

Course Syllabus

Developmental Biology | PCB 4253 | U01 | Fall 2018



General Information

Instructor: Dr. Saldana

Class Meeting Time: Tu & Th 9:30am – 10:45am

Class Location: Green Library (GL) Room 245

Office: OE 210

Email: Canvas (preferred), asaldana@fiu.edu (mailto:asaldana@fiu.edu) (alternate)

Office Hours: Tue 3:30pm - 5:30pm & Thu 11:00am - 1:00pm, Fri 10:30am - 12:30pm, or by appointment



Course Description & Learning Outcomes

Have you ever wondered how a single cell can give rise to the more than 200 different types of cells in the human body? This is one of the fundamental questions the field of developmental biology seeks to answer. Developmental biologists study the molecular and cellular processes driving growth and development in various species. An understanding of these processes is essential to gaining insight into pathological conditions that arise as a result of developmental abnormalities. Some of the topics we will explore include the establishment of the axes of the body, the role of embryonic stem cells during development, limb formation, and brain development. Upon completing this course, you will be able to answer the following questions:

- How can a single fertilized egg give rise to so many different types of cells?
- What processes allow the cells of the body to become organized into functional structures?
- How do cells in developing organisms know when to stop dividing?
- What are the instructions present in germ cells that allow these cells to form new organisms?
- How do stem cells retain the capacity to give rise to various cell types and can this capacity be manipulated and used in medicine?
- How do genetic and environmental mechanisms alter development?



Prerequisites

You are expected to have completed and passed:

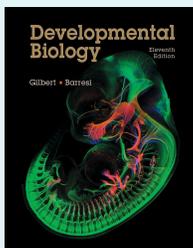
- Genetics (PCB 3063)

Knowledge from this course will be assumed.



Course Materials

Textbook Gilbert, S.F., & Barresi, M. (2016). *Developmental Biology, 11th ed.* Sunderland, MA. Sinauer Associates, Inc*. ISBN: 9781605354705 (**Required**)



* Sinauer Associates, Inc. is now part of Oxford University Press.

Additional Reading These will be posted to Canvas. Please bring a copy of the assigned readings to class as these will be used during in-class assignments.

iClicker You may purchase an iClicker device at the FIU Bookstore. You may also use the mobile REEF polling application (with an active registration) on your smartphone. We will be using the iClicker Cloud application for this course; however, you may still use the traditional iClicker remote. For information on how to register your iClicker remote, click [here](https://macmillan.force.com/iclicker/s/article/How-to-Register-an-iClicker-Remote) [↗ \(https://macmillan.force.com/iclicker/s/article/How-to-Register-an-iClicker-Remote\)](https://macmillan.force.com/iclicker/s/article/How-to-Register-an-iClicker-Remote). Please make sure to include your Panther ID in your registration.



How will you succeed?

Come to class prepared. You can do this in one of two ways: (a) read the assigned pages (this is the best way to prepare), or (b) review the figures and read figure legends prior to coming to class. Doing this will help you remember and understand the material much better than attending the lecture with a blank slate.

Go over your notes after class. Reviewing your notes right after class will help you retain the information. It will also make you aware of important points you may have missed or are confused about, and allow me the opportunity to help you with sufficient time.

Communicate. If you are not doing as well as you would like, **please seek help early on in the semester. If you wait until the end of the semester to email me about your grade, there is little, if anything, I can do to help you then.**



Attendance

You are expected to attend class regularly, to arrive on time, and to remain in class until the end of the period. In order to get the most out of this class, it is imperative that you attend and take good notes. Doing so will help you master the material, and serve as a guide when preparing for exams. You are responsible for all material covered in class, as exams will include material not directly addressed in your textbook. Additionally, although attendance is not a graded component, there will be iClicker questions, quizzes and assignments for which you need to be present in class.



All lecture notes, reading materials, and scores for assignments/exams will be posted to Canvas. Canvas will also be used to communicate any changes to the class schedule; however, you will also be notified of any changes during class. If you are new to Canvas, please take some time to familiarize yourself with the interface. For more information on how to use Canvas, please visit <https://fiu.instructure.com/courses/2629/pages/canvas-student-overview>. For technical difficulties, please visit <http://lms-help.fiu.edu/>.



Grading Policy

Grading Scale

Letter	Range %
A	100% - 90%
B+	<90% - 86%
B	<86% - 80%
C+	<80% - 76%
C	<76% - 70%
D	<70% - 60%
F	<60%

Final grades will be assigned according to the scale indicated above and will not be rounded-up. Please do not ask whether you can get a grade bump, grade bumps are unfair to other students, so the answer to that question is emphatically NO. Finally, please do not ask whether you can turn in extra credit to increase your grade. Extra credit opportunities are outlined under the assignments section, and will be equally provided to all students. You will be assigned the grade you earned for the course as per the scale specified above.

Grade Breakdown:

Four Unit Exams @ 13% Each	52%
Three In-Class Exercises @ 4% Each	12%
Two In-Class Paper Assignments @ 4% Each	8%
Clicker Questions	8%
Ten Quizzes @ 2% Each	20%
TOTAL	100%



Exams, Assignments & Make-ups

Exams: There will be 4 exams during the semester. Although each of the first 4 exams will not be cumulative in nature, you may be asked to synthesize material learned in previous units. The exams will cover the class lectures as well as the assigned readings from the textbook. Each exam will count toward 13% of your final grade. We do not drop any exam score in this course.

Exams will consist of a variety of questions (T/F, fill-in the blank, multiple choice, short answer). Please be prepared to provide either your Panther ID card or a Florida driver's license on the day of the exam. If for any reason exam dates or the material covered in an exam have to be adjusted, you will be given at least one week's notice in class and via Canvas.

Make-ups: *If you are unable to take an exam because of an emergency, you will be given a make-up exam as long as you are able to provide valid documentation (please see below for descriptions of what constitutes an emergency and the forms of accepted documentation). Please note that the make-up exam may not be in the same format as the exam given during class. Although there may be circumstances that may prevent you from giving prior notification for missing the final exam, you must email me within 48 hours of the missed exam **with the reason and appropriate documentation**, so that proper accommodations can be made.*

In-Class Exercises: In-class exercises will be designed to help you prepare for the exams. I will present you with questions and/or case studies, which you will discuss and answer with your group (3-4 students). Canvas groups will be created at least two weeks prior to the class exercise and you will need to sign up for a group no later than 24 hours before the scheduled exercise. At least one group member will need to bring an internet-enabled electronic device (preferably a laptop) since the assignment will be collected electronically (as a Canvas submission). Although these exercises will be open-book, studying the pertinent chapters and lecture notes prior to class will greatly increase your chances of doing well. Each in-class exercise will count toward 4% of your final grade.

Please note: if you arrive more than 15 minutes late on the day of an in-class assignment, you will need to work on the assignment individually.

Make-ups: *If you are unable to make it to class for an in-class exercise because of an emergency, you will be given a make-up as long as you are able to provide valid documentation. You must email me within 48 hours of the missed exercise. (please see below for descriptions of what constitutes an emergency and the forms of accepted documentation).*

In-Class Paper Assignments: There will be 2 in-class paper assignments throughout the semester. These assignments will consist of short-answer questions based on scientific articles, which will be posted on Canvas at least one week prior to the day of the assignment. At least one group member will need to bring an internet-enabled electronic device (preferably a laptop) since the assignment will be collected electronically (as a Canvas submission). As with in-class exercises, you will be working in groups of 3-4 students and will need to sign up for a group no later than 24 hours prior to the assignment. Please read the articles ahead of time, and bring them to class on the day of the assignment. Each assignment will count toward 4% of your final grade. **Please note: if you arrive more than 15 minutes late on the day of an in-class assignment, you will need to work on the assignment individually.**

Make-ups: *If you are unable to make it to class for an in-class paper assignment because of an emergency, you will be given a make-up as long as you are able to provide valid documentation. You must email me within 48 hours of the missed assignment. (please see below for descriptions of what constitutes an emergency and the forms of accepted documentation).*

Reading Quizzes: There will be 10 quizzes throughout the semester; each of these will count toward 2% of your final grade. Quizzes will be on the material from the chapters indicated on the schedule and will take place during the first 10 minutes of class. The purpose of the quizzes is to help you stay on top of the reading and to give you an idea of the types of questions you can expect to see on the exams.

Make-ups: *If you miss a quiz as a result of an emergency, you will be given a make-up as long as you are able to provide valid documentation. You must email me within 48 hours of the missed quiz. (please see below for descriptions of what constitutes an emergency and the forms of accepted documentation).*

iClicker Questions: There will be a series of clicker questions throughout each lecture. These questions are designed to test your comprehension of the material, and better prepare you for exams. For these questions, you will be allowed to discuss the answers with your classmates before making your selections. You will receive 1 point for each correct answer and 0.5 points for incorrect answers. Clicker questions will count toward 8% of your final grade. Although we will have clicker questions during all 19 lectures (not including the first week), I will only count your 16 best days toward your final grade, so this component of your grade is relatively simple to earn

if you show up to class.

You will have one week to purchase and register your clicker device. We will be using iClicker Cloud in this course; however, you can still use a traditional iClicker remote. For information on how to register your iClicker remote click [here](https://macmillan.force.com/iclicker/s/article/How-to-Register-an-iClicker-Remote) (<https://macmillan.force.com/iclicker/s/article/How-to-Register-an-iClicker-Remote>). You may also use the Reef Polling App; however, this will require you to pay a subscription fee if you have not already subscribed to use the app (there is a 2-week free trial period). Please verify at the end of the first week that your clicker scores are visible to you in the Canvas "Grade Center." Although we will have clicker questions during the first week of class, these are meant to make sure that your iClicker is working and to give you an idea of the types of questions you will see throughout the semester; consequently, these will not count toward your grade. **Clicker questions that will count toward your grade will begin on Tuesday, August 28th. Make sure you register your iClicker before then.**

Make-ups: *There are no make-ups for clicker questions because answers are provided during class; however, as specified above, your 3 lowest clicker scores will be dropped to account for unforeseen circumstances. It is your responsibility to check your clicker points online within a week of these posting to Canvas. This is done so that you can make sure that your clicker is logging in your answers. This allows the instructor to fix any small technical issues. After that one week, there's nothing that the instructor can do if a student's clicker wasn't logging in points.*



Emergencies

Emergencies are unforeseeable and unavoidable events that preclude you from being able to attend class. Emergencies include:

- Serious illness/hospitalization
- Car accident in which you were directly involved
- Death of an immediate family member

You will be required to provide documentation (e.g., doctor's note [Note: NOT an R.N.'s note], copy of death certificate, police report) in order to be excused and be able to make-up the final exam or an assignment. The documentation provided must be a valid and verifiable written letter signed by a professional or some other type of irrefutable proof.

Examples that do not constitute an emergency:

- Having a mild cold
- Getting stuck in traffic
- Oversleeping
- Scheduling a routine doctor's appointment (i.e. not related to an emergency) on the day of an exam/assignment

Although some of these are unfortunate circumstances, they are not emergencies and will not be treated as such.



Incomplete Grades

In the case of extreme circumstances arising from reasons beyond your control (please, see description of emergencies above), an incomplete (IN) grade may be given at the instructor's discretion. Please Note:

- Official documentation will be required (NO exceptions)
- **IN grades will not be given prior to the drop date or after the course has ended.**
- In order to receive an IN grade, you must have completed at least half of the assigned course work and have a passing grade.
- An unfortunate event, such as the death of a family member, does not automatically guarantee that you will be granted an incomplete for the course. Each case will be carefully evaluated, and your overall performance will be taken into account when

making a decision.

- If granted an incomplete, the course must be completed within two terms; otherwise, you will receive the grade you would have earned without being given credit for any incomplete assignments (this will likely be a failing grade).



Class Rules

In order to promote an environment conducive to learning, please adhere to the following common-sense rules:

- **Cell phone use:** Cell phones are not allowed during class, please keep them silenced/off. We will have a short break during most classes for students to use the restrooms, check messages/calls, etc.
- **Computers:** Although I encourage students to take handwritten notes, because [research](https://www.npr.org/2016/04/17/474525392/attention-students-put-your-laptops-away) [\(https://www.npr.org/2016/04/17/474525392/attention-students-put-your-laptops-away\)](https://www.npr.org/2016/04/17/474525392/attention-students-put-your-laptops-away) suggests these are more effective, you may use your laptop in class to take notes. Please refrain from web surfing/social media/Amazon/etc. Not only is this a poor use of the class time you have already paid for, but it is also disruptive to your fellow classmates.
- **Audio/video recording & photography:** Audio recording is allowed, but please **NO video recording/photography**, as all material will be posted on Canvas.
- **Posting class material:** Posting of class lecture notes and course materials to the internet is not allowed and is considered an infringement of copyright law, as images from textbooks are the property of the publisher.
- **Disruptive Behavior:** It is everyone's responsibility to maintain a professional environment that promotes learning, minimizes distractions, and protects students'/instructor's rights. Students who fail to adhere to the standard code of conduct set forth by the instructor and the [FIU Student Handbook \(https://fiu.instructure.com/courses/18476/files/2682034/download\)](https://fiu.instructure.com/courses/18476/files/2682034/download) [\(https://fiu.instructure.com/courses/18476/files/2682034/download\)](https://fiu.instructure.com/courses/18476/files/2682034/download) may be subject to disciplinary action in accordance to the FIU Student Handbook.



Academic Conduct

Academic Honesty: The purpose of this course, and of a college education in general, is to provide you with the knowledge you will need as a professional, and to empower you to think independently. Cheating and plagiarism are counterproductive to this purpose, disrespectful to your colleagues, and will not be tolerated. How you conduct yourself now is an indication of the kind of professional (physician, dentist, pharmacist, nurse, scientist, etc.) you will be in the future. Any instances of cheating will be dealt with according to FIU's academic misconduct policies, which can be found at: <http://academic.fiu.edu/polman/sec2web.htm#two-forty-four> [\(http://academic.fiu.edu/polman/sec2web.htm#two-forty-four\)](http://academic.fiu.edu/polman/sec2web.htm#two-forty-four). In addition to cheating, please remember that lying to a faculty member to obtain an unfair advantage is also consider academic misconduct and grounds for expulsion from the university.

Sexual Harassment: Sexual harassment violates student and faculty rights and will not be tolerated. FIU's sexual harassment policy can be found in the [FIU Student Handbook \(https://fiu.instructure.com/courses/18476/files/2682034/download\)](https://fiu.instructure.com/courses/18476/files/2682034/download) [\(https://fiu.instructure.com/courses/18476/files/2682034/download\)](https://fiu.instructure.com/courses/18476/files/2682034/download).



ADA Accommodation Statement

Students with documented disabilities as per the Americans with Disabilities Act (ADA) and the Rehabilitation Act of 1973 (PL 933-112 Section 504) may request accommodations (physical or academic) by contacting the Disability Resource Center (tel. 305-348-3532,

TTY/TDD 305-348-3852). The student is also responsible for contacting the instructor as soon as possible, so that reasonable accommodations can be made.



Email Etiquette

Please feel free to email me if you have any questions or concerns. I will try to respond within 24-48 hours, but please keep in mind that I may not be able to respond right away if I receive your email in the evening or over the weekend. If you have questions about the material presented in lecture, it is preferable that you come to office hours. If you wait until the day before an exam to contact me about a doubt/question regarding the material for the exam, I may not see your email until the next day.

If you have a general question about due dates or assignments, you can also post your question to the Canvas Chat (see course menu) or the General Discussion Board. If your question/concern is of a personal nature (i.e. illness, grades), please contact me directly. In order to ensure that your email receives a timely response, please make sure to:

- **Include your name** (this is particularly important if you do not use Canvas to contact me, as your name may not appear associated with your email)
- Include a relevant subject heading (**Please DO NOT just hit reply to the last email/announcement you received from me**).
- Include **PCB 4023 in the subject heading** to ensure your email does not end up in my spam/junk folder
- **Use Canvas email** whenever possible.



Letters of Recommendation

I am happy to write letters of recommendations for students who earned a good grade (A- or better) in at least one of my courses. Nevertheless, keep in mind that earning a good grade in the course does not guarantee that I can write a letter for you. If you did not participate in class and never attended office hours, I will not have anything to say about you, since I do not know you, thus I will not be able to write you a letter.

All requests for letters of recommendations must wait until after the final grades for the course are posted (unless you have taken another class with me and have done well in that class). Please keep in mind that I will need at least a month's notice to be able to provide you with a letter, and will require the following from you:

- a copy of your unofficial transcript
- your curriculum vitae or resume
- a statement of purpose (for medical and dental school applicants)
- information about how/where to submit your letter.
- anything that can help me make a stronger case for my recommendation

To get an idea of the importance of asking letters of recommendations from faculty who actually know you, I recommend you take a look at the perspectives and advice of students admitted to the University of Michigan Medical School (click [here](https://medicine.umich.edu/medschool/education/md-program/md-admissions/faqs/been-there-done-amcas) [↗](https://medicine.umich.edu/medschool/education/md-program/md-admissions/faqs/been-there-done-amcas) (<https://medicine.umich.edu/medschool/education/md-program/md-admissions/faqs/been-there-done-amcas>)). You will find a common thread among the best advice these medical students provide for those who are thinking of applying to medical school.

SEE NEXT PAGE FOR CLASS SCHEDULE



Schedule

Date	Day	L#*	Topic	Reading	Quiz
Aug 21	Tue	1	Introduction	Syllabus (READ IT)	-
			Developmental Biology Main Questions	Ch. 1 (pp. 1-11)	
Aug 23	Thu	2	Developmental Biology Overview	Ch. 1 (pp. 11-37)	-
Aug 28	Tue	3	Cell Specification	Ch. 2 (pp. 29-43)	Syllabus & Ch. 1
Aug 30	Thu	4	Differential Gene Expression I	Ch. 3 (pp. 45-68)	
Sep 4	Tue	5	Differential Gene Expression II	Ch. 3 (pp. 68-91)	Ch. 3 (45-68)
Sep 6	Thu	6	Cell-Cell Communication I	Ch. 4 (pp. 95-118)	
Sep 11	Tue	7	Cell-Cell Communication II	Ch. 4 (pp. 118-139)	Ch. 4 (95-108)
Sep 13	Thu		In-Class Exercise 1	Chapters 3 & 4	-
Sep 18	Tue		EXAM 1	Chapters 1, 2, 3 & 4	-
Sep 20	Thu	8	Stem Cells	Ch. 5 (pp. 143-149, 153-158, 167-177)	-
Sep 25	Tue		In-Class Paper Assignment 1	See Canvas	-
Sep 27	Thu	9	Fertilization	Ch. 7 (pp. 217-233)	Ch. 5
Oct 2	Tue	10	Fertilization	Ch. 7 (pp. 233-248)	Ch. 7 (217-233)
Oct 4	Thu	11	Early Dev: <i>Drosophila</i> Axis Specification	Ch. 9 (pp. 277-301)	-
Oct 9	Tue	12	Early Dev: <i>Drosophila</i> Axis Specification	Ch. 9 (pp. 301-307)	Ch. 9 (277-293)
Oct 11	Thu		In-Class Exercise 2	Chapters 7 & 9	-
Oct 16	Tue		EXAM 2	Chapters 5, 7 & 9	-
Oct 18	Thu	13	Early Development: Invertebrates	Chapter 10	
Oct 23	Tue	14	Early Development: Amphibians	Ch. 11 (pp. 333-365)	Ch. 10 (311-326)
Oct 25	Thu	15	Early Development: Amphibians	Ch. 11 (pp. 333-365)	
			Early Development: Birds & Mammals	Ch. 12 (pp. 379-380, 391-410)	
Oct 30	Tue	16	Early Development: Birds and Mammals	Ch. 12 (pp. 379-380, 391-410)	Ch. 11 (333-348)

Nov 1	Thu	17	Ectoderm: Neural Tube Formation & Patterning	Chapter 13	
Nov 6	Tue		In-Class Exercise 3	Chapters 11 and 12	
Nov 8	Thu		EXAM 3	Chapters 10, 11, 12, 13	
Nov 13	Tue	18	Ectoderm: Brain Growth	Chapter 14	
Nov 15	Thu	19	Ectoderm: Neural Crest	Chapter 15 (pp. 463-488)	
Nov 20	Tue	20	Mesoderm: Somites I	Chapter 17 (pp. 539-560)	Chapter 14
Nov 22	Thu		Happy Thanksgiving		
Nov 27	Tue	21	Mesoderm: Somites II	Chapter 17 (pp. 539-560)	Ch. 15 (463-488)
			Development in Health & Disease	Chapter 24	
Nov 29	Thu		In-Class Paper Assignment 2	See Canvas	-
TBA	TBA		EXAM 4	Chapters 14, 15, 17, 24	

*L#: Lecture Number

This syllabus and schedule are subject to change