

Biology 4338G: Advanced Developmental Biology **2021-2022**

General Course, Instructor & TA Information

Professor G.M. Kelly, 359 WSC, gkelly@uwo.ca

Office Location: Western Science Centre, Room 359, 519-661-3121

Email: gkelly@uwo.ca

Lecture: Monday and Wednesday, 12:30-1:20, On Zoom and AHB-2B02 in-person

Labs: Thursday, 2:30-5:30, B&GS-3015

Office Hours: Mon and Wed 1:30-12:30 pm, or by alternate arrangements. If you are contacting your instructor or TA, please use your Western email address.

Teaching Assistants:

Danielle Spice Email: dspice@uwo.ca Office Location: WSC 355

Nuwanthika Gedara Email: nwathuli@uwo.ca Office Location: WSC 355

Land Acknowledgement.

We/I acknowledge that Western University is located on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron peoples, 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 and ONLINE until Western administration says otherwise!

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 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 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 currently being used to explore the molecular and genetic basis of development. The unique features, advantages and disadvantages of each organism 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 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:

Labs begin in February 2022 (dependent on when the sea urchins begin breeding). Your lab partners will be assigned by this time. Attendance is mandatory for all labs. 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 **self-report** for this, but you will be required to take a makeup ~~at a later date~~ later.

Class presentation 15%. **An Essential Requirement of this course, self-reporting is not allowed.**

Lab presentation 15%. **An Essential Requirement of this course, self-reporting is not allowed.**

Lab write-ups - 2 “News and Views” written assignments, each worth ~~7.5~~ 7.5%. All students are granted a 2-day grace-period to submit both articles, no self-reporting is required.

Final 35% **An Essential Requirement of this course, self-reporting is not allowed.**

The midterm will be written in the lab section on Feb. 17th, 2022 (in lab or on Gradescope as needed). 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.

@More information on self-reporting can be found on the course (OWL) website.

Methods of Evaluation:

Midterm

The midterm exam will be held in lab Thursday Feb. 17 from 2:30-5:30pm. 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 one’s ability 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 ~~35~~ 50% of the final grade.

Presentations

Class Presentation – Developmental Pathways

Students will be assigned, in partners, a developmental signaling pathway where students are required to summarize and interpret the relevant background, main research question, 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 12:30-1:30pm**. Presentations 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 will be assigned, in partners, 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, 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 will be held during lab sessions on **Thursdays from 2:30-5:30pm**. Presentations 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; self-reporting is NOT allowed.

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 Monday Feb. 28 at 5pm**

News & Views 2 – **due Friday Apr. 1 at 5pm**

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.

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 TAs a lecture related question.

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

If you are unable to meet a course requirement due to illness or other circumstance dictated by UWO policy, you can **self-report** (2 times per student per academic year) or if you have previously **self-reported** twice **you must** instead provide valid medical or supporting documentation to the Academic Counselling Office of your home faculty as soon as possible. If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in WSC 140 and can be contacted at

https://www.uwo.ca/sci/counselling/advising_services/counselling_hours.html

For further information, please consult the university's medical illness policy at http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

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 outside of self-reporting.

If you miss the Final Exam, please contact your faculty's Academic Counselling Office as soon as you can. They will assess your eligibility to write the Special Exam (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" (https://registrar.uwo.ca/academics/examinations/exam_conflicts.html).

Academic Policies:

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.

Phones, tablets, or laptops must be off or switched to "Airplane" mode during exams.

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

Support Services:

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 Student Accessibility Services at 661-2111 ext. 82147 if you have questions regarding accommodation.

The policy on Accommodation for Students with Disabilities can be found here:

<http://sdc.uwo.ca/ssd/>

The policy on Accommodation for Religious Holidays can be found here:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.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.

Students who are in emotional/mental distress should refer to the Wellness Education Centre (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://academicsupport.uwo.ca>

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 proteins used, and making sure you understand the techniques used. If you do not understand any parts of the paper be prepared to ask Dr. Kelly or the TAs during class time or in the OWL Forum.

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