

Biology 1102: Introduction to Biology B

Summer 2022

Lecture: MTWRF 10:15 AM – Noon Section 910

Recitation: Immediately Following Lecture on Mondays and Wednesdays
[Last 20+ minutes of scheduled lecture time]

Lab: TR 1:45 – 4:45 PM Section 911
TR 1:45 – 4:45 PM Section 912

Welcome to Biology 1102 Summer Session I 2022!

Through in person lectures and problem solving sessions you will be learning general principles of biology. This course will be focusing on evolutionary principles, common adaptations of diverse organisms to the challenges of living on planet earth, and basic principles of ecology. We will also try to foster your biological curiosity, critical reading skills and application of biological principles to current world problems.

Course Objectives

Our goal is to impart to you the tools to be biologically competent so that you can understand the world around you better and be able to pursue more specialized biology courses in the future.

By the end of this course, you should be able to:

- Understand the forces that drive evolution of new species
 - Comprehend that the unit of evolution is the individual organism, but the net outcome of evolutionary forces is measured in populations of organisms
 - Understand how natural selection and other mechanisms of evolution work
 - Understand the biological concept of a species
- Appreciate that all cellular and multicellular organisms on this planet face the same challenges in staying alive
- Understand homeostasis in uni- and multi-cellular organisms
- Appreciate that both aquatic and terrestrial organisms need to maintain a specific concentration of solutes within their cells and in multicellular organisms outside of their cells also.
 - Understand the mechanisms that different organisms have evolved to maintain osmotic homeostasis
- Understand the multiple structures and systems that have evolved to allow organisms to exchange oxygen and carbon dioxide with the atmosphere
- Understand how different organisms have evolved mechanisms to rid themselves of nitrogenous wastes and still maintain their osmolarity
- Describe how multicellular organisms synchronize tissue and organ responses through both chemical and electrical signaling mechanisms
- Understand the role of internal vasculature in gas exchange, nutrition, osmoregulation, and chemical communication in different multicellular organisms
- Understand the mechanisms that have evolved to protect organisms from disease
 - Distinguish between innate and adaptive immune systems and mechanisms
- Understand the levels of biological organization from individual to the biosphere
- Understand how both abiotic and biotic components drive the composition of each level
- Understand the broad ecological principles that apply to several levels of biological organization

Distribution of work for the entire course

Weekly exams [Best 4 of 5 exams]	34%
Comprehensive final exam	13%
Participation	10%
Graded assignments [9 in total]	10%
Lab Assignments [Detailed in Lab syllabus]	33%
	100%

Instructor Contact and Availability

Dr. John Zimmerman

johnezz@sas.upenn.edu

Recitation on MW immediately following lecture.

Office hours will be on Wednesdays and Fridays from 12:30 PM to 1:30 PM.

Use Your Resources for Succeeding in Biol 1102. The course covers a great deal of material in a short time! The most important strategy for success is to keep up with the work on a regular basis. For example, it is very useful to go over your lecture notes sometime later the same day in order to consolidate your learning and to clarify your lecture notes while the material is still fresh in your mind. In addition, as you review the material, formulate questions to ask during recitation sessions following lecture or during office hours. The optional recitations are your easiest access to and an excellent resource for additional help for this course. It's a regular chance to ask questions, hear discussions of difficult topics and other students' questions and ideas, and review old exam questions. If you encounter difficulties, feel free to see me during the multiple office hours [Dr. Zimmerman]; don't be shy! I'm here to help with the subject matter or for advice that you might need; you can also turn to your TA if you feel more comfortable.

Please contact me outside of lecture, recitation, or office hour, via email johnezz@sas.upenn.edu with any issues about the course or to set up a zoom session. I will respond within 24 hours or sooner depending on the issue. Be aware any emails sent after 10 PM are likely not be responded to before 9 AM the next day.

[Canvas Student Guide](#) is the place to start with any Canvas related issues.

Biology 1102 Canvas Site

The Canvas site will be your first choice in staying informed on both lecture and laboratory course information. Make sure to check announcements frequently and that your email settings allow announcements from Canvas be received to your inbox.

Text

"How Life Works" 3rd edition Morris et al editors.

Purchasing the textbook through the Penn bookstore (or several other retailers) will give you an access code to setup a LaunchPad account. This is an online environment created by the publishers which some institutions use for in-person courses. THIS COURSE WILL ONLY BE USNG THE BILOGY 101 CANVAS SITE FOR ASSIGMENTS, QUIZZES, GRADING, ETC. NOT LAUNCHPAD. There are, however, review exercises and other aspects of the LaunchPad environment you may find useful

Academic Integrity

Every member of the University community is responsible for always upholding the highest standards of honesty. Students, as members of the community, are also responsible for adhering to the principles and spirit of the Penn Code of Academic Integrity. More details about this policy can be found online at [University of Pennsylvania Code of Academic Integrity](#).

Scientific research is a collaborative process and we encourage the formation of online study groups and other collaborative team-based learning strategies.

However, for any written assignments you must follow the code of academic integrity. Students are prohibited from **“copying another person’s paper, article, or computer work and submitting it for an assignment”**. We will be using Turnitin on Canvas to screen for plagiarism.

University Services

[Student Disability Services \(SDS\)](#): The self-identification process is confidential and completely voluntary. However, instructors must receive official notification from SDS for those requesting

Date	Subject	Reading	Assignments & Exams
June 30	Course Introduction Overview of Evolution & Causes of Variation	1.4, 14.1 20.1-20.4	
July 1	Modes of Natural Selection Genetic Drift	20.1-20.5	Exam 01
July 4	Independence Day – No Class No Assignments		
July 5	Genetic Mutation Gene Flow & Migration	14.2, 14.3, 20.4	
July 6	Molecular Evolution, Variation, Evolution of Genes and Genomes	15.1-15.3, 20.6 Ch. 18	Assignment 01
July 7	Traits & Understanding Phylogenetic Trees	17.4, 22.1, 22.2	
July 8	Classification and Mechanisms of Speciation	Ch. 21	Exam 02
July 11	Characteristics and Definition of Life Major Events & Patterns on Earth	13.5, 22.3, 22.4	Assignment 02
July 12	Microbial Life and its Origins	Ch. 25, 26.1, 26.2, Ch. 27,	
July 13	Macrobian Life and the Three Domains	28.1, 32.1, 33.3, Ch. 43	Assignment 03
July 14	Evo-Devo Toolkit, Deep Homology, Homeotic Genes & Development	Ch. 19	
July 15	Size, Scale, and Temperature Homeostasis, Integration, and Adaptation	33.3	Exam 03
July 18	Water Balance at the Macroscopic Level	27.3-27.5 Ch. 39	Assignment 04
July 19	Energetics: Fundamentals & Thermodynamics	Ch. 6-8 [review] 38.1	
July 20	Nutritional Requirements and Organismal Strategies	38.2 - 38.4	Assignment 05
July 21	Gas exchange in multicellular organism	37.1-37.3	
July 22	Vascular systems in multicellular organisms	37.4-37.5	Exam 04

July 25	Chemical Signaling	Ch. 36	Assignment 06
July 26	Electrical Signaling	Ch. 34	
July 27	Muscles	Ch. 35	Assignment 07
July 28	Innate Immunity Adaptive Immunity	Ch. 41	
July 29	Why Ecology? The Four Processes and Modelling Populations	Ch. 44	Exam 05
August 1	Dispersal Reproductive Strategies		Assignment 08
August 2	Predation, Parasitism, and Mutualism	45.1 - 45.3	
August 3	Diversity, Productivity, and Community Structure	Ch. 46	Assignment 09
August 4	Energy Flow, Cycles, and Human-Associated Pattern	Ch. 48	
August 5	Comprehensive Exam – No Lecture		