

Developmental Biology BIO367

Spring 2020

"Our real teacher has been and still is the embryo, who is, incidentally, the only teacher who is always right." Viktor Hamburger

M W F 10:00 – 10:50am

NSC 210

Academic Credit = 3 hours

Instructors:

Dr. Denise Ferkey C530 (Course Coordinator)
Dr. James Berry D107

Office Hours: Instructors will establish office hours during the time they are teaching.

Textbook: "Developmental Biology" by Scott Gilbert and Michael Barresi (12th edition)
Sinauer Associates Inc., ISBN 978-1-60535-822-2 (hardcover) or
ISBN 978-1-60535-824-6 (looseleaf)

The accompanying website (www.devbio.com) can also be searched by topic.
Some additional materials may be provided as handouts.

Exams: There will be four exams given in this course. These will be given in the evenings of **Friday, Feb 28th (7pm, Cooke 121)**, **Friday, March 27th (7pm, Cooke 121)**, **Friday, April 24th (7pm, Cooke 121)** and during the final exam week. If you have a conflict with one of the exam times, you must inform the instructor immediately. If you miss an exam due to illness, you must present a signed doctor's note in order to make-up the exam. Rescheduled exams will be handled on a case-by-case basis and may be given as oral exams.

While the fourth exam will not be a cumulative final, be aware that material covered for the fourth exam will build on topics presented throughout the course.

Grading: Grades in this course will be determined on the basis of the four exams, which will be 100 points each. (Your final grade will be based on 400 total points possible.) The final grades will be assigned using the +/- grading system. For information on the **University's incomplete grading policy** see:

<http://undergrad-catalog.buffalo.edu/policies/grading/explanation.shtml#incomplete>

Questions regarding grading of an exam must be submitted in writing to the instructor giving the exam within one week from the time the graded exams are returned to the students. The student must check the grading key before asking for a regrade. Note that when a regrade is requested, the entire exam may be regraded.

Safe Space: It is critical to us that this classroom is a safe place that encourages learning for all students. We expect all students to be respectful of fellow learners regardless of race, ethnicity, citizenship, age, disability, gender, religion, sexual orientation or gender identity. Any type of harassment is against UB's Discrimination and Harassment Policy and will be reported as such. Please email us or make an appointment to speak with us if you have questions or concerns about this policy or about incidents in the classroom.

Academic dishonesty, in any form, will not be tolerated. Cheating on an examination will result in an “F” grade for the entire course and a notation in the departmental file and/or University file that the failing grade was assigned as a result of dishonesty. The **University academic integrity policy** can be found at:
<http://undergrad-catalog.buffalo.edu/policies/course/integrity.shtml>

University Accessibility Resources:
<http://www.student-affairs.buffalo.edu/ods/>

Tentative Lecture Schedule:

Instructor: Dr. Ferkey

<u>Date</u>	<u>Topic</u>	<u>Readings in Gilbert</u>
Background and Introduction		
1/27	Intro to Developmental Biology	Chapter 1 (pages: 1-11, 36-37)
1/29	Intro to Developmental Biology	Chapter 1 (pages: 17-20) Chapter 2 (pages: 39-41) Chapter 4 (pages: 100, 109-118, 123-127, 137)
1/31	Intro to Developmental Biology (movie: “A Dozen Eggs”)	
Early Events		
2/3	Gametogenesis	Chapter 6 (pages: 179, 196-206)
2/5	Gametogenesis and Fertilization	Chapter 7 (pages: 215-229, 233-240)
2/7	Fertilization	
2/10	Cleavage and Cell Cycle Control	Chapter 1 (pages: 14-17) Chapter 8 (page: 247)
Development in Selected Invertebrates		
2/12	Cell Adhesion, Extracellular Matrix	Chapter 4 (pages: 101-108)
2/14	Sea Urchin	Chapter 10 (pages: 303-318)
2/17	<i>C. elegans</i>	Chapter 8 (pages: 263-271)
2/19	<i>C. elegans</i>	Chapter 4 (pages: 138-139)

(end of material for 1st exam)

2/21	<i>Drosophila</i>	Chapter 9
2/24	<i>Drosophila</i>	
2/26	<i>Drosophila</i>	Chapter 12 (pages: 389-392)

Development of Selected Vertebrates

2/28	<i>Xenopus</i>	Chapter 11 (pages: 325-348)
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(EXAM 1, Dr. Ferkey)

3/2	<i>Xenopus</i>	
3/4	<i>Xenopus</i> (movie: "From Egg to Tadpole")	
3/6	Chick (Neurulation)	Chapter 13 (pages: 402-417)
3/9	Chick (Somitogenesis & Neural Crest)	Chapter 17 (pages: 507-527) Chapter 15 (pages: 441-457)
3/11	Limb Development	Chapter 19 (pages: 572-587, 591-594, 599-601)
3/13	Movie: TBD	
	(end of material for 2 nd exam)	
3/16 – 3/20	NO CLASS – Spring Recess	

Instructor: Dr. Berry

<u>Date</u>	<u>Topic</u>	<u>Readings in Gilbert</u>
3/23	DNA methylation, dosage compensation, genomic imprinting	TBD
3/25	DNA methylation, dosage compensation, genomic imprinting	
3/27	DNA methylation, dosage compensation, genomic imprinting	

(EXAM 2, Dr. Ferkey)

3/30	Transcription during development
4/1	Transcription during development

- 4/3 Transcription during development
- 4/6 RNA splicing and development (*Drosophila* sex determination)
- 4/8 RNA splicing and development (*Drosophila* sex determination)
- 4/10 Post-transcriptional control, maternal/zygotic transition
- 4/13 RNAi and microRNA regulation of development
- 4/15 RNAi and microRNA regulation of development
- 4/17 RNAi, microRNAs, and viral infections

(end of material for 3rd exam)

- 4/20 Extranuclear inheritance
- 4/22 Extranuclear inheritance
- 4/24 Plant development (life cycles)

(EXAM 3, Dr. Berry)

- 4/27 Plant development (meristems)
- 4/29 Plant development (determinant versus indeterminant)
- 5/1 Functional genomics and development
- 5/4 Functional genomics and development
- 5/6 Identification and characterization of developmental genes
- 5/8 Identification and characterization of developmental genes

(EXAM 4, Dr. Berry, to be scheduled during finals week)

Learning Objectives for BIO367 - Developmental Biology

Number	Program Learning Outcome	Depth	Specific outcome objectives for your course	Assessment instrument
2	Students will acquire laboratory and field skills necessary to answer biological questions and an ability to understand and employ scientific methodologies. They will be able to understand how to obtain, critically evaluate, and communicate experimental results	1	Gain an appreciation of the experimental tools used to understand normal and aberrant development.	Exam 1 (1-2 questions)
3	Students will gain understanding of how to integrate knowledge across biological sub disciplines and to synthesize examples, facts, or hypotheses from more than one level of organization into a coherent whole. They will also obtain the ability to integrate the physical sciences (chemistry, physics, and mathematics) with biology.	1	Understand how the integration of organismal, cellular and molecular analyses lead to a more complete understanding of complex developmental processes in plants and animals. Understand how abnormal development can lead to cancer and genetic disease.	Exam 2 (1 question) Exam 3 (1 question)
5	Students will be able to retrieve information from multiple sources, to analyze this information and communicate it precisely in both written and oral forms.	1	Be able to communicate an understanding of the material presented in this course in short answer and short essay exam questions.	Exam 3 (1 question)
8	Students will complete a more advanced level of study in areas of their choice to obtain a deeper coverage of at least one of the five broad areas.	2	Acquire in depth understanding and advanced knowledge of developmental processes in plants and animals.	Exams 1, 2, 3 (total course score)