

Cell and Developmental Biology (BIOL 205) Section 006

FALL 2018

Dr. Blaire Steinwand and Dr. Frank Conlon
Monday, Wednesday, and Friday 10:10am - 11:00am
201 COKER HALL

INSTRUCTORS:

Dr. Blaire Steinwand

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I am also available by appointment

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Graduate Teaching Assistants: Lauren Browning (lmb94@live.unc.edu) and Angana Mukherjee (amukherjee@med.unc.edu)

Supplemental Instruction: Grace Tan (gtan96@live.unc.edu)

Peer Mentors: Olivia Manning (omanning@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!**

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.

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.

Recitation sections: 601, 602, 603, 604, and 605 in Genome Science Building 1374. Sections 606, 607, and 608 TBA

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!

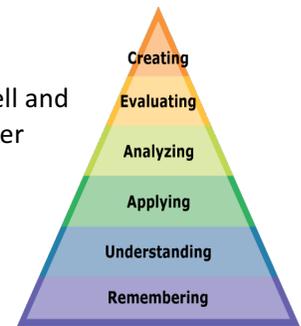
DIVERSITY STATEMENT: The Department of Biology values the perspectives of individuals from all backgrounds reflecting the diversity of our students. We broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, 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. These are not cumulative tests and will only cover the material specified on the course schedule. 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 December 14th at 8am in Coker 201.

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:

$$\text{Total for the semester} = (0.20 \times \text{test}) + (0.20 \times \text{test}) + (0.20 \times \text{test}) + (0.20 \times \text{final exam}) + (0.07 \text{ quizzes}) + (0.06 \times \text{participation score}) + (.07 \times \text{recitation})$$

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.

Schedule for the first half of BIOL205

Date	Lecture #	Assignments to be completed BEFORE this class	Topics covered
Wed 8/22	1	Read Chapter 1. Sakai quiz due at 9AM: Introduction to the cell	Introduction to Cell Biology
Fri 8/24	2	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
RECITATION (8/21-8/24): NO RECITATION			
Mon 8/27	3	None.	Protein structure and function
Wed 8/29	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 9/31	5	None.	How we study proteins – Methods and Tools
RECITATION (8/27-8/31): 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.			
Mon - NO CLASS – HOLIDAY! 9/3			
Wed 9/5	6	Read pages 359-374 in Chapter 11 and complete the guided reading assignment. Sakai quiz due at 9AM: Membranes	Membrane Structure and function

Fri 9/7	7	Read pages 383-398 in Chapter 12 and complete guided reading assignment. Sakai quiz due at 9AM: Membrane transport	Membrane transport
Mon 9/10	8	Read pages 487-518 in Chapter 15 and complete guided reading assignment Sakai quiz due at 9AM: Targeting and trafficking	Targeting and trafficking
NO RECITATION (9/3-9/7)			
Wed 9/12		None.	Targeting and trafficking
Fri 9/14	10		Review
NO RECITATION (9/10-9/14): Go over methods used in "Production of unique immunotoxin cancer therapeutics in algal chloroplasts" and think about the big picture of the work reported in this paper.			
Mon 9/17	11		EXAM 1
Wed 9/19	12	Read and complete guided reading assignment Sakai quiz due at 9AM: How cells harvest energy	How cells harvest energy
Fri 9/21	13	None.	How cells harvest energy
RECITATION (9/17-9/21): Complete the figure analysis questions for your assigned expert group. See Sakai for expert group assignments.			
Mon 9/24	14	Read and complete guided reading assignment on Chapter 16 Sakai quiz due at 9AM: Cell communication	Cell communication
Wed 9/26	15	None.	Cell communication
Fri 9/28	16	Read and complete guided reading assignment on Chapter 17 Sakai quiz due at 9AM: Cytoskeleton	Cytoskeleton
RECITATION (9/24-9/28): Go over exam 1			
Mon 10/1	17	None.	Cytoskeleton
Wed 10/3	18	Read and complete guided reading assignment on Chapter 18 Sakai quiz due at 9AM: Cell cycle	Cell cycle
Fri 10/5	19	TBA	Review
RECITATION (10/1-10/5): Figure presentations and paper summaries. Come prepared to present your assigned figure.			

Mon 10/8	20	Review	EXAM 2
Wed 10/10	21		Cell adhesions

Class Schedule for Developmental Biology

Date	Class #	Guided reading assignments to be completed BEFORE this class	Topics covered
Fri 10/12		University Day No Class	
No Recitation			
Mon 10/15	1	Chapter 1	Intro to Dev Bio
Wed 10/17		No Class-Fall Break	
Fri 10/19		No Class-Fall Break	
RECITATION Week 1 (10/14-10/21): No recitation this week due to Fall Break			
Mon 10/22	2	Chapter 10 Pgs424-429 Movie: Sea Urchin Fertilization Sakai quiz due at 9AM	Fertilization
Wed 10/24	3	Chapter 1, pgs 17-22 Chapter 3, pg 128 Sakai quiz due at 9AM	What genes are <i>expressed</i> in my cell type or tissue of interest?
Fri 10/26	4	Chapter 1, pgs 11-13 Chapter 3 pgs. 132-134 Sakai quiz due at 9AM	What genes are <i>required</i> in my cell type or tissue of interest?
RECITATION Week 2 (10/22-10/26): Where is my gene in the genome and where is it expressed? Chapter 1, 19-20 Prior to recitation must watch: 1. http://www.youtube.com/watch?v=1iRynlXIJw0 2. http://www.jove.com/video/2533/using-whole-mount-situ-hybridization-to-linkmolecular-organismal (video only)			
Mon 10/29	5	Chapter 3, pgs. 135-141 Chapter 8, pgs. 338-343, 348-355 Sakai quiz due at 9AM	Embryonic Stem Cells

Wed 10/31	6	Chapter 3, pgs. 135-141 Sakai quiz due at 9AM	ESC and mouse models: what tissue requires my favorite gene?
Fri 11/2	7	Chapter 1, pgs. 129-132 Chapter 3, pgs. 138, Box 3D Sakai quiz due at 9AM	Cell Fate: where did the descendants of the cell expressing my favorite gene go?
RECITATION Week 3 (10/31-11/4): Design a genetic screen in zebrafish for genes involved in the first cell division.			
Mon 11/5	8	Chapter 1, pgs. 14-27 Chapter 3, 101-110 Chapter 4, pgs. 144-164 Movies: 1. <i>Xenopus</i> Gastrulation 2. <i>Xenopus</i> Gastrulation and Neurulation 3. <i>Xenopus</i> Gastrulation Internal Sakai quiz due at 9AM	<i>Mesoderm Induction and Gastrulation Movements</i>
Wed 11/7	9	Chapter 4, 143-154, 164-169 Sakai quiz due at 9AM	Spemann and Mangold Organizer
Fri 11/9	10	Chapter 4, pg 148 Wnt signaling in development Special Lecture: Dr. Mark Peifer	Wnt signaling in development Special Lecture: Dr. Mark Peifer
RECITATION Week 4 (11/7-11/11): Design and interpretation of experiments to order proteins in a signal transduction cascade.			
Mon 11/12	11	Chapter 4, pgs. 169-174 Sakai quiz due at 9AM	The Ectoderm and Primary Neural Induction
Wed 11/14	12	Chapter 3, 113-127 Chapter 5, pgs. 185-193 Sakai quiz due at 9AM	Mammalian Axis Formation
Fri 11/16	13	Exam 3 Material from Classes	
RECITATION Week 5: No recitation. Exam			

Mon 11/19	14	Chapter 5, pgs. 203-220 Sakai quiz due at 9AM	Segmentation and Identity I
Wed 11/21		Thanksgiving Break	
Fri 11/23		Thanksgiving Break	
RECITATION Week 5 (11/21-11/25): Dr. Lackasegment and somite experiments			
Mon 11/26	15	Chapter 5, pgs. 220-225 Sakai quiz due at 9AM	Segmentation and Identity II
Wed 11/28	16	Chapter 12, pgs 520-533, 539-543 Sakai quiz due at 9AM	Secondary Neural Induction
Fri 11/30	17	Chapter 11, 502-507	Organogenesis
RECITATION Week 6 (11/28-12/2): Pathways of Neural Induction!			
Mon 12/3	18	Chapter 8, pgs. 343-348, 350-355	iPS Cells
Wed 12/5	19		CRSPR
Dec 14th 8:00AM!	20	Exam 4 (Classes 12-20) 8:00AM!	8:00AM!