# **CBIO 1034 General Biology I Lecture + Lab (Science Majors) Syllabus**

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**Course Number and Title:**   
General Biology I (Science Majors)

**Course Brief Description:**   
**Lecture:** This course covers fundamental principles that govern the characteristics of living organisms. To explain these principles, presented topics will include: The study of life, Chemical foundations of life, Biological molecules, Cell Structure, Structure and function of plasma membranes, Metabolism, Cellular Respiration, Photosynthesis, Cell reproduction, Meiosis and sexual reproduction, Mendel’s Experiments and heredity, Modern understandings of inheritance, DNA structure and function, genes and protein, and Ethics and societal responsibility. By the end of the course, students will be able to demonstrate an understanding of biological concepts that involve chemical and physical laws.

**Lab:** In the laboratory course, interactive scientific investigations will introduce students to the biological principles with actual hands-on applications found routinely in general biology laboratory settings. The student will acquire mastery basic skills that require analysis, reasoning, communication, higher-order thinking, collaboration, and quantitative evaluation. By the end of the laboratory course, students will be able to demonstrate an understanding of biological principles and applications as it relates to the designated experiment.

The course material is presented in a combined lecture and laboratory format.

**Prerequisite Knowledge:**

Students must have sufficient reading skills/general vocabulary to understand college-level writing.

Dual enrolled high school students need to have completed 2 years of English Language Arts. College students need to have qualified to enter freshman English Composition (and/or satisfied any remedial English requirements).

*Include information about biology and chemistry prerequisites.*

**Course Goals:**

Upon successful completion of this course,

* The student will be able to explain and apply the scientific method.
* The student will be able to utilize the concepts of biochemistry, and cell biology.
* The student will explain cellular metabolism by comparing and contrasting photosynthesis and respiration.
* The student will compare and contrast mitosis and meiosis as well as demonstrate the importance of inheritance.
* The student will describe molecular biology (DNA replication and protein synthesis).

**Course Materials:**

As the textbook, this course uses an adaptation of OpenStax’s Biology 2e, licensed under a [Creative Commons Attribution License](http://creativecommons.org/licenses/by/4.0/). This adaptation is available via Pressbooks **[insert link here once book has been published].**

OpenStax publishes additional resources for Biology 2e for both [students](https://openstax.org/details/books/biology-2e?Student%20resources) and [instructors](https://openstax.org/details/books/biology-2e?Instructor%20resources), available at those links.

As the lab manual, this course uses an adaptation of OpenStax’s Biology for AP Courses Lab Manual Student Version, licensed under a [Creative Commons Attribution License](http://creativecommons.org/licenses/by/4.0/). This adaptation is available via Pressbooks **[insert link here once book has been published].**

**Instructor Contact Information:** [*Keep as a placeholder for future adopters]*

Instructor:

* Name:
* Email:
* Phone:
* Office:
* Office Hours:
* Communication/feedback policy: *Include information about how often students can expect to hear from you; how they will receive feedback; and where/when this feedback will occur. For example, “Assignments will be scored and feedback provided weekly via the learning management system. All emails receive a response in 24 hours.”*

**Course Schedule:**

| **Module** | **Topics and Concepts**  **List and describe as necessary the topics and concepts covered in each weekly unit.** | **Corresponding Course Materials**  **Where relevant, indicate if the resource is a chapter(s) or section(s) of a larger resource.** | **Assessments** |
| --- | --- | --- | --- |
| 1 | **The Study of Life:**  The Science of Biology and Themes and Concepts of Biology | Pressbooks Biology 2e Chapter 1  Lab 1: Lab Safety and Measurement | Module 1 Term Assessment |
| 2 | **The Chemical Foundation of Life:** Atoms, Isotopes, Ions, and Molecules: The Building Blocks; Water; and Carbon | Pressbooks Biology 2e Chapter 2  Lab 2: Microscopy | Module 2 Term Assessment |
| 3 | **Biological Macromolecules:** Synthesis of Biological Macromolecules; Carbohydrates; Lipids; Proteins; and Nucleic Acids | Pressbooks Biology 2e Chapter 3  Lab 3: Macromolecules | Module 3 Term Assessment |
| 4 | **Cell Structure:** Studying Cells; Prokaryotic Cells; Eukaryotic Cells; The Endomembrane System and Proteins; The Cytoskeleton; and Connections between Cells | Pressbooks Biology 2e Chapter 4  Lab 4: Cells | Module 4 Term Assessment |
| 5 | **Structure and Function of Plasma Membranes:** Components and Structure; Passive Transport; Active Transport; and Bulk Transport | Pressbooks Biology 2e Chapter 5  Lab 5: Subcellular Structures | Module 5 Term Assessment |
| 6 | **Metabolism:** Energy and Metabolism; Potential, Kinetic, Free, and Activation Energy; The Laws of Thermodynamics; ATP; Enzymes | Pressbooks Biology 2e Chapter 6  Lab 6: Osmosis | Module 6 Term Assessment |
| 7 | **Cellular Respiration:** Energy in Living Systems; Glycolysis; Oxidation of Pyruvate and the Citric Acid Cycle; Oxidative Phosphorylation; Metabolism without Oxygen; Connections of Carbohydrate, Protein, and Lipid Metabolic Pathways; and Regulation of Cellular Respiration | Pressbooks Biology 2e Chapter 7  Lab 7 : Enzymatic | Module 7 Term Assessment |
| 8 | **Photosynthesis:** Overview of Photosynthesis; The Light-Dependent Reactions of Photosynthesis; and Using Light Energy to Make Organic Molecules | Pressbooks Biology 2e Chapter 8  Lab practical (mid-term exam)  [Plant Transpiration lab alternative] | Module 8 Term Assessment |
| 9 | **Cell Reproduction:** Cell Division; The Cell Cycle; Control of the Cell Cycle; Cancer and the Cell Cycle; and Prokaryotic Cell Division | Pressbooks Biology 2e Chapter 10  Lab 8: Respiration | Module 9 Term Assessment |
| 10 | **Meiosis and Sexual Reproduction:** The Process of Meiosis; and Sexual Reproduction | Pressbooks Biology 2e Chapter 11  Lab 9: Fermentation | Module 10 Term Assessment |
| 11 | **Mendel's Experiments and Heredity:** Mendel’s Experiments and the Laws of Probability; and Characteristics and Traits; and Laws of Inheritance | Pressbooks Biology 2e Chapter 12  Lab 10: Plant Pigments | Module 11 Term Assessment |
| 12 | **Modern Understandings of Inheritance:** Chromosomal Theory and Genetic Linkage; and Chromosomal Basis of Inherited Disorders | Pressbooks Biology 2e Chapter 13  Lab 11: Light Reaction | Module 12 Term Assessment |
| 13 | **DNA Structure and Function:** Historical Basis of Modern Understanding; DNA Structure and Sequencing; Basics of DNA Replication; DNA Replication in Prokaryotes; DNA Replication in Eukaryotes; DNA Repair | Pressbooks Biology 2e Chapter 14  Lab 12: Mitosis and Meiosis  [Strawberry DNA extraction lab alternative] | Module 13 Term Assessment |
| 14 | **Genes and Proteins:** The Genetic Code; Prokaryotic Transcription; Eukaryotic Transcription; RNA Processing in Eukaryotes; and Ribosomes and Protein | Pressbooks Biology 2e Chapter 15  Lab 13: Mendelian Genetics  **[Gene Protein lab alternative forthcoming: by Ruby]** | Module 14 Term Assessment |
| 15 | **Ethics and societal responsibility** | Pressbooks Biology 2e Chapter 17  Lab practical 2 (final exam) | Module 15 Term Assessment |

**Course Policies:**

* **Technology Requirements and Computer Skills:**
* Students taking the course should have access to a printer and a computer or laptop with a web camera, audio and voice recording capabilities.
* Students will be required to use email (with attachments) and the institution’s Learning Management System (best accessed using Firefox or Google Chrome), copy and paste information in various documents, create and submit documents or files using Microsoft Word, download and install software as needed, upload software, and use PowerPoint or other presentation software. The student must be able to upload and download software in order to complete work.
* (Instructor: also specifies requirements for internet speed, web camera, video and audio recording capabilities, printing, other software needed, and file format used for submission of work, and recency of versions needed of each, as applicable.)
* **Learner Interaction**
  + *Example: Students are expected to check their school-related email daily. Students are expected to post weekly discussion board posts as well as respond to classmates’ posts weekly.*
* **Evaluation** 
  + **Module labs:** Each module includes lab(s) means to reinforce and augment elements from the lecture course.
  + **Lab Practical:** There will be 2 lab practicals.
  + **Discussion and Assignment Activities:** These are designed to accompany the learning objectives for each module.
* **Grading Policy**
  + *Grading scale and late work policy, if applicable. For example:*

|  |  |
| --- | --- |
| *Assignments & Activities* | *Percentage* |
| *Discussions (15 discussions)* | *25%* |
| *Term Assessment (15 assignments)* | *25%* |
| *Midterm Exam* | *25%* |
| *Final Exam* | *25%* |
| *Total* | *100%* |

* + *Include the school’s adopted grading scale, if applicable. Include information about whether assignments and/or grades will be rounded, for example, “Grades for individual assignments and final grades will be rounded up from .50.”*
  + *Provide detail on whether late submissions will be accepted and, if so, whether there is a penalty and how that penalty will be determined.*

**University Policies and Support:** *[Keep as a placeholder for future adopters]*

* **Code of Conduct**
* **Online Etiquette**
* **Academic Integrity**
* **Diversity Statement**
* **Accessibility and Disability Services**
* **Technology Support**
* **Academic Support Services**