

# BI328 Developmental Biology Syllabus

(temporary – see Canvas for final version)

## Lecture:

**Tues/Thurs, 1015-1145**

Zoom link:

<https://uoregon.zoom.us/j/93279399995?pwd=MitoZGdxQ2RVSjVJWY2lQaVBTvNc5UT09>

Meeting ID: 932 7939 9995

Passcode: 233335

## Discussion:

### Lab:

**Wed, 915-1045** Zoom link: TBD

**Wed, 1115-1245** Zoom link: TBD

**Wed, 1315-1445** Zoom link: TBD

**Wed, 1515-1645** Zoom link: TBD

## Instructors

**Dr. Adam Miller** - [acmiller@uoregon.edu](mailto:acmiller@uoregon.edu)

Office hours: TBD

by request (send email) and will post Zoom link to Canvas

**Erin Jezuit** - [ejezuit@uoregon.edu](mailto:ejezuit@uoregon.edu)

Office hours: TBD

by request (send email) and will post Zoom link to Canvas

**Noah Dillon** - [ndillon2@uoregon.edu](mailto:ndillon2@uoregon.edu)

Office hours: TBD

by request (send email) and will post Zoom link to Canvas

**Katie Perez** – lab preparator

## Course description

This course will explore mechanisms underlying animal development, drawing on examples from different organisms to illustrate basic principles of cellular, molecular, and activity-dependent mechanisms that contribute to creating a complex organism. The course will emphasize conceptual understanding of the topic and critical thinking. Broad topics of consideration will range from fertilization, initial patterning and differentiation, and organogenesis, with developmental disorders explored throughout for context.

In addition, there is a companion discussion component. The main goals of the discussion are to explore concepts relevant to the course using primary literature to build an understanding of scientific technique, and to develop an independent research project that builds a hypothesis and rigorously defend it, and finally to present the proposal in a written and oral forms.

## Learning objectives

- Gain an understanding of mechanisms underlying development, including similarities and differences between different animal taxa;
- Explore how alterations in some aspects of development can result in human developmental disorders and the importance of animal research for elucidating

- underlying mechanisms;
- Become acquainted with reading, discussing, and examining primary research literature and critically evaluating data;
- Develop the ability to formulate hypotheses about the mechanistic bases for biological phenomena;
- Become acquainted with designing experimental strategies to test hypotheses about the mechanistic bases for biological phenomena;
- Develop skills in presenting scientific ideas in written and oral formats.

**Course timeline** (*tentative* – if changed, announcements in lecture and on Canvas)

1	Tues	Lecture1	Overview of Development
	Wed	no lab	
	Thurs	Lecture2	Making a difference - differentiation
2	Tues	Lecture3	Its all about Mom - maternal zygotic transition
	Wed	Lab1	Suggest - Giraldez et al, miR430
	Thurs	Lecture4	Breaking symmetry - dorsal/ventral axis
3	Tues	Lecture5	Gastrulation - anterior/posterior axis
	Wed	Lab2	Suggest - Nonaka et al, left/right
	Thurs	Lecture6	The final turn - left/right axis + <i>Review</i>
4	<b>Tues</b>	<b>Exam1</b>	<b>Exam</b>
	Wed	Lab3	Suggest - Pearson and Doe, temporal
	Thurs	Lecture7	Where'd your brain come from? - neural tube development
5	Tues	Lecture8	How to make billions and billions of neurons - neural stem cells
	Wed	Lab4	Suggest - Shah et al, CRISPR synapse
	Thurs	Lecture9	Research seminar – neural circuit formation
6	Tues	Lecture10	Super strong - the clock is ticking on the mesoderm
	Wed	Lab5	Suggest - Amacher lab paper, mesoderm timer
	Thurs	Lecture11	It's leg day - reuse of pathways for a different outcome
7	Tues	Lecture12	Not bound by its origin - neural crest + <i>Review</i>
	Wed	Lab6	Suggest - Genuth et al, NC migration
	<b>Thurs</b>	<b>Exam2</b>	<b>Exam</b>
8	Tues	Lecture13	Its guts all the way down - all about endoderm
	Wed	Lab7	Suggest - Bates et al, micro required
	Thurs	Lecture14	You are mostly not you - microbiome
9	Tues	Lecture15	More plastic than you think - sexual differentiation
	Wed	Lab8	Research project group work
	Thurs	Lecture16	Sex cells
10	Tues	Lecture17	New frontiers - making a brain in a dish
	Wed	Lab9	Research project presentations
	Thurs	Lecture18	Immortality - primordial germ cells + <i>Review</i>
11	<b>TBD</b>	<b>Final</b>	<b>Final</b> ***for date and time, check final schedule online***

## Course materials

Course organization is handled through Canvas. Readings relevant to each lecture, discussion materials, and discussion assignments will be handled through Canvas.

## Reading

We will use the below textbook. While it is not required, it is recommended. Having another perspective on the discussed topics is very useful for understanding the material.

Developmental Biology, 11th Edition, Gilbert and Barresi

- Available in the science library, critical supplement to class.

- Relevant sections posted on Canvas in the "Readings" section.

\*\*\* You can find free, older versions of this online. I will post notes on the general topics of interest, and you can track down the relevant sections in other books.

- Additional readings posted on Canvas in the "Readings" section.

## Lectures

- pdfs of the lectures will be posted on Canvas in "Lectures" section ASAP.

## Labs

Labs are a required part of the course. This is a lecture and lab course, and to receive full points for the course, you have to participate in both portions.

- Lab Readings, Handouts, and Questions will be posted on Canvas in "Labs" section Friday the week prior to class.

- Questions are due, on Canvas, before lab starts.

- Bring the Lab Handout to the class each week.

- Lab Assignments are due, on Canvas, **before** the next week's discussion starts.

## Grading policy

All work must be your own original work. Anything less will result in a Fail.

Final grades will be based on scores in Exam (30%), Final (35%), Lecture Participation (5%), Labs (20%), Research Project and Presentation (10%).

## Two exams and one final

- The **first two exams** will focus on the material of lectures presented in the six lectures preceding the exam (see Course Timeline). However, the nature of the course is to build on concepts, so the second exam will build on previous concepts.

- For the exam portion of the grade, only the best exam score of the two will be counted. In other words, the exam with the lowest score will be dropped. This allows for flexibility if an exam must be missed.

- An exam will be worth *approximately* 150 points (the exact number will depend on the number and types of questions). They will consist of a mix of multiple choice, fill in the blank, short answer questions, and critical readings and interpretations of primary literature papers/figures.

- The **final** will cover topics and lectures from the entire course, although many questions will focus on the final topics covered in the class after the 2<sup>nd</sup> exam. It will occur during final's week on the date as stated on this site: <http://classes.uoregon.edu/>

and more information can be found at:

<https://registrar.uoregon.edu/calendars/examinations#complete-final-exam-schedule>

- The **final must be taken** and will count towards the final grade.

- The final will be worth *approximately* 200 points (the exact number will depend on the number and types of questions). It will consist of a mix of multiple choice, fill in the blank, short answer questions, and critical readings and interpretations of primary literature papers/figures.

- Make-up exams/final will not be offered. The goal of dropping one exam grade from your final score is to allow flexibility as needed throughout the term.

### Point recovery on exams

- You can earn up to 25% of your missed points back on your exam. To get any points back I expect you to meet a high bar, the method to do so is below. You will only receive full points back if you complete all of the points below. **If you do not follow all of the below instructions, I will not evaluate the document, and you will receive no points.**

1. You must put your full name on the document.
2. You must address every mistake you made in the exam.
3. You must copy the question itself onto your document (text color black).
4. You must copy your incorrect answer onto the document (text color blue).
5. You must state the correct answer. Your statement must clearly discuss what led you to your misunderstanding (text color black).
6. You must then write a response as to why it is the correct answer. This must demonstrate your understanding of the concept. (text color red)
7. You must save the file as a pdf and the file name must be in the format: **lastName\_firstName\_examXmakeup.pdf** and you must write in *your names* for “lastName” and “firstName” and also write in the appropriate exam number for “X”.
8. You must email your response to the instructor directly, and it must be received by 11:59pm one week after the exam was returned to the class, or it will not count.

### Participation

The main goal is to create a learning environment that challenges the students to better learn the material. Critical to this effort will be lecture activities that will serve two main purposes: (1) engage all those taking the course and provide opportunities for problem solving, peer discussion, and higher-level synthesis and (2) provide examples of previous test questions to aid in exam preparation. These activities will take various forms throughout the course and will often include students being randomly selected and asked for answers. This will occur in an ongoing basis throughout the course, participation will be noted throughout. In addition, lab participation is critical to this course. Receiving an introduction into scientific exploration and experimentation is a key piece of this course, and the only way to gain such knowledge is to participated. Together, these pieces will constitute 5% of the final grade.

### Labs TBD

#### Participation

- You must be present in discussion to receive points for assignments related to that week.  
- There are 8 discussions during the term. Due to timing constraints, no makeup discussions are available. To accommodate any issues that might arise throughout the term, to receive full credit for discussion, you must participate in 7 of 8 labs during the term (i.e. you can miss one). Labs consist of three parts: 1) PreLab questions, 2) performing the experiments in the lab, 3) turning in a lab report. **You must do your own work on all turned in portions of your labs.**

- You must be prepared and bring materials to work together. During the discussion, the Handout will guide you as we proceed. You will be expected to keep notes on methods, observations, and conclusions related to the papers. The Handout will also ask several questions related to the material of the papers.

### PreLab Questions

Before each lab there will be PreLab questions based on the Lab Handouts. PreLab answers must be submitted on Canvas before your lab section begins. Each PreLab will be worth 3 points, making 21 points available for the term.

### Lab Report

Each Lab Report will require you to report on your previous weeks experiments. In addition, there will be questions related to the material of the lab. Each Lab Report must be submitted on Canvas before your lab section begins the following week. Each Lab Report will be worth 10 points, making 70 points available for the term.

### Research Project Paper and Presentation

The research project and presentation will be integrated into activities in lab but will constitute a separate final paper and presentation on the results of your research experiment. These will be due/presented at the final lab of the term. Both of these together will provide a total of 30 points. Points will be received for writing a research paper and presenting the results to the lab. **While this is a group research project, you must do your own work on your research paper and you must do your part for the presentation.**

- The research paper will focus on learning writing skills to articulate the developmental of a research hypothesis and experimental results that aim to test the idea. 15 points.

- The research presentation will focus on public speaking skills to articulate a research hypothesis and experimental results that aim to test the idea. 15 points.

If you have medically valid reasons and need accommodations for the term, please get in touch with the [AEC](#). And discuss this with me within the first week of the course in whatever manner is most comfortable for you.

**No early exams or labs can be given for this course.**

**No makeup exams or labs can be given for this course.**

### Class conduct

Class starts promptly at the time set in the schedule and we will proceed for approximately 1 hour with time interaction and for Q&A. Lab starts promptly at the designated time of your section and we will work on papers throughout. Please arrive on time and do not pack up before the conclusion of class. Arriving late and leaving early is disruptive to others around you and to the speaker. Do not talk during lecture in a volume audible to anyone but the intended recipient. Do not use electronic devices for non-class purposes. **In particular, silence your devices and be respectful to everyone in the course.**

Open inquiry, freedom of expression, and respect for difference are fundamental to a comprehensive and dynamic education. We are committed to upholding these ideals by encouraging the exploration, engagement, and expression of divergent perspectives and diverse identities. Classroom courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual

orientation, gender, gender variance, and nationalities. Our classroom is a learning environment, and as such should be a safe, inclusive and respectful place.

**Academic Integrity:** All students are expected to conform to the student conduct code (<http://dos.uoregon.edu/conduct> and <https://policies.uoregon.edu/vol-3-administration-student-affairs/ch-1-conduct/student-conduct-code>). As detailed in the policy, academic misconduct means the violation of university policy involving academic integrity. This includes cheating (“any act of deception by which a student misrepresents or misleadingly demonstrates that the student has mastered information on an academic exercise that the student has not mastered”), and plagiarism (“using the ideas or writings of another as one’s own.”) The instructor has a zero-tolerance policy for academic dishonesty. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures.

You are encouraged to discuss ideas with each other. However, all work submitted in this course must be your own. Instances of suspected cheating or plagiarism on any material will be referred to the Office of Student Conduct and Community Standards. I take such cases seriously and pursue charges of academic misconduct and their sanctions to the fullest extent allowable, including but not limited to a failing mark for the course.

**Inclusiveness:** UO is working to create inclusive learning environments. Please notify me if there are aspects of instruction or design of this course that result in barriers to your participation. You may also wish to contact the Accessible Education Center (541-346-1155; [usaec@uoregon.edu](mailto:usaec@uoregon.edu), [Accessible Education Center](#)).

### Campus resources to support your learning

*Tutoring and Academic Engagement Center* (<https://engage.uoregon.edu/services/>) Drop-in math and writing support in addition to tutoring, study skills support, and Class Encore. Located in the 4<sup>th</sup> Floor Knight Library (541) 346-3226, [engage@uoregon.edu](mailto:engage@uoregon.edu).

*Counseling Center* Call anytime to speak with a therapist who can provide support and connect you with resources. Located on the 2<sup>nd</sup> Floor of the Health Center(541)346-3227

*Accessible Education Center* The University of Oregon is working to create inclusive learning environments. The instructor believes strongly in creating inclusive learning environments. If there are aspects of the instruction or design of this course that result in barriers to your participation, please notify us as soon as possible. You are also encouraged to contact the Accessible Education Center. If you are not a student with a documented disability, but you would like for us to know about class issues that will impact your ability to learn, we encourage you to come visit during office hours so that we can strategize how you can get the most out of this course. Located on the 1<sup>st</sup> Floor of Oregon Hall (541) 346-1155, [uoaec@uoregon.edu](mailto:uoaec@uoregon.edu).

*Center for Multicultural Academic Excellence (CMAE)* mission is to promote student retention and persistence for historically underrepresented and underserved populations. We develop and implement programs and services that support retention, academic excellence, and success at the UO and beyond. We reaffirm our commitment to all students, including undocumented and tuition equity students. Located on the 1<sup>st</sup> Floor of Oregon Hall (541) 346-3479, [cmae@uoregon.edu](mailto:cmae@uoregon.edu).



The *UO Access Shuttle* is an on-campus ride service provided at no cost to students with conditions that limit mobility. More information and a sign-up form can be found on the parking & transportation department website: <https://parking.uoregon.edu/content/access-shuttle>.

## Discrimination and Harassment

### *Prohibited Discrimination and Harassment*

Any student who has experienced sexual assault, relationship violence, sex or gender-based bullying, stalking, and/or sexual harassment may seek resources and help at [safe.uoregon.edu](https://safe.uoregon.edu). To get help by phone, a student can also call either the UO's 24-hour hotline at 541-346-7244 [SAFE], or the non-confidential Title IX Coordinator at 541-346-8136. From the SAFE website, students may also connect to Callisto, a confidential, third-party reporting site that is not a part of the university.

Students experiencing any other form of prohibited discrimination or harassment can find information at [respect.uoregon.edu](https://respect.uoregon.edu) or [aaeo.uoregon.edu](https://aaeo.uoregon.edu) or contact the non-confidential AAEO office at 541-346-3123 or the Dean of Students Office at 541-346-3216 for help. As UO policy has different reporting requirements based on the nature of the reported harassment or discrimination, additional information about reporting requirements for discrimination or harassment unrelated to sexual assault, relationship violence, sex or gender based bullying, stalking, and/or sexual harassment is available at [Discrimination & Harassment](#).

### *Reporting*

The instructor of this class is a Student-Directed Employee. As such, if you disclose to me, I will respond to you with respect and kindness. I will listen to you and will be sensitive to your needs and desires. I will not judge you. I will support you. As part of that support, I will direct students who disclose sexual harassment or sexual violence to resources that can help. I will only report the information shared to the university administration when you as the student requests that the information be reported (unless someone is in imminent risk of serious harm or is a minor). Please note the difference between 'privacy' and 'confidentiality.' As a Student-Directed Employee I can offer privacy because I am not required to report certain information to the university. However, I cannot be bound by confidentiality as is the case with a counselor or attorney. Confidential resources mean that information shared is protected by federal and state laws. Any information that I as a student-directed employee receive may still be accessed by university or court proceedings. This means, for example, that I could still be called as a witness or required to turn over any related documents or notes that I keep.

Please note also that I am required to report all other forms of prohibited discrimination or harassment to the university administration. Specific details about confidentiality of information and reporting obligations of employees can be found at [titleix.uoregon.edu](https://titleix.uoregon.edu).

### *Mandatory Reporting of Child Abuse*

UO employees, including faculty, staff, and GEs, are mandatory reporters of child abuse. Child abuse pertains to individuals who are under the age of 18. This statement is to advise you that your disclosure of information about child abuse to the instructor may trigger my duty to report that information to the designated authorities. Please refer to the following links for detailed information about mandatory reporting: [Mandatory Reporting of Child Abuse and Neglect](#).

## Safe Ride

**541-346-7433 ext 2**

[pages.uoregon.edu/saferide](https://pages.uoregon.edu/saferide)

Safe Ride is an assault prevention shuttle that works to provide free, inclusive, and accessible alternatives to traveling alone at night for UO students, faculty, and staff.

We are a schedule-ahead service and riders can (1) call once we open to schedule a ride with a dispatcher or (2) leave a voicemail on the day of their ride request. We do not call riders ahead of time to confirm due to capacity constraints, but riders are always welcome to call us to double-check that their ride was scheduled. We are a feminist, 'for-the-students/by-the-students' organization and operate out of the Women's Center in EMU 12F.