



PCB 3134 Eukaryotic Cell Structure and Function

Fall, 2025

Online (100%), 3 credits

Instructor

Dr. Zhonglin Mou

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Zoom office hours: M, W, F 4:00 – 5:00 PM EST (meeting ID: 949 525 0208 and passcode: MCB6772)

Course Description

Lectures and discussions in the field of cell biology with emphasis on the interrelation of structure and function, the regulation of metabolism and the specialized activities of plant and animal cells.

Course Prerequisites

(BSC 2010 and BSC 2010L or equivalent with minimum grades of C) and ((BSC 2011 and BSC 2011L or equivalent) or (AGR 3303 and CHM 2210) with minimum grades of C) and (CHM 2200 or CHM 2210 with minimum grade of C).

Course Learning Objectives

Upon completion of this course, learners will be able to:

- Identify the structural organization of cells and cell organelles;
- Distinguish the specific function(s) of each organelle;
- Specify the compartmentalization of functions within the cells and organelles;
- Recognize the integration of functions that are compartmentalized within cells;
- Define the regulation of cell functions;
- Describe transmission of genetic information;
- Summarize cell proliferation;
- Explain the experimental approaches to the study of cell structure and functions.

Learning Materials and Supplies

Textbook: Karp's Cell and Molecular Biology: Concepts and Experiments, 9th ed., John Wiley & Sons, Inc., New Jersey, 2016. Author – Janet Iwasa & Wallace Marchall. **(WileyPLUS will provide instructions on how to access the textbook through the UF All Access program, which offers reduced pricing on digital course materials.)**

Students will be responsible for mastering materials covered in the lectures and assigned reading materials from the textbook. The chapters parallel to the lecture materials are listed on the course schedule (see below). It is recommended that you should read the materials assigned from the text prior to watching each lecture video in order to benefit the most from the lectures.

Lecture topics for the course are listed in the course schedule (see below). The topics to be covered will follow the order indicated in the schedule of lecture topics; however, the amount of coverage of specific topics may vary somewhat from the list.

Instructor Interaction Plan

- Expect an instructor response to Canvas email within 24 hours, during weekdays.

- Expect instructor feedback for submitted assignments within one week past the assignment deadline.
- Grades for assessments will be released within 24 hours of deadline.
- If you ever have questions or need clarification on instructor feedback, please email or attend office hours.
- I will post an announcement at least once a week to give updates and class feedback.
- I will monitor and read the discussions. I may post to the entire class, within groups, or email you individually concerning the discussion to give you feedback.
- I invite your feedback in both midterm and end-of-term GatorEvals and plan to continuously improve student experience within the course. Your opinion is highly valued.

Required Technology & How to Obtain the Technology

- Microsoft Office 365 Software is free for UF students: <http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/>.
- A fully functional computer, not a mobile device, with smooth, stable internet connections.
- A $\geq 110^\circ$ field of view USB external camera is required for taking the four Honorlock proctored exams. **Please order the camera as early as possible to ensure you can test it before Test 1** (A used one will be fine as long as it works). Here is an example of the camera (<https://www.amazon.com/Desktop-with110-Degree-Digital-Microphone-Recording/dp/B082CJPNB5>). However, if you have ordered a camera with a 110-degree field of view, it will work, but it should be placed further away (4-6 ft) from the test taker to include the head, computer, keyboard, and hands in the view. The 110-degree camera may need to be located at a distance greater than the length of the desk. *If you have financial difficulty purchasing the camera, please let the instructor know as soon as possible.*

Required Technology Skills

- Using the learning management system
- Using email with attachments
- Creating and submitting files in commonly used word processing program formats
- Downloading and installing software
- Using presentation and graphics programs
- Using apps in digital devices
- Using web conferencing tools (Zoom) and software

Communication Guidelines

- Use **Canvas Email (messaging tool)** for (1) setting a meeting time for office hours, (2) DRC accommodations; (3) emergency situations; or (4) highly sensitive situations.
- Use **Canvas Email (messaging tool)** for questions that are specific to your grades or submissions.
- Use **Course Question Discussion Board**, for general course questions that others may have too.
- A respectful tone is used by all community members in all forms of communication.
- Written communication, both formal and informal, uses the official language of instruction rather than popular online abbreviations and graphic elements such as those sometimes used in social media.
- Video interactions reflect a respectful tone in verbal communications and body language.
- Spelling, punctuation, and grammar are correct.

Technical Support

UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week. <https://helpdesk.ufl.edu/> | 352-392-4357

Course Schedule

Module	Topic	Assessment	Due Dates
M0	Course introduction, WileyPLUS introduction	Syllabus Quiz	8/22/2025
M1	Introduction to the Study of Cell and Molecular Biology (Ch 1) Overview of cell organization Techniques in Cell and Molecular Biology (Ch18)	Perusall reading M1 Quiz M1	8/27/2025
M2	The Chemical Basis of Life (Ch 2) Chemical bonds, water, pH, and buffers Overview of molecular composition of cells	Perusall reading M2 Quiz M2	9/3/2025
M3	Bioenergetics, Enzymes and Metabolism (Ch 3) Thermodynamics, free energy, reaction equilibrium Enzymes - properties, activation energy, mechanisms, kinetics Metabolism - oxidation/reduction, energy transfer, regulation	Perusall reading M3 Quiz M3	9/10/2025
M4.1	The structure and Function of the Plasma Membrane (Ch 4) Overview - understanding membrane structure, membrane composition - lipids Membrane composition - carbohydrates, proteins	Perusall reading M4.1	9/15/2025
	Review for Test 1 via Zoom (9/17/2025)	Practice Test 1	
	First Test (covering M1-M4.1) (Honorlock)*		9/18-21/2025
M4.2	Lipids and membrane fluidity, dynamic nature of plasma membrane, erythrocyte membrane Movement of substances across cell membranes Membrane potentials, nerve impulses	Perusall reading M4.2 Quiz M4	9/24/2025
M5	Aerobic Respiration and the Mitochondrion (Ch 5) Mitochondria structure/function, oxidative metabolism, tricarboxylic acid cycle Oxidation/reduction, electron transport, proton motive force ATP formation, other roles of the proton motive force, peroxisomes	Perusall reading M5 Quiz M5	10/1/2025
	<i>Midterm GatorEval Survey</i>		
M6	Photosynthesis and the Chloroplast (Ch 6) Chloroplast structure/function, overview of photosynthesis, pigments Photosynthetic units, reaction centers, photophosphorylation Carbon dioxide fixation, carbohydrate synthesis	Perusall reading M6 Quiz M6	10/8/2025
M7	Interaction Between Cells and Their Environment (Ch7) Extracellular space, interaction of cells with the extracellular matrix Cell-cell interaction, cell junction, plant cell walls	Perusall reading M7 Quiz M7	10/13/2025
	Review for Test 2 via Zoom (10/15/2025)	Practice Test 2	
	Second Test (covering M4.2-M7) (Honorlock)*		10/16-19/2025
M8	Cytoplasmic Membrane Systems: Structure, Function and Membrane Trafficking (Ch 8) Endomembrane systems, smooth endoplasmic reticulum (SER), rough ER Complete RER, Golgi complex, vesicle transport Lysosomes, proteasomes, plant vacuoles, endocytosis, importing proteins	Perusall reading M8 Quiz M8	10/24/2025
M9	The Cytoskeleton and Cell Motility (Ch 9) The cytoskeleton, microtubules, intermediate filaments Microfilaments, molecular motors, cilia and flagella Muscle contractility, nonmuscle motility	Perusall reading M9 Quiz M9	10/31/2025
M10	The Nature of the Gene and the Genome (Ch 10) Chromosomes, chemical nature of DNA Structure of the genome, stability of the genome	Perusall reading M10 Quiz M10	11/5/2025
	Review for Test 3 via Zoom (11/7/2025)	Practice Test 3	
	Third Test (covering M8-M10) (Honorlock)*		11/8-11/2025
M11	The Central Dogma: DNA to RNA to Protein (Ch 11) Overview of central dogma, ribosomal RNA, 5S RNA Transfer RNA, messenger RNA, genetic code Structure of tRNA, translation - initiation, elongation, termination	Perusall reading M11 Quiz M11	11/14/2025
M12	The Nucleus (Ch 12) The nucleus - nuclear envelop, nuclear pore, nucleocytoplasmic exchange Chromatin/chromosomes, nuclear organization	Perusall reading M12 Quiz M12	11/19/2025

Module	Topic	Assessment	Due Dates
M13	DNA Replication & Cell Division (Ch 13 & 14) Replication is semiconservative, replication in prokaryotes, DNA polymerases, fidelity of replication, replication in eukaryotes Cell cycle, cell cycle regulation, mitosis, cytokinesis, meiosis, recombination	Perusall reading M13 Quiz M13	12/1/2025
	Review for Test 4 via Zoom (11/7/2025)	Practice Test 4	
	<i>Course GatorEval Survey</i>		
	Fourth Test (covering M11-M13) (Honorlock)*		12/4-7/2025
	Make-up Test (Honorlock)*		12/7-10/2025

* The test will be available in the 4 days from **6:00 AM to 11:30 PM EST**.

Grading Policy

In the tests, you will be responsible for materials covered in lectures, Powerpoint notes as well as the assigned readings. Much of the materials covered in lectures will reinforce the materials covered in the text. In addition, there will be materials covered in lectures that is not covered in the text. You will be responsible for the lecture materials whether or not it is covered in the assigned reading. Most test questions will be based on materials covered in lectures, Powerpoint notes, and related materials in the text or materials that are specifically assigned for study and not covered in lectures. A few of the test questions may come from materials in the reading assignments, which are not covered in lectures. Tests will cover the units of materials listed in the Course Schedule.

All four tests will consist of computer-based multiple-choice questions and will have a fixed amount of time and thus must be finished in one sitting. Examples of the type of questions that will be asked can be found in practice tests, which are available through CANVAS. All students must take the tests through **Honorlock** during the periods of test days. Students are responsible to contact **Honorlock** and set up their own test schedules. Exams will be automatically closed at the end of each test period. Each test must be finished in a single sitting. **It is not allowed to take tests in groups.**

All exams will be proctored using **Honorlock**. The use of multiple devices to take exams and attempts to Screen Print or record during exams are strictly forbidden and will be prosecuted as Honor Code violations. Anyone not able to meet the above laptop computer requirements should contact the instructor as soon as possible.

Proctoring standards

A $\geq 110^\circ$ field of view USB external camera is required for taking the four proctored exams. If you take the exam without using the external camera, or the camera position does not meet standards, points will be deducted. In order to gain access to Test 1, you **must** first complete the **External Camera Certification** process. Detailed camera specifications and position requirements can be found at the Canvas course website.

In addition to the four tests, there will be 15 quizzes given during the semester. The quizzes will be online through CANVAS (**NOT requiring Honorlock**). Each quiz will have 6 questions. Although only 6-8 minutes will be needed for each quiz, we will allot 20 minutes to make reasonable accommodation for all students. Each quiz will be based on materials covered in lectures, Powerpoint notes, or assigned reading materials that are covered in the few lectures of each module (M) before the quiz day. The quizzes will remain open in CANVAS for 2 days. Three attempts will be allowed during the 2 days and the best grade will be used. Correct answers to the quiz questions will be released after the 2 days.

Course Grading Structure

Assignment type	Point value	Percent of final Grade
Test 1	35	15%
Test 2	35	15%
Test 3	35	15%
Test 4	35	15%
Quizzes (15)	$15 \times 6 = 90$	10%
Perusall reading assignments (15)	$15 \times 3 = 45$	10%
Question submissions (13)	$13 \times 6 = 78$	20%

Grading Scale

Grade	Percent of total points	Grade	Percent of total points
A	>92 - 100	C	>64 - 69
A-	>86 - 92	C-	>60 - 64
B+	>82 - 86	D+	>55 - 60
B	>79 - 82	D	>51 - 55
B-	>76 - 79	D-	>45 - 51
C+	>69 - 76	E	0 - 45

Attendance & Make-up Work

This online course does not include live lectures. However, a Zoom review session will be held before each test, and students are strongly encouraged to attend for improved test performance. Recordings of these sessions will be posted in Canvas the same day. You are responsible for all course content covered in lecture videos and Powerpoint notes, including any announcements. It is recommended that you read the Powerpoint notes and assigned readings, and watch the lecture videos by the deadlines listed in the course schedule. Staying on track will help you understand the materials and succeed on quizzes and tests.

All quizzes will count toward your final grade. **No make-up quizzes will be offered.**

A make-up test will be available at the end of the semester, allowing you to retake the test with your **lowest** score. For example, if your test scores are: Test 1 – 85, Test 2 – 90, Test 3 – 86, and Test 4 – 97, you may choose to retake Test 1. The make-up test will cover the same materials as the original but will feature different questions.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. [UF Attendance Policies](#)

Academic Honesty

University of Florida students are bound by the Honor Pledge. As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Student Honor Code.” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see [Student Conduct Code Process](#).

Examples of Academic Integrity Violations in This Course

Students are encouraged to discuss course-related materials with each other from the course, help each other understand concepts, study together, and even discuss assessment questions with each other. However, to ensure that you follow the Honor Code and uphold academic integrity, **do not**:

- Have another person complete a quiz or test in this course
- Copy another student's quiz or test answers in this course
- Collaborate with anyone during a quiz or test in this course
- Discuss the questions and answers of a quiz or test with other students while the quiz/test window is still open
- Manipulate and/or distribute any materials provided in this course for any dishonest purpose (including course lecture slides)
- Use any quiz and test materials provided by a previous student taking the course

Student Privacy Disclaimer

Our review sessions may be audio-visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or guest lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person

(or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student

Course Evaluation Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online. Students can complete evaluations in three ways:

1. The email they receive from GatorEvals,
2. Their Canvas course menu under GatorEvals, or
3. The central portal at <https://my-ufl.bluer.com>

Guidance on how to provide constructive feedback is available at <https://gatorevals.ua.ufl.edu/students/>. Students will be notified when the evaluation period opens. Summaries of course evaluation results are available to students at <https://gatorevals.ua.ufl.edu/public-results/>.

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Services for Students with Disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the [Disability Resource Center](#). It is important for students to share their accommodation letter with their instructor and discuss their access needs as early as possible in the semester.

Campus Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

Health and Wellness

- *U Matter, We Care*: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or <https://umatter.ufl.edu/> to refer or report a concern and a team member will reach out to the student in distress.
- *Counseling and Wellness Center*: Visit <https://counseling.ufl.edu/> or call 352-392-1575 for information on crisis services as well as non-crisis services.
- *Student Health Care Center*: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit <https://shcc.ufl.edu/>
- *University Police Department*: Visit <https://police.ufl.edu/> or call 352-392-1111 (or 9-1-1 for emergencies).

- *UF Health Shands Emergency Room / Trauma Center*: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; visit <https://ufhealth.org/locations/uf-health-shands-emergency-room-trauma-center>
- *GatorWell Health Promotion Services*: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit <https://gatorwell.ufsa.ufl.edu/> or call 352-273-4450.

Academic Resources

- *E-learning technical support*: Contact the UF Computing Help Desk at 352-392-4357, <https://it.ufl.edu/helpdesk/> or via e-mail at helpdesk@ufl.edu.
- *Career Connections Center*: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- *Library Support*: Various ways to receive assistance with respect to using the libraries or finding resources.
- *Teaching Center*: 1317 Turlington Hall, 352-392-2010. General study skills and tutoring.
- *Writing Studio*: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- *Student Concern*: [Report Student Concerns or Conduct](#)

Student Complaints:

- Residential Course: <https://www.sfa.ufl.edu/written-student-complaints/>
- Online Course: <https://pfs.tnt.aa.ufl.edu/state-authorization-status/#student-complaint>

Additional Information

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette, and be found in the follow URL:

<http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf>.

Privacy and Accessibility Policies

For information about the privacy policies of the tools used in this course, see the links below:

- Adobe
 - [Adobe Privacy Policy](#)
 - [Adobe Accessibility](#)
- Honorlock
 - [Honorlock Privacy Policy](#)
 - [Honorlock Accessibility](#)
- Instructure (Canvas)
 - [Instructure Privacy Policy](#)
 - [Instructure Accessibility](#)
- Microsoft
 - [Microsoft Privacy Policy](#)
 - [Microsoft Accessibility](#)
- Perusall
 - [Perusal Accessibility](#)
- YouTube (Google)
 - [YouTube \(Google\) Privacy Policy](#)
 - [YouTube \(Google\) Accessibility](#)
- Zoom
 - [Zoom Privacy Policy](#)

- [Zoom Accessibility](#)