

2026 Summer Introduction to Biology Syllabus

HelixEd

Course Overview

This course serves as a rigorous survey of the foundational topics covered in a competitive high-school level biology curriculum. While adapted for late middle school and early high school students with no explicit prior knowledge assumed, the core conceptual depth closely aligns with the AP Biology framework. Students will bridge the gap from middle school general science to high-school level macro- and micro-biological systems, preparing them to excel in advanced honors tracks.

The instructor of this course will be **Antony Wang**.

Antony Wang graduated from Basis Independent School Silicon Valley and is a rising sophomore at **Georgetown University**, majoring in Biology. He has completed AP Biology and AP Chemistry, earned recognition as USABO Semifinalists, and served as co-presidents of their school's Biology Club.

Course Expectations

Classes will be held online on zoom. Students are expected to attend every class (on time), or communicate with instructors if they have conflicts, and to maintain typical etiquette and conduct in class (including having their cameras on).

Students are also expected to join the Canvas or Google classroom (will be provided 2 days before class starts) to complete homework assignments as well as contacting the instructors.

After every class, homework will be uploaded to the Canvas. Homework will consist of 10 questions, generally distributed into 4 “easy” questions, requiring obvious application of class material, 4 “medium” questions, requiring a less straightforward application, and 2 “difficult” questions that challenge the student’s understanding. It is expected that

students will regularly solve the first 8 questions mostly successfully, and make an honest effort on the last 2. Students who find difficulty with the problems are encouraged to approach the instructors for help. Consistent engagement, including completing the problem sets, is important for success in this course.

Textbook (not required): Campbell Biology 10th edition or higher

Course Topics

This course will be taught over a series of **15 classes (1.5 hour each)**, which will be on the following topics:

Day 1	Chemistry I	○ The Chemical Context of Life
Day 2	Chemistry II	○ Water and Life ○ Carbon and the Molecular Diversity of Life
Day 3	Chemistry III	○ The Structure and Function of Large Biological Molecules
Day 4	Cell I	○ A Tour of the Cell
Day 5	Cell II	○ Membrane Structure and Function
Day 6	Cell III	○ An Introduction to Metabolism ○ Cellular Respiration and Fermentation
Day 7	Cell IV	○ Photosynthesis ○ Cell Communication
Day 8	Genetics I	○ The Cell Cycle ○ Meiosis and Sexual Life Cycles
Day 9	Genetics II	○ Mendel and the Gene Idea ○ The Chromosomal Basis of Inheritance
Day 10	Genetics III	● The Molecular Basis of Inheritance ● Gene Expression: From Gene to Protein
Day 11	Genetics IV	● Regulation of Gene Expression ● Viruses

		• DNA Tools and Biotechnology
Day 12	Evolution I	• Genomes and Their Evolution • Descent with Modification: A Darwinian View of Life
Day 13	Evolution II	• The Evolution of Populations • The Origin of Species
Day 14	Ecology I	• An Introduction to Ecology and the Biosphere • Population Ecology
Day 15	Ecology II	• Community Ecology • Ecosystems and Restoration Ecology • Conservation Biology and Global Change

Day 1: Chemical Context of Life, Water & Life, Carbon & Molecular Diversity of Life

Day 2: Macromolecules & Tour of the Cell