Course Syllabus

INSTRUCTOR CONTACT INFORMATION

Instructor: Dr. Collin Thomas

Lecture Hall: KWG100

Office: ABL101B

Email: collin.thomas@rice.edu

Office Hours: By appointment (in person or on Zoom, your preference)

REQUIRED READING

1. Campbell Biology, any edition of the biology (majors version) from 6thediton through current edition (12th)
2. Lives of a Cell: Notes of a Biology Watcher by Lewis Thomas
3. Ephemera Papers (Provided on Canvas)

COURSE OBJECTIVES

Intangible Objectives

Knowing about things is intrinsically satisfying so learning more about how things work is itself worthwhile (based on this simple pleasure principle). Biology is particularly meaningful to us since we find ourselves on a planet that is hopelessly infested with life. Of late, we are increasingly thinking about biology in the most grandiose terms— defeating an entrenched pandemic virus, plumbing whole genomes and editing them, cloning organisms, wringing our hands over the whole scale loss of biomes due to human action or lack thereof. While there is no denying the importance of biology to the perceived interests of humans, my own hope for you is that biology becomes a liberating science—a collection of ideas and insights that will predispose you toward logical skepticism of given truth and lend itself to your own use of its methods. It is at root a mirthful and optimistic pursuit of a deeper understanding of the living world which can enliven your thinking and feed your curiosity.

Tangible Objectives

You will learn to think about biology through the interpretation of data. You will become familiar with ideas, important questions, and great experiments that underpin modern cell biology, genetics, biochemistry, and molecular biology. You should be able to interrogate biological questions through the lenses of these disciplines. You will learn how to approach the scientific literature in open-ended peer discussions of the cell and molecular canon. Your writing and scientific communication skills will be informed by selected historic journal articles— all of which have influenced the thinking of generations of biologists.

COURSE EXPECTATIONS

Attend all the lectures. Read all material for the class meeting as indicated in the syllabus. Your reading encompasses separate assignments for each lecture: a text chapter from Campbell, an essay by Lewis Thomas from his anthology Lives of a Cell, and an ephemeron. You will have an opportunity to discuss ephemera in recitation or with me outside of class, and you are always welcome in office hours. Outline the text chapters and become conversant in the vocabulary as we learn. More importantly, ask yourself questions, ask your mates questions, and ask me questions in office hours or in class. If there is a particular topic that you find vexing or interesting, let me know, and I will supply you with additional resources.

RECITATIONS

There are four teaching assistants for our class who will each hold a 2 h recitation each week. In first hour of recitation, you will have a chance to talk about ephemera readings, and in the second hour you may ask questions about lecture or text reading for the class. While you are not obliged to go, you are encouraged to attend one evening recitation session each week. The TAs will discuss the articles using potential exam questions I will provide them. Get to know your TAs—they are great people and will be a valuable resource to you. Recitations will start on Zoom beginning the week of January 17 and will migrate to our lecture hall the week of Jan 24.

Teaching Assistants

Name	**Contact**	**Day and Time**	**Location**
Annelise Goldman	alg18@rice.edu	Monday 7pm-9pm	Zoom or KWG100

Ken Nguyen	kn16@rice.edu	Thursday 7pm-9pm	Zoom or KWG100
Alexis Ellerbe	age4@rice.edu	Tuesday 7pm-9pm	Zoom or KWG100
Abrar Mamun	afm9@rice.edu	Wednesday 7pm-9pm	Zoom or KWG100

App for recitations: : **(https://www.socrative.com/apps/) https://www.socrative.com/apps/ (https://www.socrative.com/apps/) (https://www.socrative.com/apps/)**

GRADED WORK

Exams

You will have 3 take-home exams and a final exam, each scored on a percent basis. I will drop your lowest exam grade (inclusive of the final) at the end of the term. Each exam, less the dropped one, will count toward 25% of your reported grade. You will have roughly 3 days to think about and finish each take-home exam which is to be completed by you alone, but you may use your notes and book as resources. Exams will be released through Canvas on a Monday morning and are to be uploaded before midnight that Wednesday. I will not accept email or late exams, nor will I permit makeup exams or extensions. The dropped exam serves as grace for unexpected absences or extenuating circumstances.

Homework

You will have a quiz each week on Canvas, to be completed by midnight on Friday. These quizzes are open notes, open book, open conversation. Your quiz average will count 25% of your final grade.

EXAM	CANVAS RELEASE DATE	DUE IN CANVAS
One	Monday, Feb. 21, 2022	Wednesday, Feb. 23, 2
Two	Monday, Mar. 21, 2022	Wednesday, March 23,
Three	Monday, April 18, 2022	Wednesday, April 20, 2
FINAL	TBD	TBD

RICE HONOR CODE

In this course, all students will be held to the standards of the Rice Honor Code, a code that you pledged to honor when you matriculated at this institution. If you are unfamiliar with the details of this code and how it is administered, you should consult the Honor System Handbook at http://honor.rice.edu/honor-systemhandbook/. This handbook outlines the University's expectations for the integrity of your academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process.

DISABILITY SUPPORT SERVICES

If you have a documented disability or other condition that may affect academic performance you should: 1) make sure all associated documentation is on file with Disability Support Services (Allen Center, Room 111 / 3 adarice@rice.edu / x5841) to determine the accommodations you need; and 2) talk with me to discuss your accommodation needs.

LECTURE SYLLABUS

			Reading and Preparation	
Class	Date	Topic	Lives of A Cell Chapter	Ephemera (“Files” on Canvas)
1	M 10 Jan	Why study biology?		What is Life Chap. 1 on
2	W 12 Jan	Atomizing biology		
3	F 14 Jan	Pauling’s revolution		
4	W 19 Jan	Electronegativity		Miller paper
5	F 21 Jan	Weak interactions/Water		
6	M 24 Jan	Water: thermal		

6	M 24 Jan	environment		
7	W 26 Jan	Solvation		
8	F 28 Jan	Reactions		
9	M 31 Jan	Water equilibrium/Buffers	The Lives of a Cell	
10	W 2 Feb	Carbon Chemistry	Thoughts for a Countdown	
11	F 4 Feb	Carbon Chemistry	On Societies as Organisms	
12	M 7 Feb	Sugars	A Fear of Pheromones	Anfinsen paper
13	W 9 Feb	Proteins	The Music of *This* Sphere	
14	M 14 Feb	Protein Folding		
15	W 16 Feb	Lipids	An Earnest Proposal	
16	F 18 Feb	Nucleic Acids		
17	M 21 Feb	Cytoskeleton & Nucleus	The Technology of Medicine	Watson & Crick paper
18	W 23 Feb	Endomembrane System	Vibes	
19	F 25 Feb	Endomembrane System	Ceti	
20	M 28 Feb	Symbiont organelles	The Long Habit	Gray paper, Sagan paper(optional)
21	W 2 Mar	Plasma membrane	Antaeus in Manhattan	
22	F 4 Mar	Membrane Transport	The MBL	
23	M 7 Mar	Membrane Transport	Autonomy	Ediden
24	W 9 Mar	Bioenergetics: thermo		

25	F 11 Mar	Bioenergetics: kinetics	Organelles as Organisms	Sumner paper
26	M 21 Mar	Enzymes	Germs	
27	W 23 Mar	Enzyme Control	Your Very Good Health	
28	F 25 Mar	Redox and Glycolysis	Social Talk	
29	M 28 Mar	Respiration	Information	Swan paper
30	W 30 Mar	Photosynthesis	Death in the Open	
31	F 1 Apr	Signal Transduction	Natural Science	
32	M 4 Apr	Signal Transduction	Natural Man	Wilson paper
33	W 6 Apr	Cell cycle control	The Iks	
34	F 8 Apr	Sex	Computers	
35	M 11 Apr	Transmission genetics	The Planning of Science	Orgel and Crick paper
36	W 13 Apr	Transmission genetics	Some Biomythology	
37	F 15 Apr	DNA replication	On Various Worlds	
38	M 18 Apr	Transcription	Living Language	
39	W 20 Apr	Translation	On Probability and Possibility	
40	F 22 Apr	Translation	The World’s Biggest Membrane	
TBD	27 Apr-3 May	FINALS		