.

### **Teaching Assistants:**

**Nuwanthika Gedara**

Email: [nwathuli@uwo.ca](mailto:nwathuli@uwo.ca) Office Location: TBA

### **Land Acknowledgement.**

We/I acknowledge that Western University is located on the traditional territories 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. This land continues to be home to diverse Indigenous Peoples (First Nations, Métis and Inuit) whom we recognize as contemporary stewards of the land and vital contributors of our society.

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 an 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, including 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 Registrarial Services 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 Associate 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 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 one lecture & then assign readings. We will discuss the papers in class on the following Monday, so come prepared to answer questions.

**\*\*ALL lectures and labs 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://owl.uwo.ca/portal>) 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.

Labs/**Presentations** are to be in 2024 (TBA). 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. You will need safety glasses and lab coat (for wet labs).

### Evaluation:

Lecture midterm 20%. If applicable, you can **get accommodation** for this, but you will be required to take a makeup at a later date.

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 in lecture participation.

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

The midterm TBA. Make-up exams will be scheduled as early as possible following the missed midterm and will take on a different form from the first midterm. There will only be one make-up for the midterm and in the event of missing this makeup and with **the approval from the Academic Counselling Office of your home faculty**, the weight will be transferred onto your final exam (20% + 30%).

### Methods of Evaluation:

#### Midterm

The midterm exam TBA. 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

Commented [NG1]: Greg, Can we assign some marks for the participation to the class discussion?

to think critically and to express your opinion in a professional and constructive manner. No electronic devices are allowed during the exam.

The midterm exam will be worth 20% of the final grade.

### **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 final grade.

### **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, method, 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 TBA. Presentations (depending on course size) must be **15 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 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, method, 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 (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 and partner. This is an essential requirement of the course.

This assessment 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 TBA by the TA.**

News & Views 2 – **Due TBA by the TA.**

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**

**Note:** Being asked not to attend an in-person course requirement due to potential COVID-19 symptoms is **not** sufficient on its own.

If you are unable to meet a course requirement due to illness or other circumstances dictated by UWO policy, and if you are a Science student, the Academic Counselling Office of the Faculty of Science can be contacted at:

[https://www.uwo.ca/sci/counselling/advising\\_services/counselling\\_hours.html](https://www.uwo.ca/sci/counselling/advising_services/counselling_hours.html). Note that approval of accommodation for any course component worth 10% or more can only be made by the student's Dean's Office/Academic Counselling unit.

### **Assessments worth 10% or more of the overall course grade:**

By policy, academic considerations for work totaling 10% or more of the final course grade can be granted only by the student's Faculty of Registration (typically by their academic counsellors). For work totaling 10% or more of the final course grade, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible.

For further information, please consult the University's medical illness policy at:

**[//www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_medical.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf)**

The Student Medical Certificate is available at:

**[//www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf)**

### **Absences from Final Examinations**

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you can. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

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 23-hour period, more than 3 exams in a 47-hour period).

### **Academic Consideration by Instructor for work worth less than 10% of the overall grade in a course**

Instructors are encouraged, in the first instance, to arrange participation requirements and multiple small assignments in such a way as to allow students some flexibility.

A student seeking academic consideration for any work worth less than 10% must contact the instructor or follow the appropriate Department or course specific instructions provided on the course outline.

In arranging academic consideration, instructors will use good judgment and ensure fair treatment for all students. Instructors must indicate on the course outline how they will be dealing with work worth less than 10% of the total course grade. In particular, instructors must indicate whether medical documentation will be required for absences, late assignments or essays, missed tests, laboratory experiments or tutorials, etc. Where medical documentation is required, such documentation must be submitted by the student directly to the appropriate Faculty Dean's office, and it will be the Dean's office that will make the determination whether academic consideration is warranted. Given the University's [Official Student Record Information Privacy Policy](#), instructors may not collect medical documentation.

In all cases where academic consideration is being sought for work totalling 10% or more of the final grade in a course, students will be directed to the appropriate Faculty Dean's office.

Students who have been denied academic consideration by an instructor may appeal this decision to the appropriate Faculty Dean's office but will be required to present appropriate documentation.

A student may appeal a decision on academic consideration made by the Dean's Office of the student's Home Faculty to the Senate Review Board Academic (SRBA) as set out in the [Undergraduate Student Academic Appeals](#) policy.

Please visit the Science & Basic Medical Sciences Academic Counselling 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/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.

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).

To connect with a case manager or set up an appointment, please contact [support@uwo.ca](mailto: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.

[http://academicsupport.uwo.ca/accessible\\_education/index.html](http://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/>

This course is supported by the Science Student Donation Fund. If you are a BSc or BMSc student registered in the Faculty of Science or Schulich School of Medicine and Dentistry, you pay the Science Student Donation Fee. This fee contributes to the Science Student Donation Fund, which is administered by the Science Students' Council (SSC). One or more grants from the Fund have allowed for the purchase of equipment integral to teaching this course. You may opt out of the Fee by the end of September of each academic year by completing the online form linked from the Faculty of Science's Academic Counselling site. For further information on the process of awarding grants from the Fund or how these grants have benefitted undergraduate education in this course, consult the Chair of the Department or email the Science Students' Council at [ssc@uwo.ca](mailto:ssc@uwo.ca).

### **Emailing Policy**

Students are encouraged to use the OWL Forum as their primary way of asking questions related to lecture material. Please use this forum before emailing Dr. Kelly or the TA a lecture related question.

When students are emailing either Dr. Kelly or the TA, 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.

### **Accommodation and Accessibility**

#### **Religious Accommodation**



When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

### **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 policy on Academic Accommodation for Students with Disabilities is as follows:

### **Support Services**

The University recognizes that a student's ability to meet their academic responsibilities may, on occasion, be impaired by medical illness. Illness may be acute (short term), or it may be chronic (long term), or chronic with acute episodes. Academic Consideration provides students with consistent, fair, and pedagogically appropriate consideration, without compromising the academic integrity of the course or program, when they have been unable to complete some component of a course due to short-term extenuating circumstances. Students who have long-term or chronic medical conditions (physical or mental) that may impede their ability to complete academic responsibilities are directed to seek Academic Accommodation through Accessible Education ([Academic Accommodation for Students with Disabilities](#)).

### **Policy for Academic Consideration for Medical Illness – Undergraduate Students**

The University further recognizes that medical situations are deeply personal and respects the need for privacy and confidentiality in these matters. However, in order to ensure fairness and consistency for all students, academic consideration for work representing 10% or more of the student's overall grade in the course shall be granted only in those cases where there is documentation indicating that the student was seriously affected by illness and could not reasonably be expected to meet their academic responsibilities.

Documentation shall be submitted, as soon as possible and no later than 48 hours after the end of the period of absence covered, to the Academic Counselling unit or Dean's Office of the student's Home Faculty together with a request for relief specifying the nature of the academic consideration being requested. These documents will be retained in the student's file and will be held in confidence in accordance with the University's [Official Student Record Information Privacy Policy](#). Once the petition and supporting documents have been received and assessed, appropriate academic consideration shall be determined by the Dean's Office in consultation with the student's instructor(s). Academic consideration may include extension of deadlines, waiver of attendance requirements for classes/labs/tutorials, arranging Special Exams or Incompletes, re-weighting course requirements, or granting late withdrawals without academic penalty. Academic consideration shall be granted only where the documentation indicates that the onset, duration and severity of the illness are such that the student could not reasonably be

expected to complete their academic responsibilities. (Note – it will not be sufficient to provide documentation indicating simply that the student “was seen for a medical reason” or “was ill.”)

Whenever possible, students who require academic consideration should provide notification and documentation in advance of due dates, examinations, etc. Students must follow up with their professors and their Academic Counselling office in a timely manner.

#### **Documentation from Family Physicians/Nurse Practitioners and Walk-In Clinics**

A Western Student Medical Certificate (SMC) is required where a student is seeking academic consideration. This documentation should be obtained at the time of the initial consultation with the physician/nurse practitioner or walk-in clinic. An SMC can be downloaded at [http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf).

#### **Documentation from Student Health Services**

At the time of illness, students should make an appointment with a physician/nurse practitioner at Student Health Services. During this appointment, request a Student Medical Certificate from the Physician/Nurse Practitioner.

#### **Policy for Academic Consideration for Medical Illness – Undergraduate Students**

#### **Documentation from Hospital Urgent Care Centres or Emergency Departments**

Students should request that an SMC be filled out. Students may bring this form with them or request alternative Emergency Department documentation. Documentation should be secured at the time of the initial visit to the Emergency Department. Where it is not possible for a student to have an SMC completed by the attending physician, the student must request documentation sufficient to demonstrate that their ability to meet their academic responsibilities was seriously affected.

#### **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 website assigned to the course.**