

# Bio3338a Developmental Biology 2024 Syllabus

## General Course Information

**Instructor: Dr. Sashko Damjanovski**

**Email: [sdamjano@uwo.ca](mailto:sdamjano@uwo.ca)**

Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

### List of 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](#)

### Modes of Delivery (as of September 2024):

The course will be delivered in person:

Lectures – In-person Monday and Wednesday @. Course material (PowerPoint slides, etc) will be posted to OWL: <https://owl.uwo.ca>. Other teaching activities aimed to reinforce lecture material may also be posted occasionally. No recordings of this material will be available.

Office Hour –.

Tutorials – Students must attend the (5) tutorials associated with their section.

Evaluations – Four online tests. In-person final exam, date to be set by the registrar.

### Should situations force REMOTE DELIVERY:

Lectures – Lectures will be asynchronous, with recorded lectures posted on OWL each week of the term. Teaching activities aimed to reinforce lecture material will be posted approximately every other week. All course material will be posted to OWL: <https://owl.uwo.ca>.

Office Hours - Synchronous office hours will be held weekly via Zoom (details posted on OWL).

Tutorials – Tutorials will be synchronous, during which students must attend a “live” tutorial – likely via Zoom.

Evaluations – All written evaluations will occur remotely via OWL.

**ALL “live” Zoom meetings (e.g. tutorials and office hours) will be recorded!**

### Technical Requirements

As this course **may involve** remote delivery it **REQUIRES**: a computer with working microphone and webcam, a stable internet connection, and the capability to run Zoom software. 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; update your browsers frequently. Students interested in evaluating their internet speed, please click [here](#).

## 2024 Course Description

First Bio3338a Class:

Tutorials begin:

Office hours:

Truth and Reconciliation Day:

Reading Week:

Last Bio3338a Class:

Exams:

### 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.

### **Tutorial Structure:**

**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 TA ([llyon2@uwo.ca](mailto:llyon2@uwo.ca))

Tutorials are Mondays (002 and 004) and Wednesdays (003 and 005) at 10:30-11:30 am, each in a designated room. Your tutorial schedule below, 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 ask at least one question (2.5%). **Tutorial attendance is mandatory! If you do not attend 5 tutorials, you will lose the entire 2.5% participation grade from your final course mark!**

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 2014 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 **ask at least one question during the term (part of participation grade)!**

**During the xxx lecture, you will be asked to sign up for your tutorial presentation date in groups. You can only sign up with people 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 sections 002 and 003 will begin with presentations on xxx! If you are in section 002 or 003, AND find a willing partner before xxxx, AND wish to present xxxxx, you can email Livy [llyon2@uwo.ca](mailto:llyon2@uwo.ca) to organize that ASAP.**

**As groups prepare for their presentations, should a member(s) 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 Absences:**

If you miss a tutorial (not the day you present) for a valid reason (see Academic Consideration for Student Absence, OR contact Dr. Damjanovski), you can make it up on a different day - please contact the TAs ASAP to coordinate. Do not just attend another tutorial as there are space restrictions. You must attend 5 tutorials and ask at least one question to receive your 2.5% participation grade.

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.

### **Tutorial Schedule:**

Section 002:

Section 003:

Section 004:

Section 005:

### **Course Materials**

All course material will be posted to OWL: <http://owl.uwo.ca> . Students are responsible for checking OWL on a regular basis. If students need assistance, they can seek support on the OWL Help page, or contact the Western Technology Services Helpdesk - 519-661-3800 or ext. 83800.

**Textbook:** Barresi and Gilbert, Developmental Biology **13th. Ed.** (recommended).

A reading list from the text will be provided in various lectures.

### **Methods of Evaluation**

**Material from tutorials will NOT be tested on Tests or Exam.**

Test 1	(- 15%)	
Test 2 (non-cumulative)	(- 15%)	
Test 3 (non-cumulative)	(- 15%)	
Test 4 (non-cumulative)	(- 15%)	
(makeup test – cumulative)	(?%)	
<b>Top 3 tests counted</b>	<b>- 45%</b>	
Tutorial presentation	- 12.5%	
Tutorial participation	- 2.5%	
Final exam (cumulative)	- 40%	- Scheduled by Registrar. 90 min (?) – in person

**TESTs will be online (Brightspace/Owl) and everyone will be universally accommodated. The time of any test will be the maximum accommodation any one student has with AE for a 30 min test.**

You will get a large time window during the day to write this test. Tests will be mixed format – T/F multiple choice, fill-in-the-blank, label diagrams, one-word answers.

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

## Tests and Test Makeup

There are 4 online tests scheduled. And a cumulative makeup test online xxxx for those that need it.

- if you write 4 tests, the top 3 will count, and will be worth 45% of your final grade.
- if you write 3 tests, they will be worth 45% of your final grade (no ACR or documentation needed for the 1 missed test). No makeup will be written.
- if you write 2 tests, they will be worth 30%, and you need to provide documentation to a counsellor for 1 missed test (NOT an ACR). With this documentation you will write a 15% cumulative makeup test.
- if you write 1 test, it will be worth 15%, and you need to provide documentation to a counsellor for 2 missed tests (NOT an ACR). With this documentation you will write a 30% cumulative makeup test.
- if you write 0 tests, you need to provide documentation to a counsellor for 3 missed tests (NOT an ACR). With this documentation you will write a 45% cumulative makeup test.

The cumulative test makeup will be online on xxxx. It will be similar format to the other tests. If you miss this makeup, with appropriate documentation for xxxx, the value of the makeup will be transferred to your final exam.

## Tutorial evaluation.

Of the final course mark, 15% is obtained from the tutorial.

Presentation 12.5%: Expectations and a marking rubric for the presentation will be provided.

Participation 2.5%: Participation involves two components. Firstly, you must attend all 5 of your scheduled tutorials. Failure to attend 5 tutorials will result in a loss of the 2.5%. Secondly, you must ask questions during the tutorial. **You must participate in some way – and your question must be reasonable and relevant to the presentation. (Not – “How do you think they could have improved this study?”)**.

**TA will keep record to make sure that everyone asks at least one question.**

If you miss a scheduled tutorial for a valid reason, please contact the TAs ASAP to coordinate making up the missed tutorial on a different day. Do not just attend another tutorial!

**IT IS YOUR RESPONSIBILITY TO MAKE SURE YOU SIGN THE ATTENDANCE SHEET EACH TUTORIAL SUCH THAT THERE IS A RECORD OF YOUR ATTENDANCE!**

**The Final Exam** will be scheduled by the registrar's office, [www.registrar.uwo.ca](http://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](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 xxxxx, 2025, 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](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf)

## Academic Consideration for Student Absence

Should students be absent from other course elements that can not be covered by an ACR<sub>2</sub> 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](mailto: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](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](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](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](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.