straighterline

Syllabus

BIO101L | **Introduction to Biology Lab**

Course Text

Custom Lab Kit–Sold Separately

This course requires lab kit SI-11036-BK-01 from Science Interactive for $103 (plus shipping).

Course Description

This lab-only course is designed as a standalone addition to the Introduction to Biology course. Students will complete at home laboratory experiments, track and record results and take lab-based assessments to meet the lab requirement. The labs are provided by Science Interactive, a leading provider of at home lab kits and supplemental online materials. This course will give the student a solid foundation for further study into laboratory sciences.

Learning Outcomes

After completing this course, students will be able to:

1. Apply the steps of the scientific method to design and interpret biological experiments.
2. Explain the structure and function of DNA and RNA and describe the processes of transcription and translation.
3. Describe mechanisms of genetic inheritance using Mendelian principles and quantitative tools.
4. Compare prokaryotic and eukaryotic cells and describe the structure and function of key organelles.
5. Describe the processes involved in mitosis and the stages of the cell cycle.
6. Explain the stages of photosynthesis and the roles of chloroplast structures and pigments.
7. Analyze ecological succession and the factors that influence community development.
8. Evaluate mechanisms of evolution and calculate allele frequencies using the Hardy-Weinberg equation.

Course Prerequisites

There are no prerequisites to take Introduction to Biology Lab, though we highly recommend previous or concurrent enrollment in Introduction to Biology (BIO101).

Academic Integrity Statement

Academic integrity is the pursuit of scholarly activity in an honest, truthful and responsible manner. Violations of academic integrity include, but are not limited to, plagiarism, cheating, fabrication and academic misconduct. Failure to comply with the Academic Integrity Policy can result in a failure and/or zero on the attempted assignment/examination, a removal from the course, disqualification to enroll in future courses, and/or revocation of an academic transcript.

Course Completion Policy

In order for a course to be considered complete, **all required coursework must be attempted, submitted, and graded.** Required coursework consists of graded assignments. Any Academic Integrity Policy violations may prevent a course from being considered complete.

Assessment Types

StraighterLine courses may include any combination of the assessment types described below. Review the descriptions to learn about each type, then review the Course Evaluation Criteria to understand how your learning will be measured in this course.

Benchmarks

Benchmarks test your mastery of course concepts. You have 3 attempts, and your highest score counts.
Note: Cumulative Benchmarks (final exams) only allow 1 attempt.

Capstones

Capstones are project-based assessments that help you apply concepts to real-world scenarios. You have 2 attempts, and your highest score counts.

Checkpoints

Checkpoints are quick knowledge checks on important course concepts. All are open-book, and most have 1-3 attempts.

AI Use-Case Policies

StraighterLine Capstone assessments operate under one of three AI Use-Case Policies. These designations are selected intentionally to support learners in developing digital literacy, ethical reasoning, and authentic communication skills. Each model requires students to engage meaningfully with the course outcomes while adhering to academic standards.

Independent Work Requirement: Capstones with this designation must be completed independently without using AI tools. The goal is for learners to showcase their own understanding and skills without AI assistance. Students are expected to generate and submit original work developed solely through their own reasoning and effort.

AI-Assisted Planning Option: Capstones with this designation may allow AI tools to support brainstorming and assessment planning. If allowed, students will be asked to document any AI assistance by noting how it informed their work. Documentation must be included within the assignment or in a designated reflection field. Examples include describing how an AI tool helped organize an outline, generate ideas, or surface sources for further exploration.

AI-Integration Requirement: Capstones with this designation require AI tools as part of the learning process. Students will be asked to reflect upon their AI interactions and AI contributions to the assessment. Reflections must include which tools were used, how they were used, and what insights students gained from the process. This promotes transparency, ethical use, and metacognitive skill-building.

Course Evaluation Criteria

Your score provides a percentage score and letter grade for each course. A passing percentage is 70% or higher.

There are a total of 1000 points in the course:

Assessment	Points	Learning Outcomes
Checkpoint 1: Getting Started	2	N/a
Checkpoint 2: Lab Safety	2	N/a
Checkpoint 3: Using the V-Scope	2	N/a
Checkpoint 4: Lab Kit Inventory	2	N/a
Capstone 1: The Scientific Method	124	1
Capstone 2: DNA, RNA, and Protein Synthesis	124	2
Capstone 3: Ecological Succession	124	7
Capstone 4: Cell Types - Structure and Function	124	4
Capstone 5: Mendelian Genetics	124	3
Capstone 6: Photosynthesis	124	6
Capstone 7: Population Genetics: Natural Selection and Hardy-Weinberg Equilibrium	124	8
Capstone 8: Mitosis	124	5
Total	**1000**	

Course Roadmap

This roadmap provides an overview of the checkpoints and lessons covered in this course.

Checkpoint 1: Getting Started

- The Science Interactive Cloud
- Exploration, Experimentation, and Evaluation
- Science Interactive Resources

Checkpoint 2: Lab Safety

- Safety guidelines for using Science Interactive lab kits
- Terms associated with common laboratory safety equipment

Checkpoint 3: Using the V-Scope

- The purpose and function of the SI V-Scope
- Controls of the SI V-Scope
- How slides are selected, viewed, downloaded, and instructions are referenced for the SI V-Scope

- Special rules for using the SI V-Scope in lessons requiring microscopy

Checkpoint 4: Lab Kit Inventory

- Kit contents list
- Reviewing your Science Interactive kit

Capstone 1: The Scientific Method

- The steps of the scientific method
- Hypothesis, independent variable, dependent variable, and control.
- Qualitative and quantitative data

Capstone 2: DNA, RNA, and Protein Synthesis

- DNA, codon, and amino acid
- The processes of transcription and translation
- Point and frameshift mutations

Capstone 3: Ecological Succession

- Ecological succession, disturbance, pioneer species, and climax community
- Primary and secondary succession
- Natural and anthropogenic causes of succession

Capstone 4: Cell Types - Structure and Function

- Cell, nucleus, cytoplasm, and cell membrane
- Characteristics of prokaryotic cells
- Major eukaryotic organelles and their functions

Capstone 5: Mendelian Genetics

- Genetics, genotype, phenotype, and allele
- Mendel's plant breeding experiments and conclusions
- Punnett squares and the chi-square test are used to interpret the results of monohybrid and dihybrid crosses

Capstone 6: Photosynthesis

- Photosynthesis and photoautotroph
- Structure of a chloroplast
- Pigments associated with light absorption in plants
- The roles of light-dependent and light-independent reactions in photosynthesis

Capstone 7: Population Genetics: Natural Selection and Hardy-Weinberg Equilibrium

- Evolution, natural selection, population, and allele
- How genetic drift, mutations, and natural selection affect the gene pool of a population
- How the Hardy-Weinberg equation is used to calculate genetic frequencies

Capstone 8: Mitosis

- Stages of the cell cycle
- The process of mitosis

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