

# Honors Cell Biology

Biol 240H, Spring 2024

## Course Description

Welcome! BIOL 240H Cell Biology is an Honors course. This course will take you to the next level of understanding how cells work. You will learn how cell components function, and how cells accomplish dynamic processes including cell division, migration, and communication. These topics are important for development, homeostasis, and avoiding a wide range of human diseases. We consider cell biology interesting because it involves active materials, signal integration, and the struggle to create and maintain order in an increasingly entropic world. The course will also help build your understanding of how scientific knowledge is amassed through creative design of scientific experiments. You will learn to think critically about how discoveries are made, and you will imagine and propose how future discoveries might be made.

## Meeting days, times

T/Th 11:00-12:15pm in GSB1378

## Target audience

This is an honors course and part of the set of 200-level core courses in Biology. The material that we present will mirror to a large extent, though not fully, what is presented in non-honors sections, plus we will use some class periods for hands-on enrichment activities and discussions. Enrichment activity days will replace lecture time, so students will be responsible for learning some material from textbook readings, bringing questions about the readings to the next lecture.

## Modes of Learning

We use some innovative approaches to teaching along with traditional lecture-based teaching, and we seek to connect students' interests to the course material.

## Lectures and Interactive Learning

Lectures will provide some of the fundamental learning necessary to build up a rich understanding of how cells work. Students will participate actively at times, for example by considering problems, pairing up with other students to discuss possible solutions to problems, and sharing the resulting thoughts with the class. Lectures will be supplemented with explanations of the experimental discoveries that have built up our understanding – to contribute to critical thinking and to appreciate creative experimental design – and with explanations of the specific health relevance of many of the topics that we cover.

## Enrichment Activities

We will seek your input on some interactive honors-specific activities that we are planning. These activities are designed to give you experiences related to the course topics, and to give you time to interact informally with the instructors and with each other. One central goal of these activities is to heighten students' curiosity about cell biology, so that learning can be increasingly built from students' own curiosity. We do this because curiosity is a powerful, core motivator for learning. We specifically design enrichment activities in partnership with the students, so that students can take an active part in their own learning through creative and interactive means. In past years, for example, students have built their own

smartphone-based microscopes to use and to keep, contributing to their understanding of microscopy methods, to an intuitive sense of the size scale of cells, and to the proximity of cells to their everyday experiences.

### **Assignments**

Students are assigned readings and the in-class activities detailed above, and you are expected to be active participants in class periods. Grades are determined based on exam results, and we expect that performance on exams will be boosted by active participation in the course.

### **Prerequisites**

Students must have completed Biol 103 (or, from the old Biology curriculum being phased out, Biol 202). Honors Carolina students have priority for registration slots. If spaces are available, other students with at least a 3.0 GPA may register as well.

### **Instructors**

Dr. Bob Goldstein  
Office location: Fordham Hall 616  
Office hours: by appointment  
bobg@unc.edu

Dr. Amy Shaub Maddox  
Office location: Fordham Hall 407  
Office hours: by appointment  
asm@unc.edu

### **General Course Policies**

We want each of you to do well, but for this to happen we need you to do your part. Please take advantage of all of the opportunities to learn and review the material. To facilitate this, attendance at all classes and activities is essential. Anyone who does poorly on any exam is strongly encouraged to meet with the professor at the earliest possible time to plan how to improve performance on the next exam.

Please come to class prepared to ask questions. If you do not understand a point in lecture or in your readings, please feel free to interrupt by asking a question. Do not feel intimidated or embarrassed to ask questions! Note that we would prefer not to answer questions about lecture material by email. This does not mean that we do not want to discuss the material with you, but merely that email is not a good mechanism of doing so. It could take several days of emailing back and forth to answer a question we could address in minutes in a conversation after class. We are happy to stay at the end of class to answer questions. Anyone who wishes to audio record lectures is free to do so.

Please follow Campus Health's COVID recommendations (<https://campushealth.unc.edu/services/primary-care/covid-19-service-details-and-faqs/>) to help keep us all healthy.

### **Course Materials**

Course materials that we provide (exams, lecture slides, lecture outlines, etc) are copyrighted and may not be distributed to third parties including web-based course material collections. You are of course welcome to download copies of the course materials that we provide onto your

own computer. This can be especially valuable to you in the unlikely event that a server goes down before an exam, limiting your access to the course web site. Lecture materials will be uploaded to the course web site (for the first half of the course) or to Sakai (for the second half of the course) before each lecture.

### **Required Text**

Essential Cell Biology, 6th Edition (Bruce Alberts and coauthors, 2023)

### **Student Learning Outcomes**

This course will make you fluent in the following topics, which we consider to be both important – forming a fundamental basis for understanding human diseases, for example – and interesting. The course will also help build your understanding of how scientific knowledge in these areas has been, and continues to be, built up through creative design of scientific experiments. You will learn to think critically about how discoveries are made, and you will gain increased appreciation for creative experimental design.

### **Lecture Topics:**

- Week 1: Introduction to Cell Biology
- Week 2: How to Study Cells
- Week 3: Protein Structure and Function
- Week 4: Membranes and Transport
- Week 5: Mitochondria
- Week 6: Intracellular Compartments and Transport
- Week 7: Cytoskeleton
  
- Week 8: Cell Cycle
- Week 9: Cell Division
- Week 10: Cell Migration
- Week 11: Cell Adhesion
- Week 12: Intercellular Communication
- Week 13: Stem Cells & Cancer
- Week 14: Septins
- Week 15: Bacterial Cells, Fungal Cells, Plant Cells

For the detailed, up-to-date schedule including exam dates, see <http://labs.bio.unc.edu/Goldstein/240HSpring2024/>

### **Course requirements and grades**

Most of your final grade will be determined by your performance on four exams. Exams 1 and 2, given during the first half, bear equal weight (25% each). During the 2nd half of the course, exams (#3 and the Final exam) are worth 20% each. The final 10% of the course grade will be earned by completing guided reading quizzes in Canvas, and by completing an online course assessment for the Biology Curriculum Assessment Committee (~10 tasks total). Each exam will cover only the material indicated on the syllabi. Exam questions will be taken from lectures, activities and assigned readings. Exams must be taken on the dates indicated during the regular class period. Makeup exams will only be given in exceptional circumstances, i.e., medical or family emergency documented in writing. You must notify your professor of such an emergency

before the time of the regular exam. The makeup exam may be in a different format than the in-class exam.

Final course numerical averages will be rounded up or down to integers in the usual way (only 0.5 or above gets rounded up), and then letter grades will be assigned as follows.

A final course average of 93 or above will earn you an A

A final course average of 90 to 92 will earn you a grade no lower than A-

A final course average of 87 to 89 will earn you a grade no lower than B+

A final course average of 83 to 86 will earn you a grade no lower than B

A final course average of 80 to 82 will earn you a grade no lower than B-

A final course average of 77 to 79 will earn you a grade no lower than C+

A final course average of 73 to 76 will earn you a grade no lower than C

A final course average of 70 to 72 will earn you a grade no lower than C-

A final course average of 67 to 69 will earn you a grade no lower than D+

A final course average of 63 to 66 will earn you a grade no lower than D

A final course average of 60 to 62 will earn you a grade no lower than D-

### **Exam dates**

Exam dates are listed on the course web site. The last exam is given in compliance with university final exam policy and is scheduled according to the UNC Final Exam calendar.

### **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.

The professors reserve the right to make changes to the syllabus, including project due dates and test dates. These changes will be announced as early as possible.

### **Advice to you from past students**

- Pay attention
- Pay attention in class, take good notes, and review a little bit each week
- Lectures are key! / Pay attention in lecture / Come to class.
- Take the time to do the reading properly before class.
- Review the lectures after class and complete the exam problems.
- Do not save learning the material until right before the exam, it all builds off prior knowledge and it is helpful to stay on top of it from the beginning
- I would recommend they attend every review session possible.
- Focus on lectures (especially diagrams written on the board)
- Doing the readings is necessary.
- Sometimes the pace of the class is very fast in lecture. Often the topics seem to jump around and this is very difficult when talking about new concepts of which we have no background information. I would recommend recording lectures or reviewing notes after class and writing down all questions you have.
- Read over notes the day preceding the next lecture to reorient yourself in the material each day
- Engage in class, ask questions
- Re-visit the reading and lecture notes the same day to make sure you understand it.

- Get ahead on readings and review lecture material as soon as possible
- Really making sure you understand the material before the test whether that includes group discussions, a practice test, etc.
- Review the lectures a lot.
- Don't be afraid to ask teacher to repeat things that are very unclear from lecture.
- I would recommend them to read textbook and practice lots and lots of problems of applying the concepts.
- Record the lectures so that you can go back through them later and get all of the notes.
- Stay on top of the lectures and readings. It is easy to get information confused so make sure you don't wait until the last minute to try to understand the material
- Record the lecture and take as much meticulous notes as possible; if you miss something in the lecture, you might miss something that is neither specifically stated in the slides and the book.
- Don't save the readings until two days before the test :)
- Ask lots of questions

**Information below applies to all classes at UNC Chapel Hill.**

**University of North Carolina at Chapel Hill  
Information for Undergraduate Classes  
2024**

**Syllabus Changes**

The instructor reserves the right to make changes to the syllabus including project due dates and test dates. These changes will be announced as early as possible.

**Attendance Policy**

**University Policy:** As stated in the University's [Class Attendance Policy](#), no right or privilege exists that permits a student to be absent from any class meetings, except for these University Approved Absences:

Authorized University activities: [University Approved Absence Office \(UAAO\) website](#) provides information and [FAQs for students](#) and [FAQs for faculty](#) related to University Approved Absences

Disability/religious observance/pregnancy, as required by law and approved by [Accessibility Resources and Service](#) and/or the [Equal Opportunity and Compliance Office](#) (EOC)

Significant health condition and/or personal/family emergency as approved by the [Office of the Dean of Students](#), [Gender Violence Service Coordinators](#), and/or the [Equal Opportunity and Compliance Office](#) (EOC).

Instructors may work with students to meet attendance needs that do not fall within University approved absences. For situations when an absence is not University approved (e.g., a job interview, illness/ flu or club activity), instructors are encouraged to work directly with students to determine the best approach to missed classes and make-up assessment and assignments.

**Honor Code**

All students are expected to follow the guidelines of the UNC Honor Code. In particular, students are expected to refrain from "lying, cheating, or stealing" in the academic context. If you are unsure about which actions violate the Honor Code, please see me or consult [studentconduct.unc.edu](http://studentconduct.unc.edu).

### **Acceptable Use Policy**

By attending the University of North Carolina at Chapel Hill, you agree to abide by the University of North Carolina at Chapel Hill policies related to the acceptable use of IT systems and services. The Acceptable Use Policy (AUP) sets the expectation that you will use the University's technology resources responsibly, consistent with the University's mission. In the context of a class, it's quite likely you will participate in online activities that could include personal information about you or your peers, and the AUP addresses your obligations to protect the privacy of class participants. In addition, the AUP addresses matters of others' intellectual property, including copyright. These are only a couple of typical examples, so you should consult the full [Information Technology Acceptable Use Policy](#), which covers topics related to using digital resources, such as privacy, confidentiality, and intellectual property. Additionally, consult the [Safe Computing at UNC](#) website for information about data security policies, updates, and tips on keeping your identity, information, and devices safe.

### **Accessibility Resources and Service**

[Accessibility Resources and Service](#) (ARS – [ars@unc.edu](mailto:ars@unc.edu)) receives requests for accommodations, and through the Student and Applicant Accommodations Policy determines eligibility and identifies reasonable accommodations for students with disabilities and/or chronic medical conditions to mitigate or remove the barriers experienced in accessing University courses, programs and activities.

ARS also offers its Testing Center resources to students and instructors to facilitate the implementation of testing accommodations.

Faculty and instructors with any concerns or questions about accommodations and/or their implementation, are invited to [reach out to ARS](#) to discuss.

### **Counseling and Psychological Services**

UNC-Chapel Hill is strongly committed to addressing the mental health needs of a diverse student body. The [Heels Care Network](#) website is a place to access the many mental health resources at Carolina. CAPS is the primary mental health provider for students, offering timely access to consultation and connection to clinically appropriate services. Go to their website <https://caps.unc.edu/> or visit their facilities on the third floor of the Campus Health building for an initial evaluation to learn more. Students can also call CAPS 24/7 at 919-966-3658 for immediate assistance.

### **Title IX and Related Resources**

Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC at <https://eoc.unc.edu/report-an-incident/> or by contacting the University's Title IX Coordinator (Elizabeth Hall, [titleixcoordinator@unc.edu](mailto:titleixcoordinator@unc.edu)) or the Report and Response Coordinators in the Equal Opportunity and Compliance Office ([reportandresponse@unc.edu](mailto:reportandresponse@unc.edu)). Confidential resources include Counseling and Psychological Services and the Gender Violence Services Coordinators ([gvsc@unc.edu](mailto:gvsc@unc.edu)). Additional resources are available at [safe.unc.edu](http://safe.unc.edu).

### **Policy on Non-Discrimination**

The University is committed to providing an inclusive and welcoming environment for all members of our community and to ensuring that educational and employment decisions are based on individuals' abilities and qualifications. Consistent with this principle and applicable laws, the University's [Policy Statement on Non-Discrimination](#) offers access to its educational

programs and activities as well as employment terms and conditions without respect to race, color, gender, national origin, age, religion, genetic information, disability, veteran's status, sexual orientation, gender identity or gender expression. Such a policy ensures that only relevant factors are considered, and that equitable and consistent standards of conduct and performance are applied.

If you are experiencing harassment or discrimination, you can seek assistance and file a report through the Report and Response Coordinators (email [reportandresponse@unc.edu](mailto:reportandresponse@unc.edu) or see additional contact info at [safe.unc.edu](http://safe.unc.edu)) or the Equal Opportunity and Compliance Office at <https://eoc.unc.edu/report-an-incident/>.

### **Undergraduate Testing Center**

The College of Arts and Sciences provides a secure, proctored environment in which exams can be taken. The center works with instructors to proctor exams for their undergraduate students who are not registered with ARS and who do not need testing accommodations as provided by ARS. In other words, the Center provides a proctored testing environment for students who are unable to take an exam at the normally scheduled time (with pre-arrangement by your instructor). For more information, visit <http://testingcenter.web.unc.edu/>.

### **Learning Center**

Want to get the most out of this course or others this semester? Visit UNC's Learning Center at <http://learningcenter.unc.edu> to make an appointment or register for an event. Their free, popular programs will help you optimize your academic performance. Try academic coaching, peer tutoring, STEM support, ADHD/LD services, workshops and study camps, or review tips and tools available on the website.

### **Writing Center**

For free feedback on any course writing projects, check out UNC's Writing Center. Writing Center coaches can assist with any writing project, including multimedia projects and application essays, at any stage of the writing process. You don't even need a draft to come visit. To schedule a 45-minute appointment, review quick tips, or request written feedback online, visit <http://writingcenter.unc.edu>.