Course	BIOL4308.001.22S Developmental Biology, 3 semester credit hours
Professor	Caitlin Maynard, PhD (she/her)
Term	Spring 2022
Meetings	Tues & Thurs, 2:30 – 3:45 pm, FO 3.222

Instructor's Contact Information

Office Phone	972-883-6895
Office Location	SLC 2.408
Email Address	Caitlin.maynard@utdallas.edu
Office Hours	1 – 2 pm in person, or by appointment

General Course Information

Pre-reqs and/or Co-reqs

BIOL3301 and BIOL3361/CHEM3361

Brief Course Description

In this course, we will discuss pioneering basic developmental biology research and apply these biological concepts to investigate human embryology and embryonic defects. Students are expected to read and be prepared to discuss the assigned primary scientific research articles, in addition to the textbook.

Learning Outcomes

By completion of the course, students will be able to:

1) Identify experimental approaches used to test the genetic and environmental control of development and morphogenesis.
2) Explain the general principles underlying vertebrate embryonic development.
3) Classify experimentally and environmentally induced developmental defects.
4) Analyze data and distill experimental results.
5) Evaluate the data in a primary scientific research article both orally (brief presentation) and in writing (term paper)**.**

Value: Being able to judge the validity of scientific data for yourself can help you be a better citizen and healthcare consumer and will apply to most careers.

Required Texts & Materials

Principles of Development by Lewis Wolpert, Cheryll Tickle, and Alfonso Martinez Arias (Oxford University Press) [**required**]

Assigned publications available online and through eLearning [required]

Course Policies

Classroom Conduct Requirements Related to Public Health Measures	UT Dallas will follow the public health and safety guidelines put forth by the Centers for Disease Control and Prevention (CDC), the Texas Department of State Health Services (DSHS), and local public health agencies that are in effect at that time during the Spring 2022 semester.
Course Overview	In this course, we will begin by exploring early developmental biology research, followed by an in-depth study of model organisms used to study embryogenesis (formation of the embryo). These model organisms include: - Fruit flies (*Drosophila*) - Frogs (*Xenopus*) - Zebrafish - Chicks - Mice After being introduced to these model organisms, we will study morphogenesis (formation of the body) and organogenesis (formation of organs and tissues). Seminal findings from model organism research have informed our understanding of human development and disease. Therefore, our discussion of cell differentiation, germ cells, post-embryonic development, and regeneration will build on our understanding of how these model organisms develop. In many cases, the genetic control of organ formation is evolutionarily conserved among disparate organisms. For example, the same molecular family regulates heart development in fruit flies and humans. Throughout the course, we will discuss how these molecular mechanisms are reactivated in human disease.
Class Materials	The instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course; however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.
Class Attendance and Participation	Attendance and regular class participation are expected. Students who fail to participate in class regularly are inviting scholastic difficulty. If you are unable to attend due to a scheduled event (interview, UTD sport/club event, etc.), notify the instructor of your absence in advance. If you are unable to attend due to illness or personal emergency, contact the instructor as soon as possible regarding your situation. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the Student Code of Conduct.
Class Recordings	Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student

	AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct. The instructor may record meetings of this course. These recordings will be made available to all students registered for this class if the intent is to supplement the classroom experience. If the instructor or a UTD school/department/office plans any other uses for the recordings, consent of the students identifiable in the recordings is required prior to such use unless an exception is allowed by law.
Grading Criteria	**-300 points for exams** --3 exams at 100 points each --Lowest exam score will be replaced with the average of your three exams. --Extra credit question(s) will be included in each exam. **-100 points for homework** --There are 11 HW assignments worth 10 points each. --The lowest HW score will be dropped. **-30 points for participation during Journal Clubs** --6 JC papers, 5 points per JC. --Participation grading criteria will be distributed. **-100 points for term project.** These points will be distributed: --Project proposal (20 points) --Documentation (20 points) --Term paper (40 points) --Oral presentation (20 points) **530 total possible points** Grades will be based on the total number of points earned: 514 or more for A+ 498 – 513 for A 477 – 497 for A- 461 – 476 for B+ 445 – 460 for B 424 – 444 for B- 408 – 423 for C+ 392 – 407 for C 371 – 391 for C- 355 – 370 for D+ 339 – 354 for D 318 – 338 for D- 317 or fewer for F
Make-up Exams	Make-up exams will be given if: (a) you were ill and have verifiable documentation as such, (b) you were detained the day and time of the exam, or (c) you made arrangements prior to the exam to attend a UTD-sanctioned event or an urgent family affair (e.g., funeral). In any of these cases, you must notify the instructor before the scheduled time of the exam. Otherwise, you will receive a 0.
Internet Policy	Access to a reliable Internet connection is required for this course. If you experience problems with your internet connection while working on this course, please attempt to find an alternate internet access point. It is strongly advised that you do not wait until the deadline to attempt to submit assignments or exams. If you find yourself in extenuating circumstances

	regarding to internet access, please contact the instructor by phone or email to communicate the issue as soon as possible.
Late Work	Late work will only be accepted under extenuating circumstances as judged by the instructor. Please communicate any such circumstances as promptly as possible.
Readings	Chapter readings from the textbook can be done before or after the associated lecture. Periodically, primary scientific research articles will be discussed in class. Students are advised to skim the paper before class. Data will be analyzed and discussed in class, sometimes in small groups, and homework will be assigned based on these papers.
Assignments	Weekly assignments will be posted on eLearning. These assignments build on the topics discussed in lecture and are intended to give you an idea of the types of data analysis questions that will be included on the exams. Homework assignments are due by 11:59 pm on the indicated dates on the course calendar. HW responses may be typed or handwritten and should be uploaded to eLearning via the provided submission link.
Term Project	The term project will involve both a written essay with references and a short oral presentation. See the Term Project handout on eLearning for specific instructions and grading criteria. A checklist and rubric will be distributed when the term project is discussed in class. Example papers will be peer reviewed in class. Motivated students may revise their final paper if desired.
Useful scientific resources	- **Pubmed** https://pubmed.ncbi.nlm.nih.gov/ - Eugene McDermott Library journal collection portal https://library.utdallas.edu/ (go to Journals tab)
Course Access and Navigation	This course can be accessed using your UT Dallas NetID account on the eLearning website. Please see the course access and navigation section of the Getting Started with eLearning webpage for more information. To become familiar with the eLearning tool, please see the Student eLearning Tutorials webpage. UT Dallas provides 24-hour eLearning technical support. The eLearning Helpdesk includes a toll-free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.
Technical Requirements	In addition to a confident level of computer and Internet literacy, certain minimum technical requirements must be met to enable a successful learning experience. Please review the important technical requirements on the Getting Started with eLearning webpage. You are required to have an appropriate computer and internet capabilities, which includes but is not limited to a microphone and reliable internet access.
Server Unavailability and other Technical Difficulties	UT Dallas is committed to providing a reliable learning management system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time-sensitive assessment activity, the instructor will provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and contact the eLearning Helpdesk. The instructor and the eLearning Help Desk will work with the student to resolve any issues as soon as possible.
Communication	This course utilizes online tools for interaction and communication. Some external communication tools such as regular email and a web conferencing tool will also be used during the semester. For more details, please visit the Student eLearning Tutorials webpage for video demonstrations on eLearning tools. Student emails will be answered within

	one business day under normal circumstances. If necessary, students may call between 8 am and 9 pm CT on business days.
Comet Creed	*This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same: "As a Comet, I pledge honesty, integrity, and service in all that I do."*
Academic Integrity	Each faculty member expects a high level of responsibility and academic honesty. Because the value of an academic degree depends on the integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work. Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to the submission of one's own work or material that is not one's own. In general, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion, and/or falsifying academic records. Students suspect of academic dishonesty are subject to disciplinary proceedings. Consultation with any tutoring service or homework help website (e.g., Chegg, CourseHero, or internet searches), taking of screenshots/photos/audio recordings, phone usage, and/or consultations with other students during exams are strictly forbidden. In accordance with University regulations, instructors are obligated to investigate and refer potential scholastic dishonesty instances to the Office of Community Standards and Conduct. You are encouraged to protect yourself by reading the information on the University OCSC website.
Academic Support Resources	*The information contained in the following link lists the University's academic support resources for all students.* *Please go to http://go.utdallas.edu/academic-support-resources.*
UT Dallas Syllabus Policies and Procedures	*The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.* *Please go to http://go.utdallas.edu/syllabus-policies for these policies.*
What You Can Expect from Me	- *I will be prepared and on time for class.* - *I will not leave early.* - *I will respect you and your opinions.*

Course Calendar Spring 2022

Day+Date	Class Meeting – Activity: Topic	Readings	**Assignment due** by 11:59 pm CT on eLearning
T Jan 18 ***Teams***	1 – Course Policies, Syllabus, Introductions		
H Jan 20	2 – Lecture: Ch 1 History and Basic Concepts	*PoD* Ch. 1	
T Jan 25	3 – Lecture: Ch 2 *Drosophila*	*PoD* Ch. 2	
H Jan 27	4 – Lecture: Ch 2 continued		**Ch 1 HW**
T Feb 1	5 – Discussion: ***Paper A*** Lecture: Ch 3 Vertebrate Development I	**Paper A**	
H Feb 3	6 – Ch 3 continued	*PoD* Ch. 3	**Ch 2 HW**
T Feb 8 ***In-person***	7 – Lecture: Ch 4 Vertebrate Development II	*PoD* Ch. 4, (4.1-4.17)	
H Feb 10	8 – ***Exam Review***		**Ch 3 HW**
T Feb 15	**EXAM 1 (class meetings 1-8 & related assignments)**		
H Feb 17	9 – Lecture: Ch 5 Vertebrate Development III ***Project Proposal overview***	*PoD* Ch. 5	**Ch 4 HW**
T Feb 22	10 – Ch 5 Lecture continued, Discussion***: Paper B***	**Paper B**	
H Feb 24	11 – Lecture: Ch 7 Morphogenesis	*PoD* Ch. 7	
T Mar 1	12 – Lecture: Ch 7 continued, Discussion***: Paper C***	**Paper C**	**Ch 5 HW**
H Mar 3	13 – Lecture: Ch 8 Cell differentiation & stem cells	*PoD* Ch. 8	
T Mar 8	14 – Lecture: Ch 8 continued, Discussion***: Paper D***	**Paper D**	**Ch 7 HW**
H Mar 10	15 – Lecture: Ch 9 Germ cells, fertilization, and sex determination	*PoD* Ch. 9	**Project Proposal**
T/H Mar 15/17	*No class – spring break*		
T Mar 22	16 – Lecture: Ch 9 continued, ***Exam 2 Review***		**Ch 8 HW**
H Mar 24	**EXAM 2 (class meetings 9 – 16 & related assignments)**		
T Mar 29	17 – Lecture: Ch 10 Organogenesis	*PoD* Ch. 10	**Ch 9 HW**
H Mar 31	18 – Lecture: Ch 10 continued, Discussion: ***View Exam 2, Review term paper example(s)***		
T Apr 5	19 – Lecture: Ch 12 Growth, post-embryonic development, and regeneration	*PoD* Ch. 12	
H Apr 7	20 – Lecture: Ch 12 continued, Discussion: ***Paper E***	**Paper E**	**Ch 10 HW**
T Apr 12	21 – Lecture: Ch 14 Evolution & Development	*PoD* Ch. 14	
H Apr 14	22 – Ch 14 continued, Discussion: ***Paper F*** ***Review presentation guidelines***	**Paper F**	**Ch 12 HW**
F Apr 15			**Term Paper**
T Apr 19	23 – ***Oral student presentations***		

H Apr 21	24 – ***Oral student presentations***	**Ch 14 HW**
T Apr 26	25 – ***Oral student presentations***	
H Apr 28	26 – ***Oral student presentations***	
T May 3	27 – ***Exam 3 Review***	
H May 5	*Makeup day in case of school closure, instructor illness, etc.*	
TBD	**EXAM 3 (class meetings 17 – 27 & related assignments)**	

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.