

## BIOL S105 - Introductory Information

### Information below is tentative for Yale Summer Session A during the Summer of 2024.

**Note: BIOL S105 is co-taught and divided into two parts. Each will count toward 50% of your grade.**

Part I, (105A) will be taught by Dr. Thomas Loreng and corresponds with the course BIOL 101 that is held during the fall and spring semesters.

Part II (105B) will be taught by Dr. Amaleah Hartman and corresponds with the course BIOL 102 that is held during the fall and spring semesters.

**Please read the entire syllabus. This syllabus is a general guide, and subject to change if necessary.**

### General Class Structure

BIOL S105 will have live lectures Monday-Friday 10:30-12:15 EST from May 27<sup>th</sup> - June 28<sup>th</sup> 2024. Students are expected to attend in-person in **OML 202**. During the scheduled class time, students will be participating in group activities, answering, and asking questions, and presenting live.

JUNE 2024						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27 First Day of S105A Lecture 1: Introduction	28 Lecture 2: Proteins	29 HW 1 Due 9 AM Lecture 3: Protein Folding and Functions	30 Quiz 1: Lect. 1-3 Lecture 4: Carbs, Lipids, Membranes, and Thermodynamics	31 Lecture 5: Enzymes	1
2	3 HW 2 Due 9 AM Lecture 6: Metabolism and Photosynthesis	4 Quiz 2: Lect. 4-6 Lecture 7: DNA Structure and Replication	5 Lecture 8: Transcription and Translation	6 Lecture 9: Gene Regulation and Gene Technology	7 WATCH ONLINE Lecture 10: Genomics and other "Omics"	8
9 HW 3 Due Noon	10 Quiz 3: Lect. 7-9 Lecture 11: SARS-CoV-2 and Viruses	11 In Class Cumulative Exam Last Day of S105A	12 First Day of S105B Lecture 1: Cell Tour & Tools to Study Cells I	13 Lecture 2: Cell Tour & Tools to Study Cells II	14 Lecture 3: Plasma Membrane & Transport I	15
16 HW 1 Due Noon	17 Lecture 4: Plasma Membrane & Transport II	18 Online Quiz 1: Lect. 1-4 Due 9 AM Lecture 5: Intracellular Membranes & Sorting/Traffic I	19 Lecture 6: Intracellular Membranes & Sorting/Traffic II	20 Lecture 7: Intracellular Membranes & Sorting/Traffic III	21 HW 2 Due 9 AM Lecture 8: Cell Signaling	22
23 Online Quiz 2: Lect. 5-8 Due Noon	24 Lecture 9: The Mitochondrion and Chloroplast	25 Lecture 10: The Cytoskeleton I	26 HW 3 Due 9 AM Lecture 10: The Cytoskeleton II	27 Lecture 12: The Nucleus & The Cell Cycle	28 In Class Cumulative Exam Last Day of S105B	29

## Academic Integrity

**Students are expected to read and understand “Appendix A” as outlined in the Yale Summer Session Handbook.** A student violating the terms outline Appendix A of the Yale summer session handbook in any assignment, test, or examination in this class will receive a minimum penalty of a zero (0) for that exam, quiz or assignment, and may receive a grade of "F" for the course at the discretion of the instructors.

## Part I - Biochemistry and Biophysics - BIOL S105A

**Dr. Thomas Loreng** - [thomas.loreng@yale.edu](mailto:thomas.loreng@yale.edu)

**Office Hours:** I tend to hang out after the lecture for a bit. Otherwise, schedule some time by emailing me!

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**GOALS:** BIOL S105A will introduce the common macromolecules of life and their function. In short, we will investigate life at the molecular level. Experimental methods and rationales will be introduced. Students will be asked to interpret data and understand related research and its impact on society.

**TEXTS:** Life: The Science of Biology, 12th edition, By Sadava et al. Sinauer/ WH Freeman, publishers. The eBook of the 11<sup>th</sup> edition or 10<sup>th</sup> editions are acceptable, and I will list readings for all versions. All relevant lecture slides will be posted to Canvas before the lecture, and all additional assigned readings can be downloaded via the course website. **THE TEXTBOOK IS SUPPLEMENTAL ONLY. I do recommend it, but it is not necessary to succeed in the course. Nothing in the textbook will be tested on if it is not in one of my lectures.**

### ASSESSMENT:

#### For BIOL S105A ONLY (50% of overall grade in BIOL S105):

- **Weekly Quizzes:** Three lecture periods will begin with a quiz (administered on paper) focused on material presented during the previous lectures. No information in the assigned readings that is not discussed in lectures will be on the quizzes or exam. You are responsible for information in lectures only. The quizzes make up **25%** of your grade.
- **Homework:** Will be posted on Canvas during the week, submit your work via Canvas on the due date **before** the due time. The homework assignments make up **30%** of your grade. You may discuss the assigned exercises with classmates but must compose and write the answers independently.
- **Final Exam:** Administered on paper during normal class hours on June 11<sup>th</sup> and will count for **35%** of your grade. This exam is cumulative.
- **Participation:** You will receive a score worth **10%** of your grade for participation in exercises and activities done in class, so come prepared and participate. All readings will be posted on Canvas (see below). This grade includes attendance. **ATTENDANCE IN BIOL S105A IS MANDATORY.** A student who is absent without prior authorization (through email) will receive 0 participation points for the day.

### Keeping Yourself Organized:

The Pages tab on Canvas will contain a To Do List for each week the course. It will list the required and supplemental readings. By reading these materials **before** lecture, you can better prepare yourself for the content of said lecture. The To Do List will also contain due date reminders and links to any outside sources that may help in your learning.

## Part II - Cell Biology - BIOL S105B

Amaleah Hartman, Ph.D. (she/her) - [amaleah.hartman@yale.edu](mailto:amaleah.hartman@yale.edu)

**Office Hours:** TBD

**Required Text:** No textbook required. Assigned readings will be uploaded to Canvas.

### Course Description

Understand cell biology from a molecular perspective. Learn how to study cells, and investigate current knowledge of cell membranes, organelles, cytoskeletons, cell growth and division, cell communication, and the mechanism underlying cellular events. To cultivate your familiarity of the science behind what we know, we will discuss specific experimental techniques utilized to study cell biology.

The lectures are designed to be interactive. In addition to instructor presentations, we will often break into small groups to discuss problems and analyze data.

We will discuss experimental techniques important to the study of cell biology, how to read and interpret primary research articles, and how to construct precise and concise scientific writing.

### Expected Learning Outcomes

Students from this class will:

1. be able to identify the basic structures of a eukaryotic cell and understand how these structures relate to cellular function in diverse cell types.
2. understand the storage, flow, and regulation of genetic information in cells, in the contexts of cell function and inheritance.
3. understand how molecules move around the cell and across membranes.
4. be able to draw and explain key aspects of the cell cycle and how they are regulated.
5. understand how cells interact with their environment and communicate with each other.
6. be able to analyze data relating to gene expression, cellular function and proliferation, and synthesize hypotheses regarding the regulation of fundamental cellular processes.
7. understand tools, techniques, hypotheses and experiments that were used to generate our understanding of some of the key aspects of cell biology.
8. understand the consequences of cell biology as they relate to human disease.

### Methods of Assessment

- Lecture activities (10%)
- 4 Problem sets, designed to prepare you for the quiz the next day (30%)
- 3 In-class quizzes, each over the previous three lectures (20%)
- 2 Journal-club style small group participation (10%)
- 1 Final exam (30%)

## Prerequisites

None

## Inclusion and Accessibility

In BIOL S105, we strive to be an inclusive community to all, and work to provide an enriching learning environment regardless of level of preparation, race, ethnicity, religion, gender, or sexual orientation. We aim to create an environment that promotes discussion, inquiry and diligence in understanding and respecting other viewpoints.

If you have a disability-related need for academic accommodations, please let us know as soon as possible even if you have not yet completed registration with the Student Accessibility Services. We will make every attempt to accommodate your disability-related needs.