

Biology 804P- Developmental Biology Fall 2020

Instructor: Dr. Nicholas Hobbs

Office: 201F Bruner Hall

Office Hours: 10:00am – 11:00am Monday, 9:00am – 10:00am Wednesday, and 10:00am – 11:00am Thursday, or by appointment

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NOTE: Email is my preferred method of contact, if you inquire about a personal issue. Please give me 24 hours to respond to all emails. General questions about the course can be posted on the Frequently Asked Questions Discussion Board in Canvas.

COURSE INTRODUCTION

Developmental Biology focuses on the cellular and molecular mechanisms of animal embryogenesis, with an emphasis on comparisons of systems that illustrate common developmental strategies. It also serves as an integrative subject in biology by encompassing applications of biological disciplines from genetics and molecular biology to anatomy and evolution. Topics include fertilization, cleavage, gastrulation, axis specification, organogenesis, morphogens, and stem cells. This advanced course concerns the mechanisms responsible for building multicellular organisms. The continuum of development will be examined at the molecular and cellular levels.

REQUIRED TEXTBOOK

Developmental Biology (12th Edition), by Michael J. F. Barresi and Scott F. Gilbert

REQUIRED MATERIALS/SOFTWARE

As this is an online class, you will need a computer/laptop with access to the internet, a microphone, and the following programs: Microsoft PowerPoint, Microsoft Word, Adobe Acrobat or another program to read PDFs, and VidGrid (a screen capture program available through Canvas).

COURSE OBJECTIVES:

- 1) Describe the molecular and cellular mechanisms involved in controlling development.
- 2) Identify the similarities and differences in development between different animal taxa.
- 3) Describe environmental factors that affect development.
- 4) Apply critical thinking skills to construct an argument using data to support the claim.

GRADING SCALE

Grades will be calculated based on the following assignments: 1) introductory video (10 points) 2) fourteen lecture quizzes (10 points each for a total of 140 points) 3) three

lecture exams (100 points each for a total of 300 points) (300 pts), 4) participation in discussion boards (60 pts), and 5) a grant proposal/teaching laboratory protocol due at the end of the semester (50 pts; see term paper section for details). The final course grade (out of 560 possible points) is assigned as a letter grade using the following scale:

A+ 99-100%	B+ 87-89%	C+ 77-79%	D+ 67-69%	F < 60%
A 93-98%	B 83-86%	C 73-76%	D 63-66%	
A- 90-92%	B- 80-82%	C- 70-72%	D- 60-62%	

Grade assignments are final unless there is a calculation error. Scaling of grades is up to my discretion (don't count on it). **GRADES WILL NOT BE ROUNDED!** A 79.9% is a C+, not a B-.

LECTURE QUIZZES

Throughout the semester, you will be given fourteen quizzes worth 10 points each. Quizzes will make up 140 points of your grade. The purpose of these quizzes is to make sure that you are keeping up with the course material. Quizzes occur every week there is not a schedule lecture exam (see Course Outline section below).

LECTURE EXAMS

Each exam will consist of two parts. The first part, worth 30 points, will consist of multiple choice, true-false, and matching questions. The second part of each exam will be a take-home portion, consisting of problems and short essays. The exams are not comprehensive, in that, the questions asked will specifically address material covered since the last exam or in the case of the first exam, material since the first day of class. Everyone is expected to take all of the exams. **You must take all three exams to receive full credit. If you miss an exam, you will automatically fail and receive a letter grade of an "F".** The dates for the exams are listed on the schedule. **MAKEUP EXAMS WILL BE GIVEN ONLY UNDER EXTREME OR EXTENUATING CIRCUMSTANCES, WHICH CAN BE DOCUMENTED!** **In any and all cases, the final validity and acceptability of any excuse for absence are at my sole discretion.** I also realize that most, if not all, of you work to support your education, in ALL cases, however, your work schedule should accommodate your class schedule, and not the reverse. You should schedule around work during the class registration process, and not try to mold your existing class schedule around your work. Lastly, do not ask to take an exam at a different time because you have two tests on the same day; this is not a valid reason.

DISCUSSION BOARDS

Throughout the semester, students will be presented with several discussion topics related to the topics listed on the course outline below. Students will submit their posts onto the appropriate discussion board on Canvas. Discussion boards will be unlocked on Mondays at 12:01 AM Central Time and locked on Sundays at 11:59 PM Central Time.

Please see the separate rubric (posted on Canvas) for a complete breakdown of how I will be grading the discussion boards. Briefly, each discussion board is worth 10 points. Students will be scored on three criteria: 1) evidence of critical thinking (maximum of 4 pts), 2) minimum posting requirements (maximum of 3 points), and 3) responses to classmates and Dr. Hobbs (maximum of 3 points). Doing the minimum will only provide you with the opportunity to be scored and possibly earn 1 of the possible 10 points.

I do not expect you to spend 5 hours per week in each of these Discussion Boards. I expect, given the criteria listed in the rubric, for you to post **most days Monday-Friday**. I will not be keeping track of time spent on the Discussion Board, as it takes time to read and respond to the posts. You should be **wanting** to post every day. You do not need a peer-reviewed reference for every post, but if you are stating an opinion, you should provide support for it with data/evidence from a peer-reviewed source (not Wikipedia!).

Remember, Discussion Boards are for just that, **DISCUSSION!** Unless you are the first person answering the question(s) posted, you should **not** be starting a new thread. You should be replying to someone else. I am not concerned that everyone answers the posted question. The question or questions serve as a prompt for us to begin discussion. I want discussion, not simply posting for points.

What should this look like? (Example taken from Dr. Carlson's Bioethics of HeLa Cells)

Question: Do birds have fur?

Dr. Hobbs: Birds do not have fur, they have feathers. These feathers are used in mating dances and rituals. Many times, it is the male of the species that has the more ornamental feathers. This helps in attracting a mate (Leghorn 2016)

Reference: Leghorn F. 2016. Use of ornamental feathers in mating. *Ornithology*, 40:55-65. Doi:987.890/99

Reply from student 1: Dr. Hobbs, I disagree with you. Some birds do have fur. If we look at the ancient FleeceFlyer, it had a thick covering of purple fur, not feathers. It was a flying bird also. (Jurassic 2015)

Reference: Jurassic P. 2015. FleeceFlyer: The Original One-Eyed One-Horned Flying Purple People Eater. *Wilson's Transactions*, 56: 98-100.

Reply to student 1 from student 2: Do you have a picture of this? I would like to know how they determined this could fly? Was it large? This is amazing!

Yes, I will be in Discussion Board M-F, this is the reason I set it up. I love to discuss with you! I will play "devil's advocate". I will ask questions, etc. I am also **the only** person who gets credit for saying "Awesome! I agree!" or any phrases like this.

If you have any questions on the score you earned for the week, please simply email me. Also, please email any questions!

As this is an online format, tone and expression may not be readily discerned from your posts. Please avoid the use of online or text message abbreviations or symbols. Your posts should show respect for the views and experiences of your other classmates. I will remove any offensive posts from the board and these posts will not be considered for grading purposes.

TEACHING LAB PROTOCOL: Students will design a laboratory exercise examining a topic associated with developmental biology. Students will develop objectives, background, materials and methods, review questions, and a quiz on the lab. The due date for this paper is listed in the Course Outline section below. More detailed instructions on how to format and submit the lab protocol can be found on Canvas. Late papers will be penalized **20% per day late**.

COURSE OUTLINE:

Week	Beginning	Topic	Chapter(s)
1	Aug 24	The Making of a Body and a Field Specifying Identity	1 2
2	Aug 31	Differential Gene Expression	3
3	Sep 7	Cell-to-Cell Communication	4
4	Sep 14	Stem Cells	5
5	Sep 21	EXAM #1	
6	Sep 28	Sex Determination and Gametogenesis	6
7	Oct 5	Fertilization	7
8	Oct 12	Snails, Flowers, and Nematodes	8
9	Oct 19	The Genetics of Axis Determination in <i>Drosophila</i>	9
10	Oct 26	Sea Urchins and Tunicates	10
11	Nov 2	EXAM #2	
12	Nov 9	Neural Tube Formation and Patterning	13
13	Nov 16	Neural Crest Cells and Axonal Specificity	15
14	Nov 23	Development of the Tetrapod Limb	19
15	Nov 30	Regeneration	22
16	Dec 7	Development in Health and Disease	23
17	Dec 14	EXAM #3, TEACHING PROTOCOL DUE 12/14 by 11:59pm	

ACADEMIC INTEGRITY: UNK's policy is the maintenance of academic honesty and integrity is a vital concern of the University community. This policy is stated in the Graduate Catalog or at <http://catalog.unk.edu/graduate/academics/academic-regulations/expectations-in-the-classroom/academic-integrity-policy/>. Any student found in violation of this policy will be subjected to both academic and disciplinary sanctions. Violation of this policy includes Plagiarism, Cheating, Fabrication and Falsification, and Other Acts of Academic Dishonesty.

You are encouraged to make use of the online tools and resources provided at www.plagiarism.org/ to help you identify the various types of plagiarism, learn how to effectively paraphrase, as well as adequately cite your sources.

POLICY ON INCOMPLETES: Under very unusual circumstances an “Incomplete” may be assigned. To be considered for an “Incomplete” in Biology 886:

1. You must submit the reasons you cannot complete the scheduled work. This must include a copy of your class schedule and description of your responsibilities outside the classroom. This should be done in writing and include confirmation from your employer when appropriate.
2. You must specify the assignments you have missed and a schedule of plans to complete them

Students with Disabilities

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students with documented disabilities. To receive accommodation services for a disability, students must be registered with UNK Disabilities Services for Students Office, 172 Memorial Student Affairs Building, 308-865-8988 or by email unkdso@unk.edu

Students Who are Pregnant

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students who are pregnant. To receive accommodation services due to pregnancy, students must contact Cindy Ference in Student Health, 308-865-8219. The following link provides information for students and faculty regarding pregnancy rights. <http://www.nwlc.org/resource/pregnant-and-parenting-students-rights-faqs-college-and-graduate-students>

Reporting Student Sexual Harassment, Sexual Violence or Sexual Assault

Reporting allegations of rape, domestic violence, dating violence, sexual assault, sexual harassment, and stalking enables the University to promptly provide support to the impacted student(s), and to take appropriate action to prevent a recurrence of such sexual misconduct and protect the campus community. Confidentiality will be respected to the greatest degree possible. Any student who believes she or he may be the victim of sexual misconduct is encouraged to report to one or more of the following resources:

Local Domestic Violence, Sexual Assault Advocacy Agency 308-237-2599

Campus Police (or Security) 308-865-8911

Title IX Coordinator 308-865-8655

Retaliation against the student making the report, whether by students or University employees, will not be tolerated.

Problems/Questions

If you have questions then ask or come and see me or contact me via e-mail or phone. If you are having problems with the course come and see me before it is too late (not the week before your term paper is due or when the course is over).