

Cell and Developmental Biology (BIOL 205) Section 007

SPRING 2019

MONDAY, WEDNESDAY, and FRIDAY 11:15AM-12:05PM

Dr. Blaire Steinwand and Dr. Celia Shiao

201 COKER HALL

INSTRUCTORS:

Dr. Blaire Steinwand

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Office location: Coker 212

Office hours: Thursday 1:00-3:30pm and Friday 12:10-1pm

I use Signup on Sakai, please be sure to sign up prior to attending office hours!

I am also available by appointment

Dr. Celia Shiao

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Office hours: TBA

Graduate Teaching Assistants: Morgan Ferone (morgan_ferone@med.unc.edu) and Angana Mukherjee (amukherjee@med.unc.edu)

Supplemental Instruction: Grace Tan (gstan96@live.unc.edu) and Olivia Manning (omanning@live.unc.edu)

Peer Mentors: Andrew Cesmat (apcesmat@live.unc.edu), Andrew Harvey (abharvey@live.unc.edu), Sydney Tickle (sydney14@live.unc.edu), John Lemoine (johnlem@live.unc.edu), Kate Spencer (spencerk@live.unc.edu), Kevin Liu (liukev@live.unc.edu)

SAKAI SITE

(you must have an onyen to log on – go to <https://itsapps.unc.edu/improv/#UserCreateOnyenPlace:createOnyen> if you do not have an onyen.) The Sakai site will have postings from lectures such as outlines, power point slides, lecture goals and objectives, and supplemental material we mention in lecture. We will also post announcements regarding student concerns on this site. It is your responsibility to check it regularly.

REQUIRED TEXT for 1st half of the course:

Essential Cell Biology. 4th Edition by Alberts, Bray, Hopkin, Johnson, Lewis, Raff, Roberts, Walter

REQUIRED TEXT for 2nd half of the course: Principles of Development. 5th Edition by Lewis Wolpert, Cheryll Tickle, and Alfonso Martinez Arias

REQUIRED PREREQUISITE: Basic knowledge of biology and chemistry as demonstrated by a C- or above in BIOL202

QUIZZES: (7% of your grade): Quizzes will be due the morning before nearly every class period at 9:00AM. All quizzes are timed. **It is your responsibility to complete the guided reading assignment prior to starting the quiz so that you can finish within the hour that you are given.** Late quizzes will receive a zero. **DO NOT ASK US TO MAKE AN EXCEPTION TO THIS RULE.**

PARTICIPATION (6% of your final grade): As an incentive to come to class prepared and be engaged, 6% of your grade will come from a program called Poll Everywhere that you use through your laptop or mobile phone and in-class activities. Note - missing just a couple of classes can quickly affect your participation grade! **NOTE: even if you have previously registered as a poll everywhere user, you MUST REGISTER AGAIN as Poll Everywhere at UNC-Chapel Hill has undergone some recent changes. Please visit poll.unc.edu to register and check to see that your poll responses are going through regularly!**

DIGITAL ETIQUETTE: This course will require you to use your laptop and/or cell phone during class time. While I recognize that you are an excellent multi-tasker, research suggests that your peers are not. Please be respectful of your classmates and restrict your use of digital devices to course content. If we see that you or your peers are distracted, we will ask you to put your devices away and you may forfeit your ability to earn participation points that day. There will be times when you have completed your work or answered a poll question, but your peers have not. We ask that you assist your peers when appropriate or use the time to review your notes while you wait. I understand that your devices connect you to your friends and family (a wonderful thing!) but the classroom should be a place apart, however briefly (even if it seems like an eternity to you), from the outside world and distractions. You will learn more if you concentrate on the course while you are here and your classmates will thank you for not impeding their ability to learn.

PIAZZA: There are hundreds of you and your questions are important to us. However, it is often difficult for a single instructor with so many students to address all of the e-mails that are received throughout the course of the semester. Therefore, in order to address your questions and concerns more efficiently, we will be using an online platform called "Piazza" this semester. You may post any questions that you have about the course to this site at any time and they will be answered by either a fellow student, a TA, or your instructor. Your questions may be more general and may relate to the course itself or they may be more specific and instead relate directly to content and/or material from class. In any case, Piazza will help you get them answered ASAP. With the exception of private/personal questions and concerns (which are always welcome in our inboxes) please direct all questions to this discussion board. You will receive a welcome e-mail from your instructor granting you access to the course within the first week of the semester and can start using Piazza right away. **If you have not received a welcome e-mail, sign up here: piazza.com/unc/spring2019/205**

WHAT YOU SHOULD BRING TO CLASS EVERY DAY:

1. Outlines from Sakai when available (either printed or on laptop).
2. Extra blank paper for drawings, notes, activities etc. (or tablet computer for drawing)
3. 3 x 5 index cards (with or without lines, preferably white).
4. POLL EVERYWHERE device: either your cell phone for texting or laptop/ipad/smartphone for web access

RECITATION (7% of your final grade): Attendance and participation in one of the recitations sections is required. These recitations are an extension of the class and allow time to go beyond material in class. They are not “help sessions”, but they will extend your knowledge of the field of cell and developmental biology. Material covered in recitation may be covered on exams too. For recitation, you may also be given pre-class assignments or in-class assignments, each worth 5 points, that are designed to reinforce and deepen your understanding of the material related to the course. Your pre-class recitation assignments must be printed and handed in at the beginning of recitation. In-class assignments are typically group problems. You must work out this problem in groups and turn in one answer on behalf of the group during the recitation period. There will be no make-up opportunities for in-class assignments if you do not attend a recitation in a given week. You may earn up to 5 additional points, during each half of the semester for class participation during the recitation sessions. If you are unable to attend the recitation for which you are registered one week, you may attend another section with prior permission of the TAs if there is room in another section. There is a maximum capacity for each section so please do not assume that you can attend another section if you miss a recitation.

SUPPLEMENTAL INSTRUCTION (SI) and Peer Mentoring: ALL of the supplemental instructors and peer mentors were VERY successful students of ours and are equipped with the knowledge and skills that you need to be successful in this course. The SI instructors will offer multiple sessions of supplemental instruction a week and will post problem sets for you on Sakai. Peer mentors will offer one-on-one mentoring every week throughout the semester. They will all also be in class helping you learn! In order for them to help you approach and analyze problems, you should bring problem sets and questions to them outside of class. Each session held by an SI instructor or peer mentor will be scheduled for 1 hour - the times and location of these sessions will be posted on Sakai during the first week of class. You are not required to attend either, but **attendance is highly recommended**, since this is your opportunity to get more help in this course. It is also worth noting that they have all seen many of my exams! I suggest you fit SI or peer mentoring into your schedule and attend weekly as if it is a required class. The contact information for all of SI instructors and peer mentors is listed above. Check Sakai for times and locations.

What is the difference between SI and peer mentoring?

SI is going to look like a review session with a group of students in attendance each week. Peer mentors are offering more “one-on-one” help. If you are interested in reviewing the topics more broadly – attend SI. If you feel you need to sit down with someone and work one-on-one, see a peer mentor!

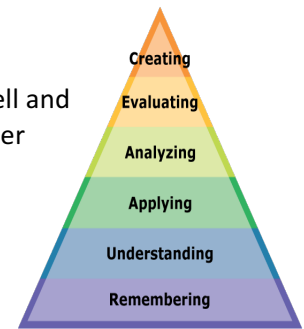
DIVERSITY STATEMENT: The Department of Biology values the perspectives of individuals from all backgrounds reflecting the diversity of our students. We broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. We strive to make this classroom and this department an inclusive space for all students.

And, this brings us to the goals of our course...

1. To provide you with the core principles of cell and developmental biology.

The lecture and the book will introduce you to the fields of cell biology and developmental biology. After this class, you will have a basic understanding of cell and developmental biology and will be equipped to build upon this content with upper level courses in biology.

Amended Bloom's Taxonomy: developed as a method of classifying educational goals for student performance evaluation. You should think about this as you study for exams and ask yourself, am I using different kinds of thinking?



2. To gain higher level thinking skills that are necessary for scientists.

To the right you can see the "Amended Bloom's Taxonomy" pyramid. It was developed as a method of classifying educational goals for student performance evaluation. You should be well-equipped at remembering facts and content with good study habits. We are looking for you to apply and analyze. You are UNC students, we KNOW you can memorize! Move beyond this level of thinking. How can we achieve this? We will have in-class questions to practice this immediately and you will have homework problems to practice on your own. We will also explore classic experiments as a way of thinking through the logic of experiments and to see where the foundations of this content come from. While these may be new ways of thinking for you, practice is the most important way to gain these skills. FYI: UNC's medical school sees this is an excellent pre-req course for medical school because it teaches students to think.

3. This course should excite you about cell and developmental biology and its applications to our real lives!

TESTS: There will be three tests and a final exam given during the semester.

The format will include both multiple choice and open-ended questions. The first 3 exams are not cumulative tests and will only cover the material specified on the course schedule, and the final exam will be cumulative covering the Developmental Biology section only (with a focus on post-Exam 3 materials). However, each part of the course builds on the knowledge from earlier sections, so do not "mentally erase" fundamental concepts from earlier in the semester. For all exams, you will need your PID number as identification on your exam sheet. Additionally, you may be asked to verify your identity, so it is required that you bring your one-card to each exam. Failure to produce a one-card or other picture ID if asked may result in a zero on that exam. Test material to study: guided readings, outlines, homework, lecture notes and activities, recitation assignments, and power point slides. Therefore, to succeed in this class, it behooves you to take each reading/homework seriously and actively engage in all class discussions. There is no option to drop a test grade and there are no extra credit options. Exams must be taken on the dates indicated during the regular class period; no makeup exams except in special circumstances, i.e., medical or family emergency documented in writing prior to missing the exam. The instructors reserve the right to give oral make-up exams. If you still do not understand content after your exam has been graded and would like to discuss concepts, we encourage you to meet with your TA or instructor. If you have a question related to points deserved, you must put it in writing no more than 5 days after an exam has been returned to you and turn it in to your instructor.

NOTE: the final exam is Tuesday May 7th at noon.

Special note on the Final Exam: Final is on the last day of the FINALS period. NO make-up exam past this exam date and time for *any* reason. If you miss or do not take your Final exam by May 8th at noon, you will receive an incomplete grade. If you must reschedule your Final exam due to an exceptional circumstance that is granted by the Dean's office, you will need to take your Final early prior to May 8th at noon. You will also need to provide the documentation from the Dean's office and arrange the schedule with Dr. Shiau before the last day of class on 4/26/19. There will be NO exception to this policy.

HOW IS YOUR GRADE DETERMINED? (Note: there will be no changes to HOW your final average is calculated at the end of the semester and THERE IS NO EXTRA CREDIT...so please don't ask! You will get the grade you EARN!) Your final average is calculated:

Total for the semester =
(0.20 x test) + (0.20 x test) + (0.20 x test) + (0.20 x final exam) + (0.07 quizzes) +
(0.06 x participation score) + (.07 x recitation)

HONOR CODE: All work done in this class must be carried out within the letter and spirit of the UNC Honor Code. You must sign a pledge on all graded work certifying that no unauthorized assistance has been given or received. You are expected to maintain the confidentiality of examinations by divulging no information about any examination to a student who has not yet taken that exam. You are also responsible for consulting with your professors if you are unclear about the meaning of plagiarism or about whether any particular act on your part constitutes plagiarism. Please talk with the professor if you have any questions about how the Honor Code pertains to this course.

COPYRIGHT POLICY

All course materials including your class notes and in-class assignments are covered by University Copyright Policy, @<http://www.unc.edu/campus/policies/copyright%20policy%2000008319.pdf>. This means it is illegal and an honor code offense to share your notes or any other course materials items with anyone not directly affiliated with this particular class. No uploading to non-class sharing sites.

Class Schedule for BIOL205

Date	Lecture #	Assignments to be completed BEFORE this class	Topics covered
Wed 1/9	1	Read Chapter 1. Sakai quiz due at 9AM: Introduction to the cell	Introduction to Cell Biology
Fri 1/11	2	None.	Introduction to Cell Biology continued
RECITATION (1/9-1/11): NO RECITATION			
Mon 1/14	3	Read pages 121-155 in Chapter 4 and complete the guided reading assignment. Sakai quiz due at 9AM: Protein structure and function	Protein structure and function
Wed 1/16	4	Read pages 164-167 in Chapter 4 and complete the guided reading assignment on western blotting. Sakai quiz due at 9AM: How we study proteins	How we study proteins – Methods and Tools
Fri 1/18	5	None.	How we study proteins – Methods and Tools
RECITATION (1/14-1/18): Read “Production of unique immunotoxin cancer therapeutics in algal chloroplasts” and complete the pre-recitation assignment on methods utilized in this paper. Bring the pre-recitation assignment COMPLETED to recitation. In addition, print “Handout 1” and bring a copy to recitation. You will work through the handout in recitation.			
Mon 1/21	6	HOLIDAY – NO CLASS	
Wed 1/23	7	Read pages 359-374 in Chapter 11 and complete the guided reading assignment. Sakai quiz due at 9AM: Membranes	Membrane Structure and function
Fri 1/25	8	Read pages 383-398 in Chapter 12 and complete guided reading assignment. Sakai quiz due at 9AM: Membrane transport	Membrane transport
RECITATION (1/21-1/25): Bring the “Figure facts template” to recitation. You will complete this IN recitation.			
Mon 1/28	9	Read pages 487-518 in Chapter 15 and complete guided reading assignment Sakai quiz due at 9AM: Targeting and trafficking	Targeting and trafficking
Wed 1/30	10	None.	Targeting and trafficking cont.

Fri 2/1	11	Catch up	
RECITATION (1/28-2/1): Complete the figure analysis questions for your assigned expert group and bring a completed copy to recitation. See Sakai for expert group assignments.			
Mon 2/4	12		EXAM 1
Wed 2/6	13	Read and complete guided reading assignment Sakai quiz due at 9AM: How cells harvest energy	How cells harvest energy
Fri 2/8	14	None.	How cells harvest energy
RECITATION (2/4-2/8): NO RECITATION			
Mon 2/11	15	Read and complete guided reading assignment on Chapter 16 Sakai quiz due at 9AM: Cell communication	Cell communication
Wed 2/13	16	None.	Cell communication
Fri 2/15	17	Read and complete guided reading assignment on Chapter 17 Sakai quiz due at 9AM: Cytoskeleton	Cytoskeleton
RECITATION (2/11-2/15): Finish completing the figure analysis questions for your assigned expert group and plan chalk talks (see rubric posted to Sakai). View exam 1			
Mon 2/18	18	None.	Cytoskeleton
Wed 2/20	19	Read and complete guided reading assignment on Chapter 18 Sakai quiz due at 9AM: Cell cycle	Cell cycle
Fri 2/22	20	Read and complete guided reading assignment on Chapter 20	Cell adhesion
RECITATION (2/18-2/22): Figure presentations and paper summaries. Come prepared to present your assigned figure and bring a printed copy of the rubric.			
Mon 2/25	21	Review	Review
Wed 2/27	22		EXAM 2
		<u>Developmental Biology section begins</u>	
Fri 3/1	23	Read pg. 1-13, but not cell biology box 1B Sakai Quiz Due before class	Historical origins and overview of developmental biology

Mon 3/4	24	Read pg. 13-24 "A conceptual tool kit" for studying development Sakai Quiz Due before class	Fundamental principles of developmental biology
Recitation (3/4-3/8) Feldman et al 1998 on zebrafish organizer and germ layer formation			
Wed 3/6	25	Read pg. 24-31, 46-48 (section 2.8) Sakai Quiz Due before class	Fundamental principles of developmental biology and Drosophila development
Fri 3/8	26	Read pg. 37-53, 61-68 Sakai Quiz Due before class	Development of the Drosophila body plan (continued)
Mon 3/11	SPRING BREAK		
Wed 3/13	SPRING BREAK		
Fri 3/15	SPRING BREAK		
Mon 3/18	27	Read pg. 20, 128-140 Sakai Quiz Due before class	Experimental approaches and techniques in vertebrates
Recitation (3/18-3/22) Go over Exam 2			
Wed 3/20	28	Read pages 410-416 starting from "The Development of germ cells" which includes 10.1 – 10.4 Read pages 424-429 "Fertilization" section Read pages 369-376 "Cleavage and formation of the blastula" section Sakai Quiz Due before class	Germ cell development, Fertilization and Cleavage
Fri 3/22	29	Read pages 257-260 sections 6.11-6.13 Sea urchin organizer and tissue induction Read pages 145-152. Chapter 4 part 1. Setting up the body axes in Xenopus, Nieuwkoop center Sakai Quiz Due before class	Fertilization and cleavage, start of Mesoderm and endoderm induction
Mon 3/25	30	Read pages 152-174. Chapter 4 part 2. Tissue induction, germ layer formation, Spemann organizer Sakai Quiz Due before class	Mesoderm and endoderm specification, neural induction, and Spemann organizer
Recitation 3/25-3/29 Feldman et al 1998 on zebrafish organizer and germ layer formation			

Wed 3/27	31	Read page 149, section 4.2; 377-391 "Gastrulation movements" Sakai Quiz Due before class	Gastrulation
Fri 3/29	32	Read pages 377-391 "Gastrulation movements" Sakai Quiz Due before class	Gastrulation
Mon 4/1	33	None.	Review
Recitation (4/1-4/5) Feldman et al 1998 on zebrafish organizer and germ layer formation			
END OF MATERIAL FOR EXAM 3			
Wed 4/3	34	EXAM 3	
Fri 4/5	35	Neural tube and cell migration: Read pages 392-399 through section 9.16; Neural crest: 223-224 section 5.14 Sakai Quiz Due before class	Neurulation and neural crest
Mon 4/8	36	Placodes: Gilbert textbook Chapter 16, pages 517-520 (posted in Resources on Sakai) Sakai Quiz Due before class	Neural crest and placode
Recitation (4/9-4/11) Feldman et al 1998 on zebrafish organizer and germ layer formation			
Wed 4/10	37	Read pages 207-213 Sakai Quiz Due before class	Somite formation and A-P patterning and Hox gene complex
Fri 4/12	38	Read pages 213-222, Starting in section 5.10 Sakai Quiz Due before class	Somite formation and A-P patterning and Hox gene complex
Mon 4/15	39	None.	Somite formation and A-P patterning and Hox gene complex
Recitation (4/15-4/19) Go over Exam 3			
Wed 4/17	40	Read pages 520-524 sections 12.1-12.2; 527-528 section 12.5 (Hox genes and hindbrain); 530-531 section 12.7 (Shh and D-V patterning) Sakai Quiz Due before class	Nervous system development
Fri 4/19	41	HOLIDAY-NO CLASS	

Mon 4/22	42	Read pages 538-542 section 12.12-12.13; 547 box 12C; 554-560 Synapse sections 12.19-12.21 Sakai Quiz Due before class	Nervous system development
Recitation (4/23-4/27) Review and Feldman et al 1998 on zebrafish organizer and germ layer formation			
Wed 4/24	43	Read pages 309-318 sections 8.1-8.2; 325-328 section 8.7; 334-338 sections 8.11-8.12. Sakai Quiz Due before class	Cell differentiation and stem cells
Fri 4/26	44	None.	Cell differentiation and stem cells and Review
FINAL EXAM – TUESDAY, MAY 7th – 12pm noon Coker 201 Final exam will be cumulative covering the Developmental Biology section of the course.			