

DEVELOPMENTAL GENETICS
Biology (4540G)
Course Outline/Syllabus Winter 2024

1. Course Information and Prerequisites:

The prerequisite for this class is Biology 3338A/B or Biology 3597A/B.

Prerequisites: Unless you have either the prerequisites for this course or written special permission from your Dean's Designate (Department/Program Counsellors and Science Academic Counselling) 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.

2. Instructor Information

Professor	Email	Office	Phone	Office Hours
Miodrag Grbic	mgrbic@uwo.ca	WSC 342	519-661-2111 X 67776	12:30-13:30 Mo/Wed in person or zoom and/or other time on demand
GTAs:				

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

3. Course Description, Learning Outcomes, Schedule, Delivery Mode

Course Description: An overview of the genetic principles applied to the dissection of biological development in select model organisms. Particular emphasis will be placed on morphogens, signal transduction pathways, and genetic dissection of gene function.

Learning Outcomes and Objectives:

By the end of this course, students will be able to:

- 1.) Apply the genetic principles and tools for genetic dissection of developmental processes
- 2.) Apply the basic principles of the cellular mechanisms associated with development, such as morphogens, lateral inhibition and induction.
- 3.) Apply the knowledge of the principles that define model organisms and assessing information found in electronic databases and the primary scientific literature on select model systems used to study development.
- 4.) Read primary scientific papers in the field of developmental genetics at sufficient depth to be able to critically assess and synthesise the information.

Contingency Plan: This course will be delivered in-person, however in the unlikely event of any university-declared emergency, some or all of this course may be required to be delivered online, either synchronously or asynchronously. *The grading scheme will not change.* Any assessments affected will be conducted online as determined by the professor.

TENTATIVE CALENDAR 2024: *Students will be informed in advance of any upcoming changes.*

Day	Date	Content	Labs/ Tutorials
	8 Jan	First day of classes	
	17-25 Feb	Spring Reading Week	
	29 Mar	Good Friday holiday	
	8 Apr	Last Day of Classes	
	9-10 Apr	Study days	
	11-30 Apr	Final Exam period	

4. Course Materials

Course plan (see also course planning description)

Lectures tentative schedule:

Course plan (see also course planning description)

Jan. 8	Lecture 1 introduction to Developmental genetics Tutorial 1 Tutorial example of paper presentation
Jan 10	Lecture 2: Developmental genetics toolkit and concepts part 1 (chapter 1)
Jan. 15	Lecture 3 Developmental genetics toolkit and concepts part 2 (chapter 1) Tutorial 2 Paper assignments
Jan. 17	Lecture 4 Drosophila developmental genetics (Chapter 2)
Jan. 22	Lecture 5 Drosophila developmental genetics (Chapter 2) Tutorial 3 Student presentation Group 1
Jan. 24	Lecture 6 Drosophila developmental genetics (Chapter 2)
Jan. 29	Lecture 7 Drosophila developmental genetics (Chapter 2) Tutorial 4 Student presentation Group 2
Jan. 31	Lecture 8 Drosophila developmental genetics (Chapter 2)
Feb. 5	Lecture 9 Drosophila developmental genetics (Chapter 2) Tutorial 5 Student presentation Group 3
Feb. 7	Lecture 10 Drosophila developmental genetics ((Chapter 2)
Feb. 12	Lecture 11 Vertebrate development : experimental approaches (chapter 3 115-138) Tutorial 6 Student presentation Group
Feb. 14	Lecture 12 Developmental toolkit in vertebrate embryos signal transduction pathways
Feb. 16	Due date for first assignment
Feb. 17-25	Reading week
Feb. 26	Lecture 13 Developmental toolkit in vertebrate embryos signal transduction pathways Tutorial 7 Student presentation Group 5
Feb. 28	Lecture 14 Developmental toolkit in vertebrate embryos signal transduction pathways
Mar. 4	

Mar. 6 Lecture 15 Developmental toolkit in vertebrate embryos signal transduction pathways
 Tutorial 8 Student presentation Group 6

Mar. 11 Lecture 17 Stem cell specification

Mar. 13 Lecture 18 Stem cell specification
 Tutorial 9 Student presentation Group 7

Mar. 18 Lecture 19 Stem cell specification and applications in medicine

Mar. 20 Lecture 20 Stem cell specification and applications in medicine
 Tutorial 10 Student presentation Group 8
Due date for second assignment

Mar. 25 Lecture 21 Germ cell development and mammalian imprinting 409

Mar. 27 Lecture 22
 Tutorial 11 Student presentation Group 9

April. 1 Lecture 23 Evolution of development

April. 3 Lecture 24 Evolution of development
 Tutorial 10 Student presentation Group 10

April. 3 Lecture 25 Evolution of development
 Tutorial 12 Student presentation Group 10
 April 12 Lecture 26 Evolution of development

Final assignment due date: April 15th 2024

The first assignment will be posted on OWL on Jan. 15th and **due date for first assignment is Feb. 16th**

The second assignment will be posted on OWL on Feb. 16th and **due date for second assignment is Mar. 18th**

The Final assignment will be posted on OWL on Feb. 16th and **due date for first assignment is April. 15th**

Required Equipment:



Stable internet connection



Laptop or computer with webcam



Working microphone

Required Reading, textbook: Principles of Development / Edition 6 (Lewis Wolpert, Cheryll Tickle, Alfonso Martinez Arias) ISBN: 9780198800569 and selected papers from primary literature

All course documents and information (syllabus, lecture files, instructional documents, required readings, etc.) **will be posted to OWL and students are responsible for checking the course OWL site (<http://owl.uwo.ca>) on a regular basis for updates.** If students need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk, which can be contacted by phone at 519-661-3800 or ext. 83800.

Personal Response Systems ("Clickers") are not used in this course.

5. Methods of Evaluation

The overall course grade will be calculated as:

The overall course grade will be calculated as listed below:

Assignments (1) 25 %

Assignment (2) 25%

Presentation tutorial: 20%: group of 3 students preparing ppt presentation of paper from primary literature and broader research area

Final assignment 30%

1) Exams in the form of assignments: In lectures, principles are taught and applied to specific examples; in the assignments, undiscussed developmental examples are given to be analyzed and synthesized with the principles and approaches learned.

2) In the tutorial, primary scientific papers assigned by the instructor are presented by groups of 3 students preparing ppt presentation and critically discussing the paper and broader research field.

6. Student Absences

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

For work totalling 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

https://uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration.pdf.

The Student Medical Certificate is available at

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 are able to do so. 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).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under [Special Examinations](#)).

Note: missed work can *only* be excused through one of the mechanisms above. Being asked not to attend an in-person course requirement due to potential COVID-19 symptoms is **not** sufficient on its own.

7. 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 work with Accessible Education (formerly SSD), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf,

8. Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

[Optional; Duplicated from Section 2] In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

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.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

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

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Computer-marked multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

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>.

Professionalism & Privacy:

Western students are expected to follow the Student Code of Conduct. Additionally, the following expectations and professional conduct apply to this course:

- Students are expected to follow online etiquette expectations provided on OWL
- All course materials created by the instructor(s) are copyrighted and cannot be sold/shared
- Recordings are not permitted (audio or video) without explicit permission
- Permitted recordings are not to be distributed
- Students will be expected to take an academic integrity pledge before some assessments
- All recorded sessions will remain within the course site or unlisted if streamed

Optional: Terms of Use of Lecture/Lab/Tutorial Content:

Scholastic offences: are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

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

Plagiarism: Plagiarism is an academic offense and will not be tolerated. Students must write their essays and assignments in their own words. Whenever students take an idea or a passage from another author they must acknowledge their debt both by using quotation marks where appropriate, and by proper and accurate referencing in the form of scientific citations. All required papers will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Statement on Use of Electronic Devices During Tests/Exams:

Optional: Statement Use of Electronic Devices While Viewing Graded Tests/Exams in Class:

9. Support Services

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.

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 at

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

if you have any questions regarding accommodations.

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/>.

10. Equity, Diversity, Inclusion and Decolonization (EDID):

Land Acknowledgement: We 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. 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. Throughout Canada, North America, and the world, Indigenous Peoples are vital contributors to their communities, and we greatly value their presence, knowledge, and wisdom.