

Developmental Genetics Course Syllabus

Class location: ARC-107

Class meeting times: Monday and Wednesday, 3:20-4:40pm

Instructor: Prof. Maureen Barr, 324 Life Sciences Building, 848-445-1639, barr@dls.rutgers.edu
Office hours: To Be Announced

Catalog description: Developmental genetics is the study of how genes influence the developmental processes of an organism. This course analyzes the field of developmental genetics, including the topics of gene regulatory networks, animal models, stem cell biology, regenerative medicine, birth defects research, and clinical genetics.

Course Goals: Students will (1) know key terms, concepts, and principles in developmental genetics, (2) integrate material learned in other Genetics and Life Sciences courses, and (3) apply genetic approaches, thinking, and reasoning to developmental problems covered in class or in assigned research papers.

Required/strongly recommended textbook

Developmental Biology 11th Edition, Scott Gilbert ISBN-13: 978-1605354705 or ISBN-10: 1605354708 (9th or 10th Edition is okay, you need to figure out corresponding pages and new materials.)

I also draw from this textbook, which is not required: *From DNA to Diversity*, Sean Carroll, ISBN: 9781405119504

Required readings: Required readings of review articles will be posted on the Sakai course site (below).

Websites

Course website Genetics 370 Spring 2018 at <https://sakai.rutgers.edu/portal>

The course website will have lectures and supplemental materials that are mentioned in class. You should also check the Sakai course site for announcements.

DevBio11e has a companion website (www.devbio.com) and Interactive Guide (Vade Mecum) (<http://labs.devbio.com>). I will use videos from the latter. You can access these resources using the registration code inside the cover page of your textbook.

Grading system

25% Homework (60 pts) and index cards/in class questions (40 pts)

25% Exam 1 = 100 pts

25% Exam 2 = 100 pts

25% Exam 3 (not cumulative) = 100 points

For only extenuating circumstances and only under the approval of Prof. Barr, a make-up exam will be offered at the end of the semester.

Grading will be based on the knowledge and mastery of developmental genetics. Rough grade cut offs are as follows: A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: 0-59

If you have a documented disability and wish to discuss academic accommodations, please contact Prof. Barr as soon as possible.

Academic integrity policy: Cheating and plagiarism will not be tolerated. Please refer to <http://academicintegrity.rutgers.edu/integrity.shtml>

Rules of conduct: No cell phones are allowed in class. Laptops can be permitted for the purpose of taking notes but not surfing the internet or playing games. Such behavior is distracting to other students in the class. If found violating this policy, a student will no longer be allowed to bring his/her laptop to class. Recording of lectures is not permitted.

Letters of recommendation from Dr. Barr: I will only write letters of recommendation for students that I know **VERY** well. These individuals typically (a) participate in class and attend office hours, (b) talk Genetics with me before or after class, and (c) are Genetics aficionados (i.e. teach their fellow classmates and get an A in the course). Once I agree to write a letter, you must provide the following: (1) unofficial transcript, (2) short statement of your career goals, (3) fully completed forms with waiver, (4) addressed/stamped envelope.

Email rules for contacting Dr. Barr: In general, I check and reply to student emails once a day. I am very selective in my replies, and there is no guarantee that I will respond to your message. The phone should only be used for absolute emergencies. *The most effective form of communication is talking before or after class.*

One Minute Assessment, for you and me!

You need to provide your own 3 X 5 index cards in lecture. At the end of every class, you will be given a question such as “What was the most interesting thing that you learned today?” or “What was the muddiest point?” You have one minute to write on this topic. This is part of my ongoing assessment of lecture effectiveness and class understanding.

Student # (1-60, assigned on day 1): _____
Name: _____
Date: _____
Question: What was the muddiest point?
Your response: The muddiest point was the....

All cards should be filled out the same way (above). ***These cards will be filed and they will be a record of both your attendance and your progress through the course.*** This exercise is required but the responses themselves are not graded.

What is the class like? Basic principles of genetics as they apply to development will be discussed in depth. Specific developmental mechanisms of action will be referred to and discussed, but students are not expected to have an advanced understanding of developmental biology. Approximately two thirds of the course will be based on the textbook, *Developmental Biology 11th Edition* by Scott Gilbert. The remaining third will be based on assigned readings of review papers on genetic dissection of development. Readings have not been determined yet because of the rapidly moving nature of these topics. Homework problems will be designed to reinforce principles and concepts discussed in class. Homework assignments will pose a question related developmental genetics, challenge students to synthesize in-class materials, and require analytical problem solving using genetic approaches. Homework assignments will be used as a learning assessment and also to stimulate in class discussions.

Tentative schedule

This schedule is only tentative and may change during the course of the semester. Reading is from DevBio11e by Gilbert, unless otherwise stated.

	Topic	
	1: Course Introduction	
	2: The Genetic Toolkit for Development	
	3: Genomic equivalence, epigenetics, and cloning by nuclear transfer	
	4: Cell-Cell Communication, specification and inductive signaling	
	Discussion and review sample questions	
Exam 1		
	5: Genetic dissection of developmental pathways	
	Spring Recess	
	6. Genetic dissection of developmental pathways	
	Discussion and review sample questions	
Exam 2		
	7. Hot topics in genetics	
	8. The Stem Cell Concept: Stem Cells and iPSCs	
	9: Regeneration, Aging, and Cancer	
	10: The Cilium: Organelle of the 21 st century	
Exam 3		