BIOLOGY: GENERAL COURSES (BIOG)

BIOG 1009 - Prefreshman Summer Program Biology (2 Credits)
Last Four Terms Offered: Summer 2025, Summer 2024, Summer 2023, Summer 2022
Schedule of Classes (https://classes.cornell.edu/)

BIOG 1044 - Academic Support for BIOG 1440: Physiology (1 Credit)
This course reviews material presented in BIOG 1440 and provides problem-solving strategies and additional practice with material. BIOG 1044 support is recommended for students who want to maximize their understanding of Comparative Physiology and enhance their learning skills. BIOG 1044 is not a substitute for BIOG 1440.
Corequisites: BIOG 1440.
Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023
Learning Outcomes:

- Ability to solve problems based on BIOG 1440 material.
- Formulate hypotheses using concepts from BIOG 1440.
- Demonstrate their learning on BIOG 1440 exams.
- Design effective study and time management plans.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 1101 - Introductory Biology I (4 Credits)
Biology I and Biology II are a two-semester course sequence designed to consolidate major biological concepts and practices offered in a setting that includes both lecture and lab in each semester. Biology I, offered in fall semester, focuses on biochemistry and cell biology with topics on biologically important molecules, enzyme kinetics, cellular metabolism and regulation, cell theory, cell structure and function, cell signaling, and introduction to genetics. The laboratory component connects the concepts with hands-on experiments using modern wet-lab technology with additional emphasis on research competency that focuses on the scientific method, experimental design, statistical testing, scientific writing, and information literacy.
Distribution Requirements: (SCT-IL)
Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021
Schedule of Classes (https://classes.cornell.edu/)

BIOG 1102 - Introductory Biology II (4 Credits)
Biology I and Biology II are a two-semester course sequence designed to consolidate major biological concepts and practices offered in a setting that includes both lecture and lab in each semester. Biology II, offered in the spring semester focuses on nucleic acid structure and function, gene expression and regulation in prokaryotes and eukaryotes, biotechnology, population genetics, systematics and biodiversity, population biology and demography. The laboratory component connects the concepts with hands-on experiments using modern wet-lab technology and bioinformatics. The coverage of research competency continues from Biology I with the development of research poster and poster presentation and the emphasis of ethical behavior in research.
Prerequisites: BIOG 1101.
Distribution Requirements: (SCT-IL)
Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022
Schedule of Classes (https://classes.cornell.edu/)

BIOG 1111 - Paths to Success in the Biological Sciences Major (1 Credit)
This course is for first-year students entering or intending to enter the Biological Sciences major in either the College of Agriculture and Life Sciences (CALS) or College of Arts & Sciences. This course will empower you to find your purpose as part of a diverse and inclusive global community of learners and focuses on facilitating your transition to college life, developing your academic identity, and making your time at Cornell a meaningful experience. You will develop a learning community, identify your support network, and explore what Cornell offers to you as a first-year student. We will work with you to develop skills for balancing academic success with extracurricular and interpersonal activities during your time in the major.
Enrollment Information: Primarily for: CALS first-year students in the Biological Sciences major and CAS first-year students intending to enter the Biological Sciences major.
Last Four Terms Offered: Fall 2024
Learning Outcomes:

- Students will be able to describe what you can learn and experience in your major and develop potential paths associated with your major.
- Students will be able to identify your academic goals and the opportunities, resources and services that are available to help you meet these goals.
- Students will be able to identify and acknowledge your social identity, cultural rules, and biases, along with the inherent value of being open to diverse perspectives.
- Students will be able to communicate effectively and professionally with members of the Cornell community.
- Students will be able to develop and maintain a learning community and a support network.
- Students will be able to engage in self-reflection about how you think and learn, how you interact with others, how to navigate your academic experience ethically and with integrity, and how you respond to new information.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 1130 - Topics in Introductory Biology (3-4 Credits)
Topics in Introductory Biology is intended to encompass a range of non-majors level introductory biology courses offered through the Cornell Prison Education Program. The topics of individual offerings potentially cover the breadth of biology from cell and molecular biology to ecology, or genetics through evolution.
Last Four Terms Offered: Spring 2025, Summer 2024, Spring 2024, Spring 2023
Learning Outcomes:

- Students will be able to explain the science of biology and its relevance to students as individuals and to society as a whole.
- Students will be able to describe science as a process which in its many variations, provides a constantly evolving description of the world we live in.
- Students will be able to critically explain information derived from non-science sources (magazines, newspapers, websites, blogs).
- Students will be able to apply factual information through application to problems rather than simply knowing facts.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 1140 - Foundations of Biology (4 Credits)
The course offers an introduction to biology at the cell and molecular levels, including cell function, energetics, Mendelian genetics, molecular genetics, DNA technology and evolution. The emphasis is on key concepts that underlie living systems, rather than a myriad of unrelated facts. This is a lecture course with an integrated discussion section in which active learning and student engagement activities further emphasize the key concepts with compelling examples from living systems. Designed to meet the biology requirements of science students who need to fulfill the distribution requirement in CALS and Human Ecology. It does not meet the requirement for the premedical or prevet program nor the major in biological science. It, along with courses in the core major program, may be used to fulfill the Arts and Sciences distribution requirement. There is no laboratory for this course. Students that require a biology laboratory experience as part of their requirements should enroll in BIOG 1500 .This course is suitable for life sciences majors.
Distribution Requirements: (BIO-AG, BSC-AG, OPHLS-AG), (BIO-AS), (SCT-IL)
Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021
Schedule of Classes (https://classes.cornell.edu/)

BIOG 1180 - Ethics in Life Sciences (3 Credits)
Ethical issues invariably arise when conducting research in, and generally thinking about, the life sciences. How should human and animal cells be used and when? What harms, risks and benefits might be associated with advances being made in synthetic biology or in the genetic modification of organisms? How does our understanding of microbiome alter our notions of an individual or of a disease? Does the environment have value only insofar as it contributes to humans ends, or does it have value in itself? How much empirical evidence is sufficient before drawing a conclusion? Does what we learn in science change the nature of our ethical frameworks? This course considers these issues and others. In doing so, we'll examine some ethical theory and some recent scientific research in order to survey the scope of topics at the intersection of ethics and the life sciences.
Distribution Requirements: (BIO-AG, ETH-AG, OPHLS-AG)
Last Four Terms Offered: Spring 2025
Learning Outcomes:
- Students will be able to identify, explain, and evaluate key issues and arguments in the ethics of life sciences.
- Students will be able to formulate, explain and defend ethical positions that can be held in the life sciences.
- Students will be able to apply ethical theories to issues in the life sciences as they arise.
- Students will be able to identify areas in the life sciences that may have important impacts in various modes of ethical inquiry.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 1190 - Introduction to General Biology (3 Credits)
This course provides students with the necessary foundational knowledge and skills to continue studies in general biology in the pre-medical curriculum of the six-year medical program. Students will have the necessary biological language ability to enter the six-year medical program including reading and comprehending a college text, summarizing text material and identifying key concepts. Through the study of basic cellular level process, students can advance to organism and population level study. This course is suitable for life sciences majors.
Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023
Learning Outcomes:
- Students will be able to demonstrate a basic understanding of molecular and cellular biology.
- Students will be able to demonstrate a basic understanding of evolution and the diversity of life.
- Students will be able to demonstrate the basic lab skills needed for the practical study of general biology.
- Students will be able to communicate important biological concepts clearly using the correct terminology, and express opinions and knowledge of the subject with clarity.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 1191 - Introduction to Human Biology (3 Credits)
This course enables students to apply fundamental knowledge of general biology for higher level learning and critical thinking relating to human biology. The course will provide a basic understanding of particular human organ systems, their structure and function. It will also foster an understanding of the interaction between organ system function, and the maintenance of health. Lab dissections will provide students with the opportunity to improve manual dexterity and hand-eye coordination. This course is suitable for life sciences majors.
Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023
Learning Outcomes:
- Students will be able to demonstrate a basic understanding of the development, structure and function of the different organ systems covered by this module.
- Students will be able to explain the role of organ systems in the maintenance of health.
- Students will be able to demonstrate awareness of the effect of time upon the organ systems in relation to function and health.
- Students will be able to communicate these concepts clearly, and express opinions and knowledge of the subject with clarity.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 1200 - Biology Scholars Program First-year Seminar (1 Credit)
This course is designed to help first-year biological sciences majors make the transition to Cornell's science courses, give exposure to career options in research and medicine, provide opportunities to meet and network with faculty, and to facilitate students' pursuit of research on campus.
Enrollment Information: Enrollment limited to: membership in the Biology Scholars Program.
Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022
Learning Outcomes:

- Students will be able to conduct an effective search for a research opportunity.
- Students will be able to reflect on lab visit experiences and discussions with faculty and undergraduate, graduate, and post-doctoral researchers and report on new learning and interests in research at Cornell.
- Students will be able to explore and reflect on pathways to careers in science

Schedule of Classes (https://classes.cornell.edu/)

BIOG 1250 - Biology Seminar (1-2 Credits)
A first-year seminar that provides an opportunity for students to participate in a small group, interactive course with a biologist. Students will develop critical thinking skills by exploring topics in the biological sciences (review at least one scientific paper). Multiple topics and sections will be offered each semester.
Last Four Terms Offered: Fall 2024, Spring 2024, Fall 2023, Spring 2023
Schedule of Classes (https://classes.cornell.edu/)

BIOG 1440 - Introductory Biology: Comparative Physiology (3 Credits)
An introductory physiology course intended for first-year and sophomore biological sciences majors and other students majoring in life sciences. The course integrates physiology from the cell to the organism with comparisons among animals, plants and microbes. Emphasis is on understanding of basic physiological concepts, stressing structure-function relationships and underlying physio-chemical mechanisms.
Forbidden Overlaps: BIOG 1440, BIOG 1445
Distribution Requirements: (BIO-AG, BSC-AG, OPHLS-AG), (BIO-AS)
Last Four Terms Offered: Summer 2025, Spring 2025, Fall 2024, Summer 2024
Learning Outcomes:

- Students will be able to understand the principles of how organisms work at the molecular, cellular, and systems levels, how these principles are based on the rules of physics and chemistry, and how the processes of physiology at one level emerge from processes at the lower levels.
- Students will be able to think like a physiologist. This involves understanding how the properties of cells determine function at all higher levels of biological organization including how cellular membranes create selective barriers and how substances cross these barriers, how biological processes are regulated, and how cells and organisms exchange energy and matter with the environment, respond to their environment (including stimulus transduction, intercellular communication, and information processing), and generate mechanical forces and movement.
- Students will be able to appreciate the similarities and differences between the physiologies of humans and other organisms, and so to appreciate how the study of comparative physiology is relevant to understanding your own life, and to understanding how evolution explains both the unity and diversity of life.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 1445 - Introduction to Comparative Anatomy and Physiology, Individualized Instruction (3 Credits)
This course is an introductory comparative anatomy and physiology course designed primarily for first- and second-year life science students. The course focuses on the understanding of how different biological organisms (animals, plants, microbes, fungi) perform common physiological functions, focusing on relationship between structure and function and environmental adaptations. The course is based on individualized instruction and offers flexibility in scheduling. Completion of the course requires mastery of a set of core units. Four formal laboratory sessions are offered with additional laboratory work incorporated into the core units.
Forbidden Overlaps: BIOG 1440, BIOG 1445
Enrollment Information: Primarily for: first-year and sophomore biology majors who desire an introduction to concepts of physiology.
Distribution Requirements: (BIO-AG, BSC-AG, OPHLS-AG), (BIO-AS)
Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023
Learning Outcomes:

- Identify the underlying principles shared by physiological systems, at the molecular, cellular, and systems levels and relate these principles to the physical and thermodynamic laws that influence organismal design
- 2- Recognize the diversity of physiological systems and correlate the interactions of these systems with anatomical structure.
- Utilize critical thinking and analytical skills when addressing physiological issues to explain organisms' adaptations to their environments.
- Orally communicate complex ideas in direct and organized manner.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 1470 - CURE: Research Experience in Animal Physiology (2 Credits)
This course introduces the process of biological research to biological sciences majors. Students will learn how to design, perform, and report original research with guidance along each step. The research will focus on cardiopulmonary function. Students will meet weekly and be presented with issues in research and apply that information in the lab executing experiments.
Learning Outcomes:

- Explore literature and use library skills.
- Define a research question.
- Design and complete scientific investigations in biology.
- Analyze and interpret data.
- Present scientific results to a variety of populations.
- Critically analyze scientific research.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 1500 - Investigative Biology Laboratory (2 Credits)
This course is designed to provide lab experience with an emphasis on the processes of scientific investigation and to promote collaboration, communication, and literacy in science. This lab course aims to teach skills, especially critical thinking and problem solving, that students can apply in research laboratories at Cornell and after graduation. These skills go far beyond learning how to use laboratory equipment. The course introduces students to a laboratory research environment, teamwork, hypothesis formation, experimental design, statistics, and research ethics. Students gain information and science literacy skills and practice many forms of science communication, from presentations to proposal writing and scientific poster preparation. Students first fill their scientific toolbox and then develop the capacity to solve increasingly challenging problems more independently.
Distribution Requirements: (BIO-AG, OPHLS-AG)
Last Four Terms Offered: Summer 2025, Spring 2025, Fall 2024, Summer 2024
Learning Outcomes:

- Design hypothesis-based experiments, choose appropriate statistical test(s), analyze data, and interpret results.
- Demonstrate mastery of lab techniques and scientific methods that can be applied across biological systems and scales.
- Find and evaluate relevant scientific information using appropriate library tools.
- Effectively contribute to work within their research groups and reflect on the ethics, benefits, and challenges of collaborative work.
- Use discovery science to explore patterns in nature and apply accuracy and precision to the scientific process.
- Apply fundamental biological information to increasingly novel and complex situations.
- Author and produce scientific content using digital, oral, visual, audio, and written communication formats.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 1990 - Exploring Research in Biological Sciences (1 Credit)
Students will learn about the research process, explore their research interests, discover how to find and apply for research positions, receive feedback on their application materials, and discuss how to continue developing as a researcher once they secure a position. This course is designed for students with no previous research experience or with limited experience and who would like to get involved in research during the summer or upcoming academic year.
Enrollment Information: Open to: first-year Cornell students in the Biological Sciences major.
Exploratory Studies: (CU-UG)

Last Four Terms Offered: Spring 2023
Learning Outcomes:

- Identify research opportunities available to Cornell undergraduates in a variety of life science fields.
- Demonstrate strategies for approaching a faculty member to discuss research opportunities with the goal of finding a research position.
- Effectively communicate their research or academic interests to peers and researchers (including faculty, graduate students, post-docs).
- Discuss common expectations of undergraduates joining a research lab for the first time.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 2000 - Special Studies in Biology (1-6 Credits)
Registration device for students who want to take only a portion of a regular biological sciences course-for example, only the lectures or only the laboratory in a course that includes both. Only students who have already had training equivalent to the portion of the regular course that is to be omitted may register in this manner. This course may not be used to fulfill college distribution requirements except by permission from the Office of Undergraduate Biology.
Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023
Schedule of Classes (https://classes.cornell.edu/)

BIOG 2010 - Physiology and Underlying Physics Foundations (4 Credits)
This course is an integration of human physiology and the underlying physics concepts. Lectures will cover basic physics concepts associated with physiology or medical application as well as the physiology underlying the human nervous, skeletomuscular and cardiovascular systems. Recitation sessions will support the lecture material with application of the principles covered. Practical classes will cover both the physics and physiological principles as they relate to the systems studied with an emphasis on application to medical practice. By the end of this course students should be able to demonstrate an understanding of the relationship between physics, anatomy and physiological functions.
Prerequisites: BIOG 1101, BIOG 1102, PHYS 2299.
Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021
Learning Outcomes:

- Students will be able to explain physiological mechanisms by applying the basic principles of physics.
- Students will be able to recognize and explain the principle of homeostasis and the use of feedback loops to control physiological systems in the human body.
- Students will be able to describe and explain the basic physiological principles underlying the normal function of the nervous, muscular, cardiovascular and pulmonary systems.
- Students will be able to document and maintain clear, understandable records of the work performed in the laboratory.
- Students will be able to interpret and draw inferences from experimental measurements recorded in the laboratory.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 2011 - Physiology and Immunology (3 Credits)
This course follows on from BIOG 2010 (Physiology and Physics) last semester in further developing the students understanding of organ system Physiology. The organ systems covered will be the pulmonary, gastro-intestinal, renal, endocrine and reproductive. Students will also be introduced to the human immune system. This includes an introduction to the cells, molecules and tissues that comprise the immune system and the ways these components participate in immune responses to infectious microorganisms in the human. Tutorials will emphasize the clinical aspect of the organ systems as well as their response to immunological disruption.
Prerequisites: BIOG 1101, BIOG 1102.
Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022
Learning Outcomes:

- Students will be able to describe and explain the basic physiological principles underlying the normal function of the pulmonary, gastro-intestinal, renal, endocrine, and reproductive systems.
- Students will be able to acquire a fundamental working knowledge of the structures and functions of the human immune system.
- Students will be able to describe how the cellular and molecular components of the immune system work together to resist infection by microorganisms and parasites.
- Students will be able to discuss how allergies and autoimmune diseases develop.
- Students will be able to explain the symptoms of medical disorders using physiological and immunological concepts.
- Students will be able to critically evaluate current scientific literature and write reports that synthesize and integrate data and hypotheses.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 2020 - Human Development and Structure (3 Credits)
This course will use a systems approach to study human structure, embedding medical terminology throughout. Each system will be examined in terms of early development, histology, functional anatomy, and evolutionary history. It will serve as a sister course to Physiology 1, and Physiology 2 so will be closely coordinated with them. Tutorials will be used to emphasize these connections and to introduce pathology. Systems covered will include: nervous system, endocrine system, integumentary system, skeletal system, muscular system, respiratory system, circulatory system, digestive system, reproductive system, and urinary system.
Prerequisites: BIOG 1101.
Distribution Requirements: (OPHLS-AG)
Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021
Learning Outcomes:

- Students will be able to demonstrate a basic understanding of the development and structure of the different organ systems covered by this module.
- Students will be able to demonstrate a basic understanding of histology, and be able to identify major tissue types.
- Students will be able to explain the role of organ systems in the maintenance of health.
- Students will be able to communicate these concepts clearly using the correct terminology, and express opinions and knowledge of the subject with clarity.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 2025 - Blood Biology and Pathophysiology (3 Credits)
This course is designed to explore human blood biology and pathophysiology at an introductory level. It's aimed for students who wish to pursue careers in biological or medical sciences as either researchers or clinical practitioners. The course is offered in collaboration with Carnegie Mellon University - Qatar. Aims of the course: a) to explore the nature and function of blood and hematopoietic organs that participate in the generation, maturation and function of blood cells b) to develop a basic knowledge of the processes of hemostasis and transfusion medicine, its impact on different diseases and medical management, and the fundamentals of hematopoietic stem cell transplant. The course focusses on underlying biological mechanisms that sustain homeostasis, events that lead to different pathologic processes, and the rationale of current targeted therapies in precision medicine. It will provide a theoretical basis of knowledge supplemented by an introductory practice of commonly used laboratory tests to assess blood-related diseases.
Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022
Learning Outcomes:

- Students will be able to explain biology of blood and related organs in both health and diseases.
- Students will be able to explain the role of genetics and environment in the development of pathological processes.
- Students will be able to explain the basis of laboratory tests that apply in diagnosis as well as the foundation of the current targeted therapies.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 2045 - Introduction to Human Genetics (2 Credits)
This undergraduate course focuses on fundamental principles of Mendelian inheritance, applied to the genetic characterization of human diseases. The topics covered include patterns of inheritance for Mendelian human traits, mapping and identification of gene variants and mutations in humans. Elements of cancer genetics, as well as some general principles of genetic testing and counseling are discussed. Aims of the course a) to explore fundamental concepts of inheritance (i.e. structure and function of the genetic material, basic Mendelian genetics principles, mitotic and meiotic cell divisions, control of the cell cycle phases) b) to develop a basic knowledge of Mendelian modes of inheritance in humans, Mutation, Variation in humans and genetic testing, Chromosomal basis of human disease, and Cancer genetics.
Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022
Learning Outcomes:

- Students will be able to explain biology of blood and related organs in both health and diseases.
- Students will be able to explain the role of genetics and environment in the development of pathological processes.
- Students will be able to explain the basis of laboratory tests that apply in diagnosis as well as the foundation of the current targeted therapies.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 2200 - Biology Scholars Program Sophomore Seminar (1 Credit)
The first half of the semester will focus on interpreting and evaluating scientific literature. Students will do group presentations on a primary research or review paper. The second half will cover careers in science, personal and professional development, on-campus research, and summer opportunities.
Enrollment Information: Enrollment limited to: membership in the Biology Scholars Program.
Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021
Learning Outcomes:

- Students will be able to build and practice presentation skills.
- Students will be able to read, interpret, evaluate, and present scientific literature to peers and faculty.
- Students will be able to work effectively with small peer group.
- Students will be able to assess personal strengths and how they can best be used to meet goals.
- Students will be able to learn how to write an effective personal statement.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 2400 - Developing a Reflective Study Group Leader Practice (2 Credits)
Students will complete readings and view online media on teaching and learning, create and critique lesson plans, and participate in regular discussions with other SGLs. Each week SGLs will reflect on their group meetings through both writing and discussion, and review challenges and successes during trainings. The SGL position is a year-long commitment; members will enroll in BIOG 2401 in the spring. Topics covered in BIOG 2400 and 2401 include leading effective groups, cognitive taxonomy, motivation techniques, facilitating discussion, learning styles, growth mindset, metacognition, resilience, community building, and supporting students from diverse backgrounds.
Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021
Learning Outcomes:

- Students will be able to foster a safe and welcoming environment centered on collaborative learning.
- Students will be able to develop collaborative learning exercises and effective group facilitation/group discussion strategies in support of courses required by the Biological Sciences major.
- Students will be able to construct effective lesson plans that challenge students at or just above their level of understanding in the subject.
- Students will be able to use teaching and learning theories along with feedback from group members to plan for and conduct study group.
- Students will be able to understand and respond to needs of diverse learners, who are sometimes from disadvantaged/marginalized backgrounds.
- Students will be able to reflect on development as a Study Group Leader and identify areas needing improvement.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 2401 - Developing a Reflective Study Group Leader Practice II (2-3 Credits)
Students will complete readings and view online media on teaching and learning, create and critique lesson plans, and participate in regular discussions with other SGLs. Each week SGLs will reflect on their group meetings through both writing and discussion, and review challenges and successes during trainings. The SGL position is a year-long commitment; members will enroll in BIOG 2401 in the spring. Topics covered in BIOG 2400 and 2401 include leading effective groups, cognitive taxonomy, motivation techniques, facilitating discussion, learning styles, growth mindset, metacognition, resilience, community building, and supporting students from diverse backgrounds.
Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022
Learning Outcomes:

- Students will be able to foster a safe and welcoming environment centered on collaborative learning.
- Students will be able to develop collaborative learning exercises and effective group facilitation/group discussion strategies in support of courses required by the Biological Sciences major.
- Students will be able to construct effective lesson plans that challenge students at or just above their level of understanding in the subject.
- Students will be able to use teaching and learning theories along with feedback from group members to plan for and conduct study group.
- Students will be able to understand and respond to needs of diverse learners, who are sometimes from disadvantaged/marginalized backgrounds.
- Students will be able to reflect on development as a Study Group Leader and identify areas needing improvement.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 2500 - Develop a Reflective Learning Assistant (1 Credit)
Learning Assistants (LAs) aid in facilitating the learning process for small groups of first-year students enrolled in BIOG 1111: Paths to Success in the Biological Sciences Major. LAs work closely with instructors to help students engage with and understand the material being taught. Through training, weekly pre-class reflections, and small group work in the classroom, LAs communicate complex ideas, manage group dynamics, and provide constructive feedback on student assignments.
Schedule of Classes (https://classes.cornell.edu/)

BIOG 2990 - Introduction to Research Methods in Biology (1-3 Credits)
Intended for students who are new to undergraduate research. Students enrolled in BIOG 2990 may be reading scientific literature, learning research techniques, or assisting with ongoing research. The faculty supervisor determines the work goals and the form of the final report. Any Cornell faculty member whose research field is biological in nature may serve as a supervisor for this course. Non-Cornell supervisors are not acceptable.
Exploratory Studies: (CU-UG)

Last Four Terms Offered: Summer 2025, Spring 2025, Fall 2024, Spring 2024
Schedule of Classes (https://classes.cornell.edu/)

BIOG 3000 - Capstone Lab Experience (2 Credits)
This course is offered to students studying at Weill Cornell Medicine-Qatar. Advanced Lab provides an introduction to some key concepts integral to the study of medicine. The course affords students an opportunity to learn, apply, integrate, and demonstrate the knowledge and skills of biology, biochemistry, and chemistry. Students are required to complete one 3-week exercise in each of three course themes. These offered may vary due to availability of faculty.
Prerequisites: BIOG 1101, BIOG 1102.
Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022
Learning Outcomes:

- Students will be able to demonstrate hands-on experience with equipment and techniques used in modern laboratory investigations.
- Students will be able to communicate scientific results clearly and concisely through technical writing.
- Students will be able to develop proficiency in the use of technology for generating reports, analyzing and representing data, and disseminating scientific results.
- Students will be able to implement problem solving, teamwork, and design skills.
- Students will be able to further develop oral communication skills through poster or podium presentations.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 3100 - Preparing HHMI-CURT Scholars for Research (1 Credit)
This course is for students in the HHMI-Cornell Research Transfer (CURT) program, and will introduce HHMI-CURT Scholars to faculty research, include scholar presentations, and serve as a forum for HHMI-CURT Scholars to discuss potential difficulties or success in labs.
Enrollment Information: Enrollment limited to: participation in the HHMI-Cornell University Research Transfer (CURT) program.
Exploratory Studies: (CU-UG)

Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023
Learning Outcomes:

- Students will be able to explain faculty research in life science.
- Students will be able to orally communicate concepts in life science.
- Students will be able to critically evaluate primary life science research literature and primary laboratory findings.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 3345 - Principles of Biochemistry: Structure and Function of Biomolecules (3 Credits)
This course provides an overview of the main aspects of biochemistry and relates molecular interactions to their effects on the organism as a whole, especially as related to human biology. The organization of macromolecules is addressed through a discussion of their hierarchical structure and a study of their assembly into complexes responsible for specific biological processes. The overall goal of this course is to impart basic knowledge of biomolecular structure and function and to familiarize students with fundamental biochemical concepts and techniques.
Prerequisites: BIOG 1101, BIOG 1102.
Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021
Learning Outcomes:

- Students will be able to describe basic cellular structure.
- Students will be able to describe the properties of water and how the aqueous environment influences the behavior of biological macromolecules.
- Students will be able to describe the structures of amino acids, their chemical properties and their organization into polypeptides and proteins.
- Students will be able to describe the methods for isolating and characterizing proteins.
- Students will be able to understand the basic elements of protein structure.
- Students will be able to outline the key principles of protein function.
- Students will be able to describe enzymes and how they catalyze reactions as well as enzyme kinetics.
- Students will be able to outline the structure of fundamental monosaccharides and polysaccharides.
- Students will be able to describe the structure and basic function of nucleotides.
- Students will be able to describe the structure of different classes of lipids and their roles in biological systems.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 3500 - Introduction to Applied Science Communication: Digital Platforms and Public Engagement (3 Credits)
Do you want to use digital platforms to reach your audience and communicate science beyond conference seminars, posters and journal articles? You need a science communication strategy! Sharing scientific discoveries is a skill that all scholars should have. In this course you will learn from librarians, local science cafe curators, podcast producers and from scientists and communication professionals how to build an audience using digital platforms. Fill your science communication tool box, learn how to engage a non-scientist audience through storytelling using videos, podcasts, Wikipedia editing, public science events, social media platforms, blogging and press release writing. Work in groups to apply your skills to a topic of your own research interest. An Engaged Cornell grant will support students' participation in a local science cafe.
Distribution Requirements: (WRT-AG)
Exploratory Studies: (CU-CEL)

Last Four Terms Offered: Summer 2025, Winter 2025, Summer 2024, Winter 2024
Learning Outcomes:

- Students will be able to demonstrate how to engage the public in a scientific dialogue using a science communication strategy plan.
- Students will be able to to translate scientific journal articles into easily consumable content for the public.
- Students will be able to gain hands-on experience with digital communication platforms and learn how to prepare information suitable for those platforms.
- Students will be able to understand and apply the components of science literacy.
- Students will be able to improve their critical thinking skills as they analyze and evaluate potential media information sources. By doing so, students will gain a deeper appreciation for how information is produced and consumed.
- Students will be able to develop skills necessary for today's education and tomorrow's employment.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 4000 - Undergraduate Seminar in Biology (2 Credits)
Specialized seminars on topics of interest to undergraduates studying at Weill Cornell Medical College in Qatar.
Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021
Schedule of Classes (https://classes.cornell.edu/)

BIOG 4001 - Undergraduate Seminar in Biology 2 (1 Credit)
Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022
Schedule of Classes (https://classes.cornell.edu/)

BIOG 4002 - Neuroscience Seminar (2 Credits)
A lecture course introducing the fundamentals of neurophysiology, neurochemistry, cellular neurobiology, neuroanatomy, and sensory and motor systems.
Prerequisites: D grades in BIOG 1102, CHEM 2080 and PHYS 2207 (although C grade or better is strongly recommended) or permission of instructor.
Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021
Schedule of Classes (https://classes.cornell.edu/)

BIOG 4003 - Immunology Seminar (2 Credits)
Last Four Terms Offered: Spring 2025, Spring 2024, Spring 2023, Spring 2022
Schedule of Classes (https://classes.cornell.edu/)

BIOG 4970 - Independent Study in Biology (1-3 Credits)
This course is designed for a student to study a problem or topic not covered in a regular course or undertake tutorial study of an independent nature in an area of interest in Biology, under the supervision of a faculty member in any biology department that does not have its own Independent Study course, i.e., Animal Physiology, Ecology & Evolutionary Biology, Microbiology, Molecular Biology & Genetics, Neurobiology & Behavior. The student's academic advisor must approve the course for it to be used to satisfy a Biological Sciences concentration requirement. Students must register using the CALS Special Studies form available online.
Last Four Terms Offered: Summer 2025, Spring 2025, Fall 2024, Spring 2024
Schedule of Classes (https://classes.cornell.edu/)

BIOG 4980 - Teaching Experience (1-4 Credits)
Designed to give qualified undergraduate students teaching experience through actual involvement in planning and assisting in biology courses. This experience may include supervised participation in a discussion group, assisting in a biology laboratory, assisting in field biology, or tutoring.
Prerequisites: previous enrollment in course to be taught or equivalent.
Last Four Terms Offered: Spring 2025, Fall 2024, Spring 2024, Fall 2023
Schedule of Classes (https://classes.cornell.edu/)

BIOG 4990 - Independent Undergraduate Research in Biology (1-8 Credits)
For students with previous undergraduate experience conducting biological research at Cornell. Students enrolled for this credit should be doing independent work on their own project. Any Cornell faculty member whose research field is biological in nature may serve as supervisor for this course. Non-Cornell supervisors are not acceptable.
Prerequisites: one semester BIOG 2990 or equivalent or permission of instructor.
Exploratory Studies: (CU-UG)

Last Four Terms Offered: Summer 2025, Spring 2025, Fall 2024, Summer 2024
Schedule of Classes (https://classes.cornell.edu/)

BIOG 4997 - Biological Sciences Practical Training (0.25 Credits)
This independent study course offers students in the Biological Sciences major an opportunity to reflect on professional and personal growth, challenges, and opportunities resulting from a recent internship or training experience. International students should contact the Office of Global Learning to determine if they need work authorization. Typically, these internships/experiences take place in the summer and students, in the semester they return to campus, write a paper describing their work experience and how it connects to their personal educational and career goals as well as the learning objectives of the Biological Sciences major. The value of the course is in the deep reflection on expectations, successes, challenges and skills and knowledge gained during the internship.
Last Four Terms Offered: Spring 2025, Fall 2024, Fall 2023
Learning Outcomes:

- Describe the ways in which the internship experience met, exceeded, or did not meet the students' expectations at the outset. This includes the experience alignment with the employer's description as well as the students personal and professional set of values and ethics.
- Identify knowledge, skills, or other experiences (in the conceptual, technical and social realm) that would be beneficial going forward in preparation for successful future in a chosen career based on the internship experience.
- Identify how the experiences supplements, builds-upon, or extends the skill the student is developing as a biological sciences major.
- Weigh the benefits and the challenges of working in a new environment.
- Synthesize the component reflections on strengths, challenges, expectations, and personal values into an exploration of potential career paths going forward.

Schedule of Classes (https://classes.cornell.edu/)

BIOG 6500 - Pedagogy, Active Learning, and Education Research Training in the Biology (1 Credit)
This course is designed for the graduate student instructors who are interested in teaching in the biological sciences. This course provides transferable pedagogical skills, focusing on discipline-based education research, active learning, undergraduate TA mentoring, metacognition and best teaching practices in biology courses. The course is taught by the Investigative Biology Teaching Laboratories director and educational postdoctoral fellows. Graduate students receive the reading materials (books and journal articles) in advance, and are expected to lead discussions about their chosen topics. Each session will include guided reflections to help instructors connect their own teaching experiences to that week's topic in education research. By the end of the semester students will become familiar with education research, receive training in modern pedagogical methods and will be able to practice their newly gained skills in the courses they teach. They will walk away with a peer-reviewed statement of teaching philosophy that can be used in their teaching portfolios. This course is intended to provide formal training in pedagogy and education research to the graduate student instructors in biology courses, and help them develop a professional teaching portfolio in addition to their teaching experience.
Last Four Terms Offered: Fall 2024, Fall 2023, Fall 2022, Fall 2021
Learning Outcomes:

- Students will be able to demonstrate modern pedagogical methods in their own laboratory sections.
- Students will be able to assess active learning strategies used in biology education.
- Students will be able to develop pedagogical strategies based on discipline-based education research.
- Students will be able to implement active learning and other effective teaching methods in science for biology laboratories.
- Students will be able to present a comprehensive statement of teaching philosophy based on education research, modern pedagogical methods and their own teaching experience.

Schedule of Classes (https://classes.cornell.edu/)