


“OUR BIOLOGICAL SELVES”

INTERDISCIPLINARY BIOLOGY II (BIO1201 & BIO1201L)

SYLLABUS

		NEW YORK CITY COLLEGE OF TECHNOLOGY The City University Of New York		School of Arts and Sciences Department of Biological Sciences	
Course Information					
Course title:		Biology II (Lecture and Laboratory)			
Course code:		BIO1201 and BIO1201L			
Credit Hours:		4 credit hours	3 hours lecture and 3 hours lab per week for 15 weeks		
Prerequisite:		BIO1101			
Text:	Lecture	“BIOLOGY” by S. Mader& Windelspecht 12 th Ed., McGraw Hill ISBN: NYCCT half volume: 1259710572 OR ISBN: Full eTextbook for two semesters: 1259299813 Available as eBooks			
	Lab	“General Biology II Laboratory Manual” (customized) by T. Voza & M. Montes-Matias, McGraw Hill Publishers. ISBN: 9781121957886 eBook available at http://create.mcgraw-hill.com/shop/			
Material		Lab coat, disposable gloves and dissecting kit			
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.			
Grading Procedure (see Grading Policies for details)					
Lecture: 60%			Lab: 40%		
The Lecture component will include <u>at least</u> 4 exams plus other assignments at the discretion of the Instructor. The Lab component will include <u>at least</u> 5 quizzes and a fetal pig practical dissection.					
Course Coordinators / Instructors					
Dr. Tatiana Voza			Dr. Geoff Zylstra		
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Course Description

BIO1201 is the second half of First Year General Biology for non-science majors at New York City College of Technology. This course comes with a lecture and a lab component. The course introduces the student to a variety of biological topics fundamental to all living organisms, with a focus on human organ systems. In particular, the course is a survey of organisms belonging to the Domains Archaea and Bacteria and, more extensively, the groups spanning the four kingdoms of the Domain Eukarya. A special focus will be dedicated to higher animal organization, ranging from animal tissues to organs and organ systems, and how these systems compare and contrast among other vertebrates and invertebrates. 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 Policies

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

Lecture: 60% of final grade (based on at least 4 exams)

Lab: 40% of final grade, based on 5 quizzes (75% overall) and fetal pig practical (25% overall)

ASSIGNMENTS			POINTS	NOTE	
Lab Quizzes	There are 5 quizzes, which will account for 75% of the final lab grade.	Quiz 1	5%	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	
		Quiz 2	5%		
		Quiz 3	5%		
		Quiz 4	5%		
		Quiz 5	5%		
		Group Paper**	5%		
	The final practical will be 25% of the final lab grade		10%		
Lecture Exam	Exam 1		12%	Percentage Category:	
	Exam 2		12%	Exams/Final Paper	60%
	Exam 3		12%	Quizzes	30%
	Exam 4		12%	Practical	10%
	Final project ID Essay*		12%	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

Attendance and Lateness

You must attend both lecture and lab. **ABSENCES IN EXCESS OF 10% OF THE TOTAL LECTURE OR LAB HOURS WILL RESULT IN YOUR BEING DROPPED FROM THE COURSE WITH A FAILING GRADE.** This means that no more than 3 lecture or 2 lab absences will be tolerated. It is expected that you will be in your seat and ready to work at the start of each period. Any 2 latenesses will be considered to be equal to 1 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.

*** 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

Chapters are indicated for the 12th Edition of “BIOLOGY” by S. Mader McGraw Hill Publishers

	Topics	Textbook Pages	ID Component	ID Material	ID Assessment
Week 1	Classification of Living Organisms <ul style="list-style-type: none"> Taxonomy: classification and naming of living organisms Systematic and evolutionary relationship between organisms Classification systems: Domains and Kingdoms 	Chap. 19 337-351	History & Scientific Discoveries: Evolution vs Politics or Religion	<ul style="list-style-type: none"> 20 min discussion on Linnaeus & Kuhn and paradigmatic shifts Excerpt from <i>The Structure of Scientific Revolutions</i> by T. Kuhn excerpt BBC documentary on Darwin’s life and struggles (http://dai.ly/xsxbk) 	6 MCQ Exam 1
Week 2	Viruses, Bacteria and Archaea <ul style="list-style-type: none"> The Viruses: viral structure, viral reproduction, viral infections The Domain Bacteria: structure, reproduction, nutrition The Domain Archaea: structure and function, types of archaea 	Chap. 20 362-382			
Week 3	The Protists <ul style="list-style-type: none"> Ecological Importance The Algae: green, red, brown, diatoms Euglenoids Protists with pseudopods The Ciliates, the Sporozoans and the Slime molds 	Chap. 21 373-394	Biology & Industry: Protistology and Food	<ul style="list-style-type: none"> 20 min presentation of commercial uses for protists in food In class food labels analysis 	6 MCQ Exam 1
Week 4	EXAM 1 (Classification, Viruses, Bacteria & Archaea and Protists)				
	The Fungi <ul style="list-style-type: none"> Characteristics and structure of Fungi Reproduction of Fungi Classification of Fungi: Chytridiomycota, Zygomycota, Ascomycota, Basidiomycota Symbiotic Relationships of Fungi: lichens, mycorrhizae 	Chap. 22 395-409			

Week 5	Evolution and Diversity of Plants <ul style="list-style-type: none"> Vascular and non-vascular plants Plants with and without seeds Gymnosperms and Angiosperms Plant organs: roots, stems, leaves Monocot and eudicot plants Plant tissues: epidermal tissue, ground tissue, vascular tissue 	Chap. 23&24 411-455	Biology & Industry: Ethnobotany & Pharmaceutics	<ul style="list-style-type: none"> 20 min discussion on Patents and Neem Oil Textbook insert on p435 on Neem plants “Granting Community Theft.” By J. Vidal in <i>The Guardian</i> 9/8/2003 http://www.theguardian.com/environment/2003/sep/08/wto.fairtrade3 	6 MCQ Exam 2
Week 6	Nutrition and Transport & Reproduction in plants <ul style="list-style-type: none"> Essential inorganic nutrients (macro- and micro-nutrients) Soil: soil formation, nutritional function of soil, soil particles and soil erosion Water and mineral uptake Plant reproductive strategies Seed development 	Chap. 25 456-475 Chap. 27 495 -511			
Week 7	EXAM 2 (The Fungi and Plants: Evolution, Diversity, Nutrition, Transport and Reproduction)				
	Kingdom Animalia: Invertebrates & Vertebrate Chordates <ul style="list-style-type: none"> Introduction to invertebrates: level of organization, type of symmetry, type of coelom, segmentation and multicellularity Protostomes & Deuterostomes 	Chap. 28 & 29 513-563			
Week 8	Animal Organization and Homeostasis: <ul style="list-style-type: none"> Types of tissue: epithelial, connective, muscular, and nervous Organs and organ systems Homeostasis: negative and positive feedback 	Chap. 31 580-599	Science & Race, Gender, Social Status	<ul style="list-style-type: none"> 15 min discussion on the 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/) 	6 MCQ Exam 3
Week 9	Circulation <ul style="list-style-type: none"> Circulation in invertebrates Circulation in vertebrates Blood as a transport medium 	Chap. 32 600-620			

Week 10	Lymph Transport and Immunity <ul style="list-style-type: none"> The lymphatic system The immune system: specific and non-specific defenses Antibodies and types of immunity 	Chap. 33 621-640	Diseases Impact & Public Health Policies	<ul style="list-style-type: none"> 15 min discussion centered on articles on Ebola and Emergency Public Health Policies CDC website visit Online article from The Freeman Spogli Institute (FSI) (https://shar.es/1vbKu5) 	6 MCQ Exam 3
Week 11	EXAM 3 (Kingdom Animalia and Animal Organization & Homeostasis, Circulation, Lymphatic System)				
	Digestion and Nutrition <ul style="list-style-type: none"> Digestive tracts: incomplete and complete; continuous and discontinuous Adaptation to diet Human digestive tract 	Chap. 34 641-658	Diseases Impact & Public Health Policies	<ul style="list-style-type: none"> 20 min discussion on Bloomberg and sodas Public Health Law Center pdf doc: Taxing Sugar Drinks: A Tool for Obesity Prevention, Cost Saving and Health Improvement (http://publichealthlawcenter.org) 	6 MCQ Exam 4
Week 12	Respiration <ul style="list-style-type: none"> Gas exchange Water and land environments Human respiratory system 	Chap. 35 659-676			
Week 13	Body Fluid Regulation and Excretion <ul style="list-style-type: none"> Aquatic animals and Terrestrial animals Waste products: urea, uric acid Organs of excretion Human urinary system 	Chap. 36 677-690			
Week 14	Nervous System and Sense Organs <ul style="list-style-type: none"> Invertebrate nervous organization Vertebrate nervous organization Human nervous system: central and peripheral Chemical senses (taste and smell) and Sense of vision 	Chap. 37 691-713			
Week 15	Reproduction <ul style="list-style-type: none"> Asexual reproduction Sexual reproduction Male and female reproductive system Hormones of reproductive system 	Chap. 41 770-792	Science & Race, Gender, Social Status	<ul style="list-style-type: none"> 20 min discussion Tuskegee Syphilis Experiments Website: U.S. Public Health Service Syphilis Study at Tuskegee 	6 MCQ Exam 4
	EXAM 4 - FINAL (Digestion -Nutrition, Respiration, Excretion, Nervous System & Reproduction) Submission deadline for the Interdisciplinary Theme Essay *				

Laboratory Schedule

Page are indicated for “General Biology II Laboratory Manual” by T. Voza, & M. Montes-Matias, McGraw Hill Publishers

	Topics	Pages	ID Component	ID Material	ID Assessment
Week 1	Taxonomy: Classification and Naming of Living Organisms <ul style="list-style-type: none">List the taxonomic levels from the broadest to the most specific.Explain the degree of similarity and difference between organisms classified in a taxonomic table.Identify animals and plants through the use of a dichotomous key.	2-14			
Week 2	Domain Bacteria and Domain Archaea, Kingdom Protista <ul style="list-style-type: none">Describe the distinguishing features of members of the Domain Bacteria.Describe differences between bacteria and cyanobacteria.Discuss the distinctive features of each group of algae and protozoans.List examples, habitats, reproductive methods, and unique features of representative members of the Kingdom Protista.	15-32	History & Scientific Discoveries: Beliefs & Proofs	• 15 min discussion on the Miasma and Germ Theory of Disease	5 MCQ Quiz 1
Week 3	Quiz 1(Taxonomy, Bacteria, Archaea and Protists)				
	Kingdom Fungi <ul style="list-style-type: none">Describe the characteristic features of Kingdom Fungi.Explain the division names: Zygomycota, Ascomycota, Basidiomycota.Discuss variations in structure and the sequence of events for sexual reproduction for the three major divisions of the Kingdom Fungi.	33-46	Biology & Industry: Mycology and Pharmaceuticals	• 15 min discussion on drugs and diseases linked to fungi • Cases studies (articles) • Discovery history of statins, antibiotics (articles)	5 MCQ Quiz 2
Week 4	Kingdom Plantae I – Bryophytes, Ferns & Gymnosperms <ul style="list-style-type: none">Describe the process of alternation of generations.Explain the criteria for plants classification: conducting tissue, seeds and flowers and distinctive evolutionary featuresDiscuss similarities and differences between ferns and bryophytes.Describe the life cycles of ferns and their allies.Describe the life cycle of a pine tree (gymnosperm)	47-57	Science & Race, Gender, Social Status	• 15 min discussion on Women in Science: • Female Biologists Biographies: - Barbara McClintock. Genetics and Chromosomes of plants. Theories were not accepted until later developments proved her correct. - Rosalind Franklin. DNA structure. Influenced Crick and Watson.	5 MCQ Quiz 2
Week 5	Kingdom Plantae II – Angiosperms: Plant Form & Function <ul style="list-style-type: none">Describe the life cycle of flowering plants (angiosperms)List and give the functions of the principal parts of a flower.Describe the structure and function of roots, stems, and leaves.	54-79			

Week 6	Quiz 2 (Fungi & Plants)				
	Kingdom Animalia I - Lower Invertebrates <ul style="list-style-type: none"> Describe the distinguishing features of members of the phylum Porifera and the phylum Cnidaria. Describe the body forms of cnidarians. Compare the feeding methods of sponges and jellyfish. 	81-89			
Week 7	Kingdom Animalia II - Lower Invertebrates (continued) <ul style="list-style-type: none"> Describe the general morphology of flatworms (phylum Platyhelminthes). Describe the general morphology, major classes and advanced characteristics of roundworms (phylum Nematoda). Describe the general morphology of organisms of phylum Annelida and phylum Mollusca. List the characteristics and major classes of the phyla Annelida, Mollusca, Platyhelminthes and Nematoda. 	90-112			
Week 8	Kingdom Animalia III – Arthropods and Chordates <ul style="list-style-type: none"> Describe the general morphology, characteristics and major classes of phylum Arthropoda. Describe modifications of the exoskeleton and paired appendages of arthropods. Describe the morphology, characteristics of the phylum Chordata. Discuss embryological characteristics that distinguish protostomes from deuterostomes. 	113-142	Science & Race, Gender, Social Status	<ul style="list-style-type: none"> 15 min discussion on Experimental Designs and Translational Medicine Selection of articles on sex bias in translational medicine 	5 MCQ Quiz 3
Week 9	Quiz 3 (Animals)				
	Vertebrate Organization – Tissues and Organs <ul style="list-style-type: none"> Describe the general properties of tissues versus single cells Describe the characteristics of epithelial, connective, muscular and nervous tissues Describe the organization of the skin as an organ made of several tissues working together 	143-158	History & Scientific Discoveries: Failures and Misapps	<ul style="list-style-type: none"> 5 minute discussion on Blood Groups Podcast: What's the deal with Blood Types (1hr 2min) https://itunes.apple.com/us/podcast/whats-deal-blood-types/id278981407?i=339613425&mt=2 	One page paper (Group project) **
Week 10	Vertebrate Anatomy I – Fetal Pig Dissection <ul style="list-style-type: none"> Understand the classification of the pig as a mammal; name the unique mammalian characteristics represented by the fetal pig. Define all the anatomical terminology, planes and structures Dissect and identify the components of the digestive system of the 	159-170			

	fetal pig <ul style="list-style-type: none"> Dissect and identify the components of the respiratory system of the fetal pig 				
Week 11	Vertebrate Anatomy II – Fetal Pig Urogenital System <ul style="list-style-type: none"> Determine the sex of your pig Define, identify, describe components of the urogenital system of the fetal pig. Dissect and identify the heart of the fetal pig along with the main blood vessels (aorta, vena cava) 	170-174 214-217			
Week 12	Quiz 4 (Vertebrate Anatomy: Tissues, Organs and Organ Systems)				
	Vertebrate Anatomy III – Organs of Homeostasis <ul style="list-style-type: none"> Define homeostasis and why it is an important characteristic of every life form Describe the structure and function of the human lungs, liver and kidneys and their role in the maintenance of homeostasis Describe the process of urine formation in the human kidney Explain and discuss negative and positive feedback mechanisms. 	175-192			
Week 13	The Nervous System - Sheep Brain - Sensory Organs <ul style="list-style-type: none"> Define and describe the components of the central and peripheral nervous systems Dissect and identify the components of the sheep brain and their human counterparts on the models available; provide a function for each component Describe the structure of the spinal cord and the mechanism underlying reflexes Describe the structure of the human ear and eye and the function associated to their components 	193-212			
Week 14	Quiz 5 (Physiology: Homeostasis, Organ functions and Nervous System) Submission deadline for one page description paper * on “History & Scientific Discoveries”				
	Embryological Development <ul style="list-style-type: none"> Describe the main steps in the embryological development of vertebrates Identify the various stages in the developmental models provided Review the concepts previously learned on vertebrate anatomy 	213-228			
Week 15	Final: Fetal Pig/Brain Practicum				