Western Science

Department of Biology

Bio3338a Developmental Biology 2025 Syllabus

General Course Information

Instructor: Dr. Sashko Damjanovski **Email: sdamjano@uwo.ca**
TAs
Students must use their Western (@uwo.ca) email accounts for course communication.

Prerequisites
Unless you have either the prerequisites 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. The prerequisites for this class are: Biochemistry 2280a; Biology 2581a/b, and Biology 2382a/b

Important Dates

First Bio3338a lecture	Thanksgiving	Reading week	Last 3338a lecture	Exam period
Sept 8	Oct 13	Nov 1-9	Dec 8	Dec 11-22

*Final day to drop course without penalty – Dec 1

Modes of Delivery (as of September 2025)

IN-PERSON	**Lectures**	**Office Hours**	**Midterm**	**Final exam**
	Mon & Wed	Mon & Wed	Oct 15	TBT

IN-PERSON Tutorials	Section 002	Section 003	Section 004	Section 005

ONLINE Quizzes				

Course material (PowerPoint slides, etc) and quizzes will be posted to OWL Brightspace: https://westernu.brightspace.com/d2l/login.
No audio or video recordings of the lectures will be available.

2025 Course Description

Textbook: Barresi and Gilbert, Developmental Biology **13th. Ed.** (recommended).
A reading list from the text will be provided in various lectures.

Lecture Topics (anticipated)

- Introduction: Overview of Development
- Developmental Concepts, Terms, and Tools
- Cytoplasmic Determinants and Positional Information
- Signal Transduction
- Gametogenesis and Fertilization
- Egg Activation and Cleavage Patterns
- Sea Urchin Gastrulation
- Frog Gastrulation
- Chick Gastrulation
- Establishment and Patterning of Body - axes and germ layers
- Neural Induction and Patterning
- Somitogenesis and mesoderm derivatives
- Neural Crest Cells
- Vertebrate Limb Formation

Learning outcomes

Upon successful completion of Bio3338a Developmental Biology, students will be able to:

1) Understand the fundamental principles of embryonic cell fate, commitment, competence, and induction as they relate to the development of multicellular organisms.
2) Recollect fundamental cell signalling cascades (wnt, RTK, TGF-beta, notch etc).
3) Understand the process of species-specific sexual fertilization and explain fundamental mechanisms that prevent polyspermy.
4) Recognize the importance of early cellular cleavage patterns in dividing up asymmetric maternal determinants and how these determinants facilitate future cellular signalling.
5) Relate signalling and inductive interactions and the knowledge of cellular movements that result during embryonic gastrulation and neurulation as result in the formation and patterning of the three germ layers (endoderm, mesoderm, ectoderm), as well as the neural tube.
6) Understand the developmental consequences of alterations to normal gastrulation or neurulation, particularly focusing on limb development and motor neuron function.
7) Apply knowledge of the principles of body axis patterning as they relate to the generation of the axes found in the fore and hind limbs.
8) Read primary scientific papers in the field of developmental biology at sufficient depth to be able to critically assess and synthesize information.

Participation and Engagement - Students are expected to engage with content as much as possible. Ask questions! Students are required to attend and participate during tutorial sessions.

Technical Requirements

As this course **involves remote elements** it **REQUIRES** a computer with a stable internet connection. Should accommodations necessitate, a working microphone and webcam, and the capability to run Zoom software may also be needed. If students need assistance, they can seek support on the OWL Help page, contact the Western Technology Services Helpdesk, phone at 519-661-3800 or ext. 83800. Google Chrome or Mozilla Firefox are the preferred OWL browsers.

Methods of Evaluation

Material from tutorials will NOT be tested on Quizzes. Midterm, or Exam.

Lecture material will be evaluated via 4 online quizzes, one in person midterm, and a Final Exam.

Quiz 1	*(7.5%)*	
Quiz 2 (non-cumulative)	*(7.5%)*	
Quiz 3 (non-cumulative)	*(7.5%)*	
Quiz 4 (non-cumulative)	*(7.5%)*	
Top 3 quizzes counted	**22.5%**	
Midterm (cumulative)	22.5%	
Tutorial presentation	12.5%	
Tutorial feedback	2.5%	
Final exam (cumulative)	40%	- Scheduled by Registrar. 120 min (?) – in person

After an assessment is returned, please wait 24 hours before contacting the evaluator.

QUIZZES

Quizzes will be online (Brightspace/Owl) and everyone will be universally accommodated.

There are 4 online quizzes scheduled. Quizzes are not cumulative and only cover the lecture material taught in the 2 or so weeks prior to it. Quizzes will be mixed format – T/F multiple choice, fill-in-the-blank, label diagrams, one-word answers. Each quiz (likely between 10-15 questions) will be presented in a linear fashion. Once an answer is submitted, there is no going back. Your top 3 quiz grades will be worth 7.5% each. Thus, the quizzes will represent 22.5% of your final grade.

The quizzes are designed to be answered in 20 mins. However, everyone will be maximally accommodated. Depending on student time accommodations, everyone will receive the same length of time (20 mins + accommodations) as the student that is maximally accommodated. Additionally, the quiz will be written within an expanded "time window".

As there is built in flexibility (3 of the 4 quiz grades count) there is no make-up quiz. Should you miss one quiz (or choose not to write one) nothing has to be done. The 3 quizzes you wrote will be used to calculate the 22.5% of your final grade. Should you miss more than one quiz, then you will need to provide an undocumented (maximum of one) or valid **documented** reason through the Student Absence Portal, or similar counselor support, for your missed quizzes. Otherwise, you will forfeit the 7.5% value of each quiz missed beyond one. With documentation the 7.5% value of each missed quiz will be transferred to the final exam.

MIDTERM

There will be one in-person midterm, written in class during lecture time, on --------. The midterm will cover all lecture material from the beginning of term. The midterm will be mixed format but largely fill in the blank, T/F, diagram labels, and very short answers. The midterm is designed to be completed in 30 minutes, with the plan that everyone will be maximally accommodated to the constraints of the lecture time (50 mins).

Should you not be able to write the midterm, you cannot use an undocumented reason for absence. With a **documented** Student Absence Portal submission or similar counselor support there will be a makeup midterm, currently planned for the early morning of ----------.

Should you miss both ----------, (both documented), the value of the midterm will be added to the final exam.

TUTORIALS:

An introductory talk regarding tutorials will be given by Dr. Damjanovski *in class*. The tutorial schedule below will be explained by Dr. Damjanovski, as well as guidelines/hints given as to what is expected. Schedules and resources will also be found within the tutorial link on OWL. The tutorials will be run by your TAs

Tutorials are Mondays (002 and 004) and Wednesdays (003 and 005) at -------, each in a designated room. The tutorial group schedule below, and the individual group presentation dates once established, will also be posted on OWL. Over the course of the term you will deliver one presentation during one tutorial (12.5%), as well as attend a total of 5 in-person tutorials AND fill in 5 feedback forms (2.5%). **Tutorial attendance is mandatory!**

Tutorials will involve groups of 2 students delivering a 12-minute presentation about a research article to their tutorial section (uploaded to the lecture room computer **via USB**). It is expected that each student participates equally, and each speak for about 6 minutes of the 12-minute total time. This will be followed by a 3-minute question period. THREE group presentations are scheduled each tutorial. *In your presentation, you will need to clearly explain a **primary** journal article on a developmental topic, published since 2015 in a developmental biology journal.* A detailed presentation schedule will be posted on the course OWL site, as well as a marking rubric for presentations and hints/guidelines by Dr. Damjanovski. Additionally, students are expected to listen to the presentations given by their peers and fill in a simple feedback form to be handed in at the end of each tutorial **(part of participation grade)**!

During the ------- lecture, you will be asked to sign up for your tutorial presentation date in groups. You can only sign up with a partner who is in your tutorial section. The TA and I will be present to help facilitate the formation of groups as finding partners may not be straightforward. Three groups in both sections 002 and 003 will begin with presentations on ----------respectively! If you are in sections 002 or 003, AND find a willing partner before --------, AND wish to present ----------, you can email Dr. Damjanovski sdamjano@uwo.ca to organize that ASAP.

As groups prepare for their presentations, should a member feel that their partner is not "carrying their weight", and should dialog with that partner not resolve this, they should approach the TAs. However, this cannot be done the day before, or the day of, the presentation. So, prepare early!

Tutorial Schedule:

Section 002:
Section 003:
Section 004:
Section 005:

Tutorial grading.

15% of your final course grade is obtained from the tutorial.
Presentation 12.5%: Expectations and a marking rubric for the presentation will be provided. Please follow the rubric and structure your presentation accordingly!
Participation 2.5%: Participation involves two components. Firstly, you must attend all 5 of your scheduled tutorials. Secondly, you must complete a "feedback" sheet that will be provided to you each tutorial. This sheet will require you to fill in 3 or 4 "facts" about **one** of the 3 tutorials presented that day. (If you presented that day you will still need to fill out a feedback sheet). The feedback sheet must be handed in as you leave the tutorial room. Under no circumstances will the feedback sheet be accepted after the tutorial time. It is your responsibility to hand in these sheets. If you attend a tutorial, you need to hand in a sheet! **Tutorial attendance is mandatory! You will lose 0.5% for each tutorial you miss without explanation, and you will lose all 2.5% if you miss (undocumented) more than 2 tutorials.**

Both the presentation marking rubric and the feedback form can be seen in the tutorial section in OWL, and they should be used as references as you prepare your presentation! Items such as your names, which presentation you are that day (1, 2, or 3), the details of the paper presented, the model used, and the research question – and other items listed in the marking rubric should be clearly present in your presentation – otherwise marks will be lost!

Tutorial Absences:

While there are 12 weeks during which tutorials can be scheduled, you will be attending only 5 tutorials! Please make every effort to attend your 5 scheduled tutorial dates. While there are provisions for missing tutorials, the size of the tutorial rooms and limited resources does not allow much flexibility should more than one student require such accommodation. Thus, arrangements must be made with Dr. Damjanovski ASAP – before the weekend of the week that you missed your tutorial. You can discuss the matter with Dr. Damjanovski or use a documented or undocumented absence through the Student Absence Portal and ask to try to organize to attend another tutorial date. **You must have approval from Dr. Damjanovski before you can attend a tutorial makeup date!**

If one person in the presentation group cannot present for a valid reason (see Academic Consideration for Student Absence), **the group presentation will be re-scheduled** and may involve a tutorial presentation to the course TAs and instructor alone, depending on circumstances.

The Final Exam will be scheduled by the registrar's office, www.registrar.uwo.ca . If you miss the Final Exam, please contact your faculty's Academic Counseling Office as soon as you can do so. 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 "Exam Conflict Situation" http://www.registrar.uwo.ca/examinations/exam_schedule.html

There will only be one make-up for the Final Exam. The make-up for the Final Exam will be written (tentative) the first Thursday following the beginning of the next term, in this case January 8, 2026, and will be organized by the Faculty of Science. If you miss the final and makeup exams for valid reasons, you will have to write the exam the next time the course is offered.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.
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

Accommodation and Accessibility

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at:https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf

Academic Consideration for Student Absence

Should students be absence from other course elements that can not be covered by through the Student Absence Portal, they need to provide valid reasons and seek approval. Approval can be granted either via the Dean's Office/Academic Counselling unit of your Home Faculty. If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in NCB 280, and can be contacted at scibmsac@uwo.ca. Their website is https://www.uwo.ca/sci/counselling/index.html .

Valid reasons for Academic Consideration for Student Absence may include (but are not limited to) medical or religious reasons.

Medical Accommodation

There is information below on: the university's medical illness policy; academic accommodation due to illness; and resources for emotional/mental distress.
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.
The Student Medical Certificate is available at
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

Religious Accommodation
Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar: https://multiculturalcalendar.com/ecal/index.php?s=c-univwo and http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Academic Policies

The website for Registrarial Services is http://www.registrar.uwo.ca.
In accordance with policy, http://www.uwo.ca/its/identity/activatenonstudent.html, 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 their official university address is attended to in a timely manner.

Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: https://www.uwo.ca/sci/counselling/

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 (SAS) at 661-2147 if you have any questions regarding accommodations.

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 Mental Health@Western (http://www.health.uwo.ca/mental_health) for a list of options about how to obtain help.
Additional student-run support services are offered by the USC, http://westernusc.ca/services .

Land acknowledgment

We 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. This land continues to be home to diverse Indigenous peoples (e.g. First Nations, Métis and Inuit) whom we recognize as contemporary stewards of the land and vital contributors of our society. More information about Indigenous Services (https://indigenous.uwo.ca/) and this Land Acknowledgement (https://communications.uwo.ca/comms/land-acknowledgement/) are available.