

“OUR BIOLOGICAL SELVES”

INTERDISCIPLINARY BIOLOGY II (BIO1201-ID) ONLINE SYLLABUS

	NEW YORK CITY COLLEGE OF TECHNOLOGY The City University Of New York	School of Arts and Sciences Biological Sciences Department	
Course Information			
Course title:	Biology II (Lecture and Laboratory)	Course code:	BIO1201ID
Credit Hours:	4 credit hours	3 hours lecture and 3 hours lab per week for 15 weeks	
Prerequisite:	BIO1101		
Text:	Lecture	Biology by OpenStax (Rice University); free online or as iBook; print copy available on order: https://openstax.org/details/biology	
	Lab	“Biology II - BIO1201 Laboratory Manual” OER available as PDF at https://openlab.citytech.cuny.edu/oer-biology/labs/	
Website	https://openlab.citytech.cuny.edu/oer-biology/		
Material Needed	The following platforms/media will be used for the course: Blackboard, OpenLab, City Tech email, Zoom . The instructor will give an overview of how to use these platforms at the beginning of the term, but bear in mind that it is your responsibility to learn how to use these tools optimally, and to seek help (from the instructor or student support services) if you need further instruction.		
Course Description:	This is a continuation of the Biology I (BIO1101) course, focusing on the basic description of living organisms ranging from Prokaryotes to higher Eukaryotes. Topics covered also include animal organization and description of their main organ systems, with a particular attention to how such systems work in humans. Throughout the curriculum, interdisciplinary topics, centered around 4 major themes, “History & Scientific Discoveries”, “Biology & Industry”, “Disease Impact & Public Health Policies”, “Science & Race, Gender & Social Status”, will be discussed, providing social, historical and economical contexts and connections to biology.		
Grading Procedure (see Grading Policies for details)			
Lecture: 40%		Lab: 40%	ID Paper: 20%
Course Coordinators / Instructors			
Dr. Tatiana Voza (Biological Sciences)		Dr. Geoff Zylstra (Social Sciences)	
(718) 260-5969	tvoza@citytech.cuny.edu	gzylstra@citytech.cuny.edu	

Grading Policies

Students' performance on this course will be evaluated as follows:

Lecture: 40% of final grade, based on 4 exams, and lecture quizzes.

Lab: 40% of final grade, based on 5 quizzes, midterm and final practical exams and lab activities.

Interdisciplinary paper (ID Paper): 20% of the final grade.

STUDENTS MUST PASS (I.E. SCORE 60 OR ABOVE) BOTH COMPONENTS TO PASS THE COURSE.

ASSIGNMENTS		% OF COURSE GRADE	NOTE												
Lab	Lab quizzes count for 40% of the lab grade.	Quiz 1	3.2 %												
		Quiz 2	3.2 %												
		Quiz 3	3.2 %												
		Quiz 4	3.2 %												
		Quiz 5	3.2 %												
	Lab Activities: 10% of the lab grade	4 %	Letter grades will be determined using a standard percentage point evaluation as outlined below: A: 93-100 A-: 90-92.9 B+: 87-89.9 B: 83-86.9 B-: 80-82.9 C+: 77-79.9 C: 70-76.9 D: 60-69.9 F: Below 60												
	The 2 practical exams will be 50% of the lab grade	20 %													
Lecture	Lecture exams and paper count for 90 % of the lecture grade	Exam 1	9 %												
		Exam 2	9 %												
		Exam 3	9 %												
		Exam 4	9 %												
		Lecture Quizzes: 10% of the lecture grade	4 %	Percentage Category: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Lab Quizzes</td> <td style="text-align: right;">16 %</td> </tr> <tr> <td>Lab Activities</td> <td style="text-align: right;">4 %</td> </tr> <tr> <td>Lab Practicums</td> <td style="text-align: right;">20 %</td> </tr> <tr> <td>Lecture Exams</td> <td style="text-align: right;">36 %</td> </tr> <tr> <td>Lecture Quizzes</td> <td style="text-align: right;">4%</td> </tr> <tr> <td>ID Paper</td> <td style="text-align: right;">20 %</td> </tr> </table>	Lab Quizzes	16 %	Lab Activities	4 %	Lab Practicums	20 %	Lecture Exams	36 %	Lecture Quizzes	4%	ID Paper
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ID Paper	20 %														
ID Paper (individual or group)		20%													
TOTAL		100 %	TOTAL 100 %												

ALL GRADES ARE COUNTED; NONE ARE DROPPED NOR ARE THEY CURVED. NO MAKE-UPS ARE GIVEN EXCEPT AT THE DISCRETION OF THE INSTRUCTOR PENDING SUBMISSION OF WRITTEN PROOF OF REASON FOR ABSENCE

Academic Integrity Policy

“Academic dishonesty includes any act that is designed to obtain fraudulently, either for oneself or for someone else, academic credit, grades, or any other form of recognition that was not properly earned. Academic dishonesty encompasses the following:

Cheating: Defined as intentionally giving, receiving, using or attempting to use unauthorized materials, information, notes, study aids, including any form of unauthorized communication, in any academic exercise. It is the student’s responsibility to consult with instructors to determine whether or not a study aid or device may be used.

Plagiarism: Plagiarism is intentionally and knowingly presenting the ideas or works of another as one’s own original idea or works in any academic exercise without proper acknowledgement of the source. The purchase and submission of a term paper, essay, or other written assignment to fulfill the requirements of a course, and violates section 213-b of the State Education Law. This also applies to the submission of all or substantial portions of the same academic work previously submitted by the student or any other individual for credit at another institution, or in more than one course.

Accessibility Statement

- City Tech is committed to supporting the educational goals of enrolled students with disabilities in the areas of enrollment, academic advisement, tutoring, assistive technologies and testing accommodations. If you have or think you may have a disability, you may be eligible for reasonable accommodations or academic adjustments as provided under applicable federal, state and city laws.
- You may also request services for temporary conditions or medical issues under certain circumstances.

If you have questions about your eligibility or would like to seek accommodation services or academic adjustments, please contact the Center for Student Accessibility at 300 Jay Street room L-237, 718 260 5143 or <http://www.citytech.cuny.edu/accessibility/>.

Online Conferencing Consent

Students who participate in this class with their camera on or use a profile image are agreeing to have their video or image recorded solely for the purpose of creating a record for students enrolled in the class to refer to, including those enrolled students who are unable to attend live. If unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the “chat” feature, which allows to type questions and comments live.

Biology II (BIO1201) Learning Outcomes

Upon satisfactory completion of this course, the student will be able to:

- I. Discuss the contribution of disciplines such as Systematics and Taxonomy to the organization of living organisms. Provide criteria for classification and naming. Explain how organisms are evolutionarily related. Understand the concept of homology.
- II. Identify Prokaryotic organisms and distinguish them from Eukaryotes depending on their cellular characteristics. Provide examples of organisms belonging to the domain Bacteria and the domain Archaea. Elaborate over the contribution of bacterial infections to the development of diseases in the modern society. Explain the differences between Prokaryotes and Viruses and why viruses are not considered alive.
- III. List and explain the characteristics of the kingdom Protista and of the variety of organisms belonging to it. Provide examples of various kinds of protists and how they differ from each other in cell composition, organization and general behavior. Compare the relationships of protists with other organisms, including examples of parasitic and, generally, disease-causing organisms.
- IV. List and explain the characteristics of the Kingdom Fungi and of the organisms belonging to it. Distinguish between zygospore, ascospore and basidiospore fungi. Provide examples of the different kinds of fungi, their habitats and their survival skills.
- V. List and explain the characteristics of the kingdom Plantae and of the organisms belonging to it. Explain the concept of alternation of generations and the main differences between gametophyte and sporophyte individuals. Provide classification criteria to distinguish between different kinds of plants. Describe the differences between various plant tissues and their purpose within the plant. Analyze the main kinds of plant organs (roots, stems and leaves) and their contribution to the life cycle of plants. Describe the main steps in plants' reproduction, and the importance of the flower as the main reproductive organ in angiosperms. Distinguish between micro- and macronutrients and their importance within the life of any plant.
- VI. List and explain the characteristics of the kingdom Animalia and of the organisms belonging to it. List the various criteria for animal classification, ranging from the type of symmetry to the presence or absence of an internal body cavity. Distinguish between invertebrates and chordates.
- VII. Describe the four main kinds of animal tissues along with examples of where they can be found in humans and of the purpose they may serve. Explain the purpose of having tissues organized into organs and organs into organ systems within the human body. Present the concept of homeostasis, along with examples of how it may function in humans.
- VIII. Describe vital processes including hemolymph/blood circulation, immunity, gas exchange, food digestion and nutrient absorption, body fluid regulation, control of nervous impulses and reproduction and be able to compare and contrast features in invertebrates versus vertebrates (including humans).
- IX. Dissect and identify the main organs in a fetal pig model. List the components of each main organ system in the provided animal model, and compare them with their counterparts in humans. Dissect and identify the main components of a sheep's brain, and compare them with the corresponding structures in a human brain model.

City Tech General Education Common Core Learning Outcomes

Upon satisfactory completion of this course, the student will be able to:

1. Use Biology as a forum for the study of values, ethical principles, and the physical world.
2. Show curiosity and the desire to learn.
3. Engage in an in-depth, focused, and sustained program of study.
4. Employ scientific reasoning and logical thinking.
5. Derive meaning from experience, as well as gather information from observation.
6. Understand and employ both quantitative and qualitative analysis to describe and solve problems, both independently and cooperatively.
7. Understand and navigate systems.

8. Communicate in diverse settings and groups, using written (both reading and writing), oral (both speaking and listening), and visual means.
9. Value knowledge and learning.
10. Demonstrate intellectual honesty and personal responsibility.

CUNY Pathways Common Core Learning Outcomes

Upon satisfactory completion of this course, the student will be able to:

1. Identify and apply the fundamental concepts and methods of a life science.
2. Apply the scientific method to explore natural phenomena, including hypothesis development, observation and data presentation.
3. Use the tools of a scientific discipline to carry out collaborative laboratory investigations.
4. Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report.
5. Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data.

City Tech Interdisciplinary Course General Learning Outcomes

Upon satisfactory completion of this course, the student will be able to:

- 1. Purposefully connect and integrate across-discipline knowledge and skills to solve problems**
Throughout this curriculum, students will have to understand and apply the scientific method, reasoning and logic while also considering limitations related to technology, beliefs and social environment. Students will have to identify issues inherent to different fields when conducting scientific research. As paths and obstacles leading to biological discoveries, knowledge and applications, will be discussed, students will also be able to reflect on the importance of troubleshooting, failures and negative results in problem solving and breakthrough advances.
- 2. Synthesize and transfer knowledge across disciplinary boundaries**
Students will learn how society, religious beliefs, economics and politics can impact biology and scientific discoveries and how in turn biological advances and knowledge affect our social experience. Discussions and documents will highlight interactions between Science (and in particular Biology) and other disciplines/fields, providing context and analysis of different case studies and applications.
- 3. Comprehend factors inherent in complex problems**
This course will allow students to understand that scientific discoveries and knowledge are not obtained linearly. Different levels of complexity and limitations will be studied through discussions on topics such as the history of discoveries, the effect of religion and politics on scientists, and biases in biomedical research.
- 4. Apply integrative thinking to problem solving in ethically and socially responsible ways**
Being able to see how different aspects of life intersect is important to problem solving and social decision-making. Biology intersects with many parts of our social lives and this course will train students how to recognize these intersections and how to simultaneously think about biology and society when making decisions. Discussions about public policy as it relates to infectious disease, the corporate ownership of genetic information and the ways social categories like race and gender relate to science will enable students to use integrative thinking to make socially responsible decisions
- 5. Recognize varied perspectives**
While most people have the perception that scientists focus on finding the truth or the one best solution to a problem, twenty-first century scientists need to think in flexible ways and focus on creating multiple solutions to a problem. By introducing students to philosophers of science like Thomas Kuhn that focus on epistemology (paradigm change in the creation of scientific knowledge) students will see that scientific knowledge is variable and contended. Building on this, students will study the specific experiences of scientists from different social groups and see how social expectations play a role in the lives of scientists and the recognition of their work
- 6. Think critically, communicate effectively, and work collaboratively**
Two essay assignments, unique in a biology class, will ask students to work alone and in groups to assess both how time and place relate to scientific experimentation and how biology intersects with the rest of society.

These essays force students to think about biology and society in new ways and to communicate their thoughts in writing.

*** Description of the end of semester Interdisciplinary Essay (individual project)**

Write a 2-page essay describing how biology intersects with social aspects of human life. You can think about this paper in terms of gender, race, public policy, and business or corporate influence.

Select two of the following issues and tie them together with biology in your papers.

- Public Policy
- Race
- Gender
- Business or corporate influence

The best papers will seamlessly integrate the issues you choose with biology in cohesive paper. In other words, you are relating these different issues to each other in a seamless manner. Your paper should not read like two or three separate papers addressing each issue.

Style and Format

2 pages
Typed double spaced
12 pt Times New Roman font or equivalent
1 inch margins
Your paper must have a title (the wittier the better)
Name and section # at the top of page 1 or on the title page
Use either footnotes or parenthetical citations to cite your sources

What is an Essay?

An essay is an argumentative paper that expresses the author's point of view on a specific topic. Essays are usually both analytical as the author is judging or critiquing something, and also descriptive as the author needs to use facts to prove the accuracy of their opinion.

Structure

Introduction – A good introduction will contain (1) a catch, (2) a thesis statement, and (3) will give an indication of how the rest of the paper will be structured.

Body – This is the portion of the paper where the author makes their argument. Here the author presents information that proves the thesis of the paper. The paragraphs in the body should flow into each other.

Conclusion – The conclusion of an essay should explain how the author proved their point. In this way the conclusion is not simply a restatement of the thesis, but a blending the thesis and the body. Tell the reader how the details you discussed in the body proved the thesis in your introduction.

**** History & Scientific Discoveries Descriptive Paper (group project)**

Write a 1-page paper describing historical experiments and complications that biological researchers faced as they developed new biological knowledge. If possible consider how the concept of paradigm change discussed earlier in the semester connect with the biological research you will discuss.

Style and Format

1 page
Typed double spaced
12 pt Times New Roman font or equivalent
1 inch margins
Your paper must have a title (the wittier the better)
Name and section # at the top of page 1 or on the title page
Use either footnotes or parenthetical citations to cite your sources

What is a descriptive paper?

A descriptive paper is a paper that paints a picture of a certain object, event, situation, or issue. These types of papers leave the reader with a clear impression of something they did not know about before. A high quality descriptive paper does not only present facts, but also ties those facts to a larger theme. Better papers will connect the facts of the biological research you describe to a theme present in the relationship between biology and society.

Structure

Introduction – A good introduction will contain (1) a catch, (2) a brief description of the topic, and (3) will connect that topic to a larger theme.

Body – This is the portion of the paper where the author presents descriptive information that paints the picture you are trying to create. The paragraphs in the body should flow into each other.

Conclusion – The conclusion of a descriptive paper should briefly capture the most important part of the description and link it to the theme of the paper. In this way the conclusion is not simply a summary, but a blending the information and the theme. Tell the reader how the details you discussed in the body highlight the theme of the paper. Leave the reader with a clear impression of why the topic is important

Lecture Schedule, Quizzes and Exams and Deadlines

OpenStax Biology Textbook

Deadline	Lecture	Topics / Graded Quizzes (10%)		Exams (70%)
Wed 9/2	1	Systematics, Taxonomy, & Phylogeny		Exam 1 ID topics on Paradigms and Germ Theory of Diseases
Wed 9/9	2	Viruses, Bacteria, & Archaea		
Wed 9/16	3	Protists		
Sunday 9/20: Deadline for Exam 1				
Wed 9/23	4	Fungi		Exam 2 ID topics on Patents and Female Scientists
Wed 10/7	5	Botany: Kingdom Plantae I – Seedless Plants	One quiz for both	
	6	Botany: Kingdom Plantae II –Seed Plants		
Sunday 10/11: Deadline for Exam 2				
Wed 10/14	7	Zoology: Kingdom Animalia		Not on exam
Wed 10/21	8	Animal Organization (Tissues & Homeostasis)		Exam 3 ID topics on Blood Groups/Migrations and Public Health Policies
Wed 10/28	9	Circulatory Systems		
Wed 11/4	10	Immune Systems		
Wed 11/11	11	Digestion & Nutrition		
Sunday 11/15: Deadline for Exam 3				
Wed 11/18	12	Respiratory Systems		Exam 4 ID topics on Sex Biases in Research, Bloomberg Soda Ban and Tuskegee Syphilis Experiments
Wed 12/2	13	Excretory Systems		
Wed 12/9	14	Nervous Systems		
Wed 12/16	15	Reproductive Systems		
Sunday 12/20: Deadline for Exam 4				

Laboratory Schedule, Lab Activities and Exams Deadlines

“Biology II - BIO1201 Laboratory Manual” OER by T. Voza - <https://openlab.citytech.cuny.edu/oer-biology/labs/>

Deadline	LAB #	EXERCISES/ Graded Activities (10%)	Quizzes (20%)	Practicals (50%)	
Wed 9/2	I	Systematics, Taxonomy, & Phylogeny	Quiz 1	Midterm Practical	
Wed 9/9	II	Introduction to Microbiology: Prokaryotes & Protists			
Sunday 9/13: Deadline for Lab Quiz 1					
Wed 9/16	III	Introduction to Mycology: Kingdom Fungi	Quiz 2		
Wed 9/30	IV	Botany: Kingdom Plantae I – Bryophytes, Ferns			
Wed 10/7	V	Botany: Kingdom Plantae II – Gymnosperms, Angiosperms			
Sunday 10/11: Deadline for Lab Quiz 2					
Wed 10/14	VI	Zoology: Kingdom Animalia I - Lower Invertebrates	Quiz 3		
Wed 10/21	VII	Zoology: Kingdom Animalia II - Lower Invertebrates			
Wed 10/28	VIII	Kingdom Animalia III – Arthropods & Chordates			
Sunday 11/1: Deadline for Lab Quiz 3 and Midterm Practical					
Wed 11/4	IX	Vertebrate Organization – Tissues & Organs	Quiz 4	Final Practical	
Wed 11/11	X/XI	Vertebrate Anatomy I – Fetal Pig Dissection			
Wed 11/18	X/XI	Vertebrate Anatomy II – Fetal Pig Urogenital System			
Sunday 11/22: Deadline for Lab Quiz 4					
Wed 12/2	XII	Vertebrate Anatomy III – Organs of Homeostasis - Urinalysis	Quiz 5		
Wed 12/9	XIII	The Nervous System - Sheep Brain			
Wed 12/16	XIV	Reproduction & Development			
Sunday 12/20: Deadline for Lab Quiz 3 and Final Practical					

ID Discussions Schedule

Date / Time	ID Component	ID Material
Tue 9/1 4-5 pm	History & Scientific Discoveries: Evolution vs Politics or Religion	<ul style="list-style-type: none"> • Linnaeus & Kuhn and paradigmatic shifts • Excerpt from <i>The Structure of Scientific Revolutions</i> by T. Kuhn
Tue 9/8 4-5 pm	History & Scientific Discoveries: Beliefs & Proofs	Miasma and Germ Theory of Disease
Tue 9/22 4-5 pm	Biology & Industry: Ethnobotany & Pharmaceutics	<ul style="list-style-type: none"> • Patents and Neem Oil • “Granting Community Theft.” By J. Vidal in <i>The Guardian</i> 9/8/2003 http://www.theguardian.com/environment/2003/sep/08/wto.fairtrade3
Tue 10/6 4-5 pm	Science & Race, Gender, Social Status	<ul style="list-style-type: none"> • Women in Science: • Female Biologists Biographies: <ul style="list-style-type: none"> - Rachel Carson - Barbara McClintock - Rosalind Franklin
Tue 10/20 4-5 pm	Science & Race, Gender, Social Status	<ul style="list-style-type: none"> • HeLa cells history • Excerpts from <i>The Immortal life of Henrietta Lacks</i> by R. Skloots • Podcast: How HeLa Cells Work (http://www.stuffyoushouldknow.com/podcasts/hela-cells-work/)
Tue 10/27 4-5 pm	History & Scientific Discoveries: Failures and Luck	Blood Groups and human migrations
Tue 11/3 4-5 pm	Diseases Impact & Public Health Policies	<ul style="list-style-type: none"> • Emergency Public Health Policies • CDC website visit
Tue 11/17 4-5 pm	Science & Race, Gender, Social Status	<ul style="list-style-type: none"> • Experimental Designs and Translational Medicine • Selection of articles on sex bias in translational medicine
Tue 12/1 4-5 pm	Diseases Impact & Public Health Policies	<ul style="list-style-type: none"> • Bloomberg & Soda Ban • Public Health Law Center doc: Taxing Sugar Drinks: A Tool for Obesity Prevention, Cost Saving & Health Improvement (http://publichealthlawcenter.org)
Tue 12/8 4-5 pm	Science & Race, Gender, Social Status	<ul style="list-style-type: none"> • Tuskegee Syphilis Experiments • Website: U.S. Public Health Service Syphilis Study at Tuskegee