

Cell Biology



Bi322

MWF 11-11:50

TYKE 32

Made from astonishingly complex but tiny and diverse self-regulating units, life on Earth is cellular life. Cells make our bodies, hearts and minds, and just as abnormal cell function leads to our ailments, new cellular therapies promise the treatment of disease. To understand life and health, we must look at cells.

This course covers what cells are made of, where they come from and how they interact with each other to form the vast ecosystems we call organisms.

FAQs

How will I be assessed?

Exams	50%
Quizzes	10%
Homework	20%
iClickers	15%
Discussions	5%

What learning materials are available?

Class slides, videos, practice questions and recommended readings from the **TEXTBOOK - ESSENTIAL CELL BIOLOGY**.

Teaching team

Instructor

Prof. Dan Grimes (he/him/his)
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Graduate employees

Carla Campos (she/her/hers)
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Samuel Bertrand (he/him/his)
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Discussions — Wednesday 2pm, 3pm, 4pm in VOL 101

Exams

Exam 1: 45 mins, May 5th @11am

Exam 2: 1hr 50 mins, June 14th @10.15am

Schedule

WEEK 1 What are cells?

MONDAY	No class
WEDNESDAY	Discovering the world of cells
FRIDAY	The diversity of cells
DISCUSSION	Visualizing proteins: antibodies and fluorescence

WEEK 2 What are cells made of?

MONDAY	Cells are powered by molecular machines
WEDNESDAY	Cells are enclosed by membranes
FRIDAY	Cells control what crosses their membranes
DISCUSSION	Investigating protein-protein interactions

WEEK 3 How do cells organize themselves?

MONDAY	Cells send proteins to different locations
WEDNESDAY	Cells modify proteins
FRIDAY	Cells contain an internal network of vesicles
DISCUSSION	Signal sequences: necessary and sufficient

WEEK 4 How do cells take shape?

MONDAY	Cells have skeletons
WEDNESDAY	Cells contain motors
FRIDAY	Cells can move
DISCUSSION	Microtubule branching

WEEK 5 Integrating concepts & exam 1

MONDAY	Integrating concepts & practice questions
WEDNESDAY	Integrating concepts & practice questions
FRIDAY	Exam 1
DISCUSSION	Exam 1 preparation

WEEK 6 How do cells communicate?

MONDAY	Cells send and receive signals
WEDNESDAY	Cells transduce signals
FRIDAY	Cells interpret signals
DISCUSSION	RASopathies and optogenetics

WEEK 7 Where do cells come from?

MONDAY	Cells divide
WEDNESDAY	Cells control when they divide
FRIDAY	Cells can turn cancerous
DISCUSSION	Cell sorting and yeast mutants

WEEK 8 How do cells make tissues?

MONDAY	Cells adhere to each other
WEDNESDAY	Cells secrete matrix
FRIDAY	Cells replenish and renew
DISCUSSION	Gut stem cells

WEEK 9 Why do cells die & how do cells live forever?

MONDAY	No class
WEDNESDAY	Cells die
FRIDAY	Cells make organisms
DISCUSSION	C. elegans and lineage tracing

WEEK 10 Integrating concepts

MONDAY	The future of cell biology
WEDNESDAY	Integrating concepts & practice questions
FRIDAY	Integrating concepts & practice questions
DISCUSSION	Exam 2 preparation

Course structure

CLASSES — Classes are MWF from 11-11:50am. Attendance is mandatory. Since most classes begin with iClicker questions, you should arrive on time. I will use a mixture of slides and white board. Bring note-taking materials. I will post any slides on Canvas shortly before the class. iClicker questions and answers will be posted after class.

DISCUSSIONS — Discussion sections are Wednesday afternoons and are led by Graduate Employees. Attendance is mandatory and participation is tracked. Some new concepts will be introduced, some concepts from classes will be recapped, and lots of practice questions will be given. Bring note-taking materials and a calculator.

OTHER LEARNING MATERIALS — You will often be directed to other materials (sections from the textbook, videos etc.) that are an essential part of the course. Some of these materials will help reinforce key concepts by going over class material in a different way. Sometimes, important new information will be introduced this way; not everything will be directly covered during classes.

QUIZZES — Most weeks, there will be quiz posted on Canvas on Friday. You will have until the following Wednesday to complete the quiz. You can take the quiz as many times as you like and only your highest grade will be counted. We suggest first attempting the quiz without reference to notes to help you gauge your understanding of the material. If you get any questions wrong, you should then look up answers and re-read notes/the textbook on that topic before trying the quiz again.

HOMEWORK — Most weeks, there will be homework posted on Canvas on Wednesday. You will have until the following Wednesday to complete the homework, which should be handed in during the Discussion section or emailed to your GE. It is essential to carefully work through homework problems, as they are critical for your understanding of the material and also provide important practice for the exams. You may work in groups if you wish, but the final work you hand in should be your own. GEs will grade the homework and return it in Discussions the following Wednesday. Note that some homework questions will be challenging but the act of thinking through them is useful even if arriving at the correct answer is difficult. We will grade homework based on level of effort rather than correctness.

EXAMS — Exam 1 (worth 20% of your grade) and exam 2 (30%) are scheduled: Exam 1 on Friday 5th May at 11am and Exam 2 on Wednesday 14th June at 10.15am. These will assess your understanding of the course material and will be taken in-person without notes. Make sure you are available as it is very rare that we can reschedule exams.

Important notes

CONTACTING THE TEACHING TEAM — If you want to contact Dan, Carla or Sam, please email them. In the subject line of your email, include: "Bi322: (your subject)". We will try to respond quickly but can't always guarantee it.

CHALLENGING TOPICS — Aspects of this course include topics which may be controversial or triggering such as human developmental disease, cancer and stem cells. We must approach these topics with sensitivity and appreciate that discussing them may be emotionally taxing for ourselves and others.

CLASSROOM ETIQUETTE — Please arrive on time. Classes and Discussions begin promptly on the hour. Please do not leave early, as this is disruptive to everyone. Be respectful of your colleagues. Please avoid doing things that aren't related to the class during classes and discussions.

MISSING ASSIGNMENTS — Quizzes are open for 6 days and you have 1 week to complete homework; as such, unless there are exceptional circumstances, we do not grade any late assignments. However, your two lowest quiz and homework grades will be dropped when calculating your final score on the course.