

Kenneth P. Dietrich School of Arts and Sciences
College in High School

2023-2024
Preparation for Biology
BIOSC 0100--3 Credits

Description: The goal of this course is to provide students with a foundation in biology. This course focuses on a subset of major topics covered in the University of Pittsburgh courses Foundations of Biology I and II (BIOSCI 0150, 0160), including a review of chemistry as it applies to biology, the structure and function of macromolecules, the basic structure of cells, energy and cellular respiration, introduction to genetics and molecular biology, and development. While these topics are covered in high school biology courses, Preparation for Biology delves deeper and applies chemistry concepts to achieve a more complete understanding of biology. This, combined with practicing critical thinking skills, and primary literature and data analyses, prepares students for the rigors of the Foundations of Biology series.

Prerequisite: High School biology is the required prerequisite for the course.

Grading: The final grade will be determined on the basis of total points earned during the course. There will be two exams, each 50 points. There will be a cumulative (comprehensive) final exam (75 points). Additionally, there are 75 points that the teacher may assign at their discretion (for example, 3 10-point quizzes and 45 points in homework are recommended, but not required) for a total of 250 points for the course.

Textbook: The recommended text for the course is Sadava, *Life: The Science of Biology, 11th Edition*; published by McMillan (do not need to activate Launchpad). Other textbooks will be considered by the faculty liaison on a case-by-case basis.

Laboratory: Laboratory exercises are incorporated as part of the course to practice experimental design and critical thinking skills. One lab will be conducted as a day-long experience at the University of Pittsburgh. All other labs can be conducted at the school. No lab setup is needed by the school: equipment and reagents are all provided by the University.

The following topics are covered in the University of Pittsburgh BIOSC 0100 course:

1. The Chemistry of Life

- Chemical Bonds
- Water
- Carbon/Functional Groups

2. Macromolecules

- Proteins
- Enzymes
- Carbohydrates

- Lipids
- Nucleic Acids

3. The Cell

- Organelles
- Cytoskeleton
- Membranes
- Cell/Cell Interactions
- Signal Transduction

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EXAM 1 (1 hour)

4. Energy

- Glycolysis
- Cellular Respiration

5. The Cell Cycle

- Mitosis
- The biology of cancer
- Meiosis
- Non-Disjunction-Human Genetic Disease

EXAM 2 (1 hour)

6. Genetics

- Mendelian Genetics

- Chromosome Theory of Inheritance

7. The Central Dogma of Molecular Biology

- DNA Replication
- Anatomy of a Gene
- Transcription/Post-transcriptional modifications
- Translation

8. Development

- Control of Eukaryotic Gene Expression
- Differential Gene expression during development

Final EXAM (2 hours)

Additional course credit information for BIOSC 0100:

At the University of Pittsburgh, course credits can count in three ways: toward the requirements for a major, toward elective requirements, and/or toward the total number of credits needed to graduate. For this course:

- **Majors:** As BIOSC 0010 is a preparatory course, it does not fulfill major requirements, although it provides preparation for the courses needed for life science majors related to biology
- **Electives:** Individual Schools and Colleges of the University (such as Engineering, Arts & Sciences, Business, Information Sciences, and so on) have different policies about elective credits and may count this course as an elective. Students interested in studying at the University of Pittsburgh should contact their School/College of interest to see if this course would be counted
- **Graduation:** This course's credits count toward the number of credits needed for graduation

Academic Integrity: All College in High School teachers, students, and their parents/guardians are required to review and be familiar with the University of Pittsburgh's Academic Integrity Policy located online at <https://www.as.pitt.edu/faculty/policies-and-procedures/academic-integrity-code>.

Grades: Grade criteria in the high school course may differ slightly from University of Pittsburgh standards. A CHS student could receive two course grades: one for high school and one for the University transcript. In most cases the grades are the same. These grading standards are explained at the beginning of each course.

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Transfer Credit: University of Pittsburgh grades earned in CHS courses appear on an official University of Pittsburgh transcript, and the course credits are likely to be eligible for transfer to other colleges and universities. Students are encouraged to contact potential colleges and universities in advance to ensure their CHS credits would be accepted. If students decide to attend any University of Pittsburgh campuses, the University of Pittsburgh grade earned in the course will count toward the student grade point average at the University. At the University of Pittsburgh, the CHS course supersedes any equivalent AP credit.

Drops and Withdrawals: Students should monitor progress in a course. CHS teacher can obtain a Course Drop/Withdrawal Request form from the CHS office or Aspire. The form must be completed by the student, teacher and parent/guardian and returned to teacher by deadlines listed. Dropping and withdrawing from the CHS course has no effect on enrollment in the high school credits for the course.