

## BIOL S105 01 (SA22): Biochemistry, Biophysics, and Cell Biology

### BIOL 105 - Introductory Information

**Note: BIOL S105 is co-taught and divided into two parts. Each will count as 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 30<sup>th</sup> - July 1<sup>st</sup> 2022. Students are expected to attend in-person in **TBD**. During the scheduled class time, students will be participating in group activities, answering and asking questions, and presenting live.

JUNE 2022						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29	30 Introduction	31 Proteins	1 HW 1 Due 9 AM Protein Folding and Functions	2 Carbs, Lipids, Membranes, and Thermodynamics Quiz 1, Lect. 1-3	3 Enzymes	4
5	6 HW 2 Due 9 AM Metabolism and Photosynthesis	7 DNA Structure and Replication Quiz 2, Lect. 4-5	8 Transcription and Translation	9 Gene Regulation and Gene Technology	10 Genomics and other "Omics" Quiz 3, Lect. 6-8	11
12 HW 3 Due Noon	13 Special Topic: SARS-CoV-2 and Viruses	14 In Class Cumulative Exam Last Day of S015A	15 Start S105B Lecture 1	16 Lecture 2	17 Lecture 3 PSET 1 Due @ 11:59 PM	18
19	20 Lecture 4 Quiz 1: Lect. 1-3	21 Lecture 5 Journal Club 1	22 Lecture 6 PSET 2 Due @ 7 PM	23 Lecture 7 Quiz 2: Lect. 4-6	24 Lecture 8	25
26	27 Lecture 9 PSET 3 Due @ 7 PM	28 Lecture 10 Quiz 3: Lect. 7-9 Journal Club 2	29 Lecture 11	30 Lecture 12 PSET 4 Due @ 7 PM	1 Final Exam: Lect. 1-12	2

## 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 105A

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

Office Hours: By Appointment

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**GOALS:** Bio 105A 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, 11th 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.

### ASSESSMENT:

**For Bio 105A ONLY (50% of overall grade in BIOL S105):**

- **Weekly Quizzes:** Three lecture periods will end with a quiz (administered on Canvas) 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.
- **Midterm Exam:** Administered online during normal class hours on June 14<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).

### Keeping Yourself Organized:

The Modules tab on Canvas will list a To Do List for 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 105B

### Instructor:

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 (20%)

3 In-class quizzes, each over the previous three lectures (10%)

2 Journal-club style small group participation (10%)

1 Final exam (30%)