**Cellular and Developmental Biology (BIOL 205)**  
*Summer Session I 2017*

Dr. Blaire Steinwand and Dr. Andrew Spracklen  
MONDAY, TUESDAY, WEDNESDAY, THURSDAY AND FRIDAY AT 11:30AM in Genome Sciences Building, Room 1374

**Instructor:** Dr. Blaire Steinwand  
blairejs@email.unc.edu

**Office hours:** Wednesday 1pm-2pm and Friday 1pm-2pm in Coker 212  
*I am also available by appointment.*  
*Please contact me if you cannot meet me during the times listed here!*

**Instructor:** Dr. Andrew Spracklen  
asprack@email.unc.edu

**Office hours:** Wednesday 1:30pm-2:30pm and Friday 1:30pm-2:30pm in Fordham 519  
*I am also available by appointment.*  
*Please contact me if you cannot meet me during the times listed here!*

**Graduate Teaching Assistants:** Gina Calabrese (ginamc@live.unc.edu) and Sofia de la Serna (delasern@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, and supplemental material we mention in lecture. I 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:**  

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

**Required reading:** Particular chapters are required (see course outline for “Guided Reading” details) and you will be expected to have read them before class so that you will be able to participate fully in the in-class activities. You may be asked to turn guided reading assignments in on occasion and you may even receive points for completing them. You SHOULD always complete guided reading assignments prior to coming to lecture. You simply will not be able to fully engage in the class without a basic understanding of the material that will be covered.
HOMEWORK QUIZZES ON SAKAI: Homework will be due the morning before almost every class period at 9:00AM. It is your responsibility to start it in a timely fashion, so that you finish it before the deadline. Late homework will receive zero credit, even though you can still do them for practice. DO NOT ASK ME TO MAKE AN EXCEPTION TO THIS RULE. It is YOUR responsibility to finish the homework early so that any late-evening crises do not prevent your finishing on time. Realize that we are trying to help you to succeed by giving you these regular assessments. These assessments will be apart of your participation grade.

POLL EVERYWHERE: As an incentive to come to class and be engaged, part of your grade will come from a program called Poll Everywhere that you use through your laptop or mobile phone. Note - missing just a couple of classes can quickly affect your participation grade! See Sakai for the required registration and troubleshooting and grading policy information.

PIAZZA: There are many 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 course. Unfortunately, as a result, sometimes your e-mails even fall to the bottom of our inboxes and go unanswered. Therefore, in order to address your questions and concerns more efficiently, we will be using an online platform called “Piazza” this course. 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. You will receive a welcome e-mail from your instructor granting you access to the course within the first week of the course and can start using Piazza right away.

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.

WHAT YOU SHOULD BRING TO CLASS EVERY DAY:
1. Outlines from Sakai (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

COURSE GOALS: Many students like to complain that this is a “weed out” course. Of course this is not true, but why does it have this reputation? Fact: the average grade in this class is in the B/C range; C’s are not bad - they are average. If you are wondering if there is a pre-determined number of students that receive a C, D, or F – the answer is no! In theory, if the whole class performs at an A level, then the whole class is given A’s.
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 basic science and its applications!

TESTS: There will be three tests and a final exam given during the session. The format will be multiple choice and open ended. These are not cumulative tests and will only cover the material specified on the course schedule. Test material to study: guided readings, outlines, homework, lecture 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.

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 = (0.22.5 x test) + (0.22.5 x test) + (0.22.5 x test) + (0.22.5 x final exam) + (0.05 x participation score) + (.05 x recitation)

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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.
In general, the scale for each letter grade comes very close to a 10 point scale. However I reserve the right to change that scale since it is impossible to predict the difficulty level of any particular test. I will keep you updated about the estimated scale as the course moves along.

Class Schedule:

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<thead>
<tr>
<th>Date</th>
<th>Lecture #</th>
<th>Assignments to be completed BEFORE this class</th>
<th>Topics covered</th>
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</thead>
<tbody>
<tr>
<td>Wed 5/17</td>
<td>1</td>
<td>Read Chapter 1. Sakai quiz due at 9AM: Introduction to the cell</td>
<td>Introduction to Cell Biology</td>
</tr>
<tr>
<td>Thurs 5/18</td>
<td>2</td>
<td>Read pages 121-155 in Chapter 4 and complete the guided reading assignment. Sakai quiz due at 9AM: Protein structure and function</td>
<td>Protein structure and function</td>
</tr>
<tr>
<td>Fri 5/19</td>
<td>3</td>
<td>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</td>
<td>How we study proteins – Methods and Tools</td>
</tr>
<tr>
<td>Mon 5/22</td>
<td>4</td>
<td>Read pages 359-374 in Chapter 11 and complete the guided reading assignment. Sakai quiz due at 9AM: Membranes Read pages 383-398 in Chapter 12 and complete guided reading assignment. Sakai quiz due at 9AM: Membrane transport</td>
<td>Membrane Structure and function Membrane transport</td>
</tr>
<tr>
<td>Tues 5/23</td>
<td>5</td>
<td>Read pages 487-518 in Chapter 15 and complete guided reading assignment Sakai quiz due at 9AM: Targeting and Trafficking</td>
<td>Targeting and trafficking</td>
</tr>
<tr>
<td>Wed 5/24</td>
<td></td>
<td><strong>Exam 1</strong></td>
<td></td>
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<tr>
<td>Thurs 5/25</td>
<td>6</td>
<td>Review material.</td>
<td>How cells obtain energy</td>
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<tr>
<td>Fri 5/26</td>
<td>7</td>
<td>Read and complete guided reading assignment on Chapter 17 Sakai quiz due at 9AM: Cytoskeleton</td>
<td>Cytoskeleton – Guest Lecturer: Kyle Grode</td>
</tr>
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<td>Mon 5/29</td>
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<td><strong>MEMORIAL DAY HOLIDAY</strong></td>
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<tr>
<td>Tues 5/30</td>
<td>8</td>
<td>Read and complete guided reading assignment on Chapter 16</td>
<td>Cell communication</td>
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</tbody>
</table>
| Wednesday, 5/31 | 9 | Read and complete guided reading assignment on Chapter 16  
Sakai quiz due at 9AM: Cell communication | Cell communication |
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</thead>
<tbody>
<tr>
<td>Thursday, 6/1</td>
<td>EXAM 2</td>
<td>Sakai quiz due at 9AM: Cell communication</td>
<td></td>
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</tbody>
</table>
| Friday, 6/2   | 10 | Read pages 694-701, Fig 20.31, 688-694 in *Alberts*  
**Complete guided reading questions**  
Sakai quiz due at 9AM: Cell Junctions | Cell-Cell & Cell-Matrix Junctions in Development and Disease |
| Monday, 6/5   | 11 | Read section 1.3 (pages 6-8), pp. 54-55 (first section of “Localization of maternal determinants...”), and pages 424-429 in *Wolpert*  
**Complete guided reading questions**  
Sakai quiz due at 9AM: Development Rocks! | Development Rocks from the Start! |
| Tuesday, 6/6  | 12 | Read pages 368-374 + Figure 9.12 and Fig. 3.22, Section 4.8 (pages 158-159), and pages 377-380 in *Wolpert*  
**Complete guided reading questions**  
Sakai quiz due at 9AM: Cleavage/Gastrulation | Cleavage and Gastrulation |
| Wednesday, 6/7| 13 | Read section 3.1 (pages 107-110), Section 4.8 (158-159), Section 9.11 (pages 383-387), section 3.3 (pages 113-114), Fig. 3.15, Section 3.5 (page 119 up to page 121), and Fig 9.33 in *Wolpert*  
**Complete guided reading questions**  
Sakai quiz due at 9AM: Gastrulation I | Gastrulation and Neurulation |
| Thursday, 6/8 | 14 | Read sections 2.11 to 2.12 (pages 51-55 and Cell Biology Box 2B), section 9.9 (pages 380-381), Section 9.14 (page 392 up to page 394) and Medical Box 9E (page 396) in *Wolpert*  
**Complete guided reading questions**  
Sakai quiz due at 9AM: Gastrulation II | Gastrulation and Neurulation II |
| Friday, 6/9   | 15 | Read section 1.13 and Box1E (pages 24-26), section 4.6, 4.9, 4.10, and 4.13 (pages 154-157, 159-161, and 166-167), Box 4B (page 148), and sections 2.25 and 2.26 (pages 79-83) in *Wolpert* and pages 722-723 in *Alberts*  
**Complete guided reading questions** | Induction and Long-Range Signaling |
<table>
<thead>
<tr>
<th>Date</th>
<th>Page(s)</th>
<th>Reading Assignments</th>
<th>Quiz Due At 9AM:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon 6/12</td>
<td>EXAM 3</td>
<td></td>
<td>Induction</td>
</tr>
<tr>
<td>Tues 6/13</td>
<td>16</td>
<td>Read pages 344-345, Sections 8.2 and 8.3 (pages 316-319), Fig. 8.8, section 10.8 (pages 420-423), section 8.5 (pages 322-324), and re-read Figure 2.44 in Wolpert, the PDF Figure about cloning on SAKAI, and pages 276-277 in Alberts</td>
<td>Determination and Differentiation</td>
</tr>
<tr>
<td>Wed 6/14</td>
<td>17</td>
<td>Read sections 2.1, 2.2 (pages 37-40), sections 2.4-2.8 (pages 41-49), sections 2.18-2.19 (pages 66-67), section 2.22 (pages 72-up to page 74), sections 2.29-2.32 (pages 91-94), Cell Biology Box 5D (page 212), and Figs. 12.17 and 12.18 (page 535 and 536) in Wolpert</td>
<td>Patterning the Body Plan: Drosophila</td>
</tr>
<tr>
<td>Thurs 6/15</td>
<td>18</td>
<td>Read pages 236-240, Section 6.7 (pages 248-249), and section 6.8 (pp. 250-252) in Wolpert</td>
<td>A Model for Organogenesis: C. elegans</td>
</tr>
<tr>
<td>Fri 6/16</td>
<td>19</td>
<td>Read pages 135 (bottom)-137, sections 5.10-5.11 (pages 213-219) in Wolpert, PDF from old edition of Gilbert, and Figs. 1.39, 10.35 and 20.41 in Alberts</td>
<td>Making a Mammal: Mouse Development</td>
</tr>
<tr>
<td>Mon 6/19</td>
<td>20</td>
<td>Read pages 712-721, 724 in Alberts</td>
<td>Cancer: An Aberration of Development</td>
</tr>
<tr>
<td>Tues 6/20</td>
<td>READING DAY</td>
<td>Study for exam, good luck!</td>
<td></td>
</tr>
<tr>
<td>Wed 6/21</td>
<td>FINAL EXAM (EXAM 4) 11:30AM-2:30PM</td>
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</table>