JOHNS HOPKINS
SCHOOL of NURSING

COURSE NUMBER AND TITLE

NR.110.208 Introduction to Biology with Lab

CREDITS

4 credits

PRE- AND COREQUISITES

None

COURSE DESCRIPTION

Biology with Lab is an introduction to the core concepts of the biological sciences. Over the course of 10 weeks, the learner will develop a foundational understanding of the molecular, cellular, and evolutionary principles that comprise biology and will have the opportunity to apply them in the lab portion of the course. Concepts covered include evolution, genetics, cellular structure and function, plant and animal structure and function, and ecology. This provides the foundations of biology required for more advanced science pre-requisite courses.

OBJECTIVES

The course objectives are organized in line with the program outcomes. At the end of the course, the student will be able to:

1. Describe how evolution contributes to the variety and commonality of living organisms.
2. Explain how biological systems harness energy and molecular components to support growth, development, and reproduction.
3. Explain the genetic basis of life including how information is stored, transmitted, and translated into proteins.
4. Perform common laboratory techniques, their indications, and basic interpretation of their results.

REQUIRED TEXTBOOKS AND OTHER COURSE MATERIALS

Textbook (included with Pearson+):
Urry, L., Cain, M., Wasserman, S., Minorsky, P., & Orr, R. (2020). *Campbell Biology (12th ed.)*. Pearson.

Access to Pearson+: Students must purchase access code to Pearson+ in order to access the assessment items and other learning materials for this course. Please do not purchase from any 3rd party vendor before reviewing the information presented in the Canvas course site.

Access to a reliable computer and internet connection: It is recommended that students have a recent operating system. We also recommend that you use the most updated version of either Mozilla Firefox or Google Chrome as your web browser for this course. Other operating systems and web browsers may not be fully supported by the Canvas or Pearson +. Please see the Canvas course site and for detailed system requirements.

SUMMARY OF LEARNING ASSESSMENTS/ASSIGNMENTS

LEARNING ASSESSMENT/ ASSIGNMENT	COURSE OBJECTIVES ADDRESSED	WEIGHT TOWARD FINAL COURSE GRADE	DUE DATE
Prerequisite Program Compliance	N/A	5%	Module 1
Module Quizzes, 10 quizzes in total	All	25%	Monday 11:59 PM ET; See course syllabus for dates
Lab Assignments, 8 labs in total	All	20%	Monday 11:59 PM ET; See course syllabus for dates
Midterm Exam	All	25%	Module 5
Final Exam	All	25%	Module 10

LEARNING ASSESSMENTS/ASSIGNMENTS

Quizzes

At the end of each module there is a timed, multiple-choice quiz designed to test your mastery of the material covered in the module. The quizzes are open book and open notes but must be completed independently. One attempt is allowed for each quiz. There are ten graded quizzes in total in this course. You will find these quizzes under the “Assessment” section of each module.

Labs

Interactive laboratory sessions are performed through Pearson+. The labs are designed to reinforce your understanding of the learning material in each module through real-world scenarios. There are eight labs in total.

Exams

There are two comprehensive, timed, multiple-choice exams. The Midterm Exam tests your mastery of material from Modules 1-5 and the Final Exam tests your mastery of material from Modules 6-10. The exams are open book and open notes but must be completed independently.

GRADING SCALE

RANGE	LETTER GRADE	GRADE POINT
97 – 100	A+	4.0
93 – 96	A	4.0
90 – 92	A-	3.7
87 – 89	B+	3.3
83 – 86	B	3.0
80 – 82	B-	2.7
77 – 79	C+	2.3
73 – 76	C	2.0
70 – 72	C-	1.7
67 – 69	D+	1.3
63 – 66	D	1.0
60 – 62	D-	0.7
<60	F	0

ACADEMIC POLICIES

For a full list of academic policies, please see the current academic catalog and handbook.

COURSE POLICIES

The course is asynchronous, and students may work ahead. All course assignments must be turned in by the specified due date and time. Once the due date and time have passed, 10% of the total points you have earned on the assignment will be deducted per day (per 24 hour period). **There are no makeup or extra credit assignments allowed, and assignments submitted more than 10 days late will not receive credit.** Please contact the course instructor prior to the due date in the case of extenuating circumstances.

COMMUNICATION POLICY

Students may communicate with the instructor by email, which is provided in the Contact Information area. The instructor will respond to students within 48 hours. Assignment feedback will be provided to students within two weeks of submission.

All official communication, notices, & announcements will be distributed through student JHU-SON e-mail accounts via Canvas. The student is accountable for checking this

account regularly and for all course communication sent to it.

Students are responsible for reading “Netiquette” which is located under Syllabus & Course Info on the Canvas site. Netiquette provides simple guidelines for civil on-line discourse & behavior, that participants are to follow and expect of one another.

HONOR CODE

Students enrolled in the Johns Hopkins University School of Nursing are expected to conduct themselves in a manner that upholds the values of this institution of higher education. Each student is obligated to refrain from violating academic ethics and maintaining high standards of conduct. In addition, the School of Nursing upholds the professional code of ethics established in the Code of Ethics for Nurses (ANA, 2015). Each student is held accountable for adhering to the American Nurses Association Code of Ethics. For the full Johns Hopkins School of Nursing Honor code, please see the current academic catalog and handbook.

EXAM INTEGRITY & STUDENT IDENTITY VERIFICATION

This course may require the use of technology and/or software to ensure exam integrity and verify the identity of the student taking the exam. Additional information and directions will be provided in the course website.

DISABILITY SERVICES

If you have a disability and may require accommodation in this course, please contact the *Office of Student Affairs* at (410) 955-7545 or SON-DSS@jhu.edu to discuss your specific needs.

COURSE SCHEDULE

Module	Module Subtopics	Learning Activities, Formative Assessment & Resources	Evaluative Assessment
Welcome – Start Here Prior to *Module 1*	• Getting Started	Familiarize yourself with Canvas and Pearson+	Discussion Board: Introduce Yourself Prerequisite Program Compliance Modules **Due: Prior to Module 1** Dates vary by term, see course syllabus
Module 1: Overview of Biology and Scientific Inquiry	• The themes of biology • Evolution • The scientific method	*Campbell Biology*(12th Edition), Chapter 1: Evolution, the Themes of Biology, and Scientific Inquiry Review the lecture materials posted in the module for this week.	Module 1 Lab: The Scientific Method: Hand Soap vs Hand Sanitizer Module 1 Quiz **Due: Monday, 11:59 p.m. ET;** Dates vary by term, see course syllabus
Module 2: Introduction to the Molecules of Life	• Carbohydrates • Proteins • Nucleic acids • Lipids	*Campbell Biology*(12th Edition), Chapter 5: The Structure and Function of Large Biological Molecules Review the lecture materials posted in the module for this week.	Module 2 Lab: Protein Structure and Function Module 2 Quiz **Due: Monday, 11:59 p.m. ET;** Dates vary by term, see course syllabus
Module 3: Introduction to Cellular Biology	• Eukaryotic and prokaryotic cell classification • Cellular structure • Microscopy	*Campbell Biology*(12th Edition), Chapter 6: A Tour of the Cell Review the lecture materials posted in the module for this week.	Module 3 Lab: Microscopy, Tools of Science Module 3 Quiz **Due: Monday, 11:59 p.m. ET;** Dates vary by term, see course syllabus

Module	Module Subtopics	Learning Activities, Formative Assessment & Resources	Evaluative Assessment
Module 4: Introduction to Metabolism	• Laws of thermodynamics • Free energy • Exergonic and endergonic reactions	*Campbell Biology*(12th Edition), Chapter 8: An Introduction to Metabolism Review the lecture materials posted in the module for this week.	Module 4 Lab: Photosynthesis: Photons Fuel Plants Module 4 Quiz **Due: Monday, 11:59 p.m. ET;** Dates vary by term, see course syllabus
Module 5: The Cell Cycle	• DNA packaging • Mitosis • Binary fission	*Campbell Biology*(12th Edition), Chapter 12: The Cell Cycle Review the lecture materials posted in the module for this week.	Module 5 Quiz **Due: Monday, 11:59 p.m. ET;** Dates vary by term, see course syllabus ***Note that there is no lab assignment due this week-take this time to prepare for the exam**
Exam 1 (During Module 5)	None	Review content in Module 1 through Module 5	**Due: Monday, 11:59 p.m. ET;** Dates vary by term, see course syllabus
Module 6: Genetics: Mendel and the Gene Idea	• Laws of inheritance • Punnett square • Genotype and phenotype	*Campbell Biology*(12th Edition), Chapter 14: Mendel and the Gene Idea Review the lecture materials posted in the module for this week.	Module 6 Lab: Genetics Module 6 Quiz **Due: Monday, 11:59 p.m. ET;** Dates vary by term, see course syllabus
Module 7: The Molecular Basis of Inheritance	• DNA structure • DNA replication and repair • Gene structure	*Campbell Biology*(12th Edition), Chapter 16: The Molecular Basis of Inheritance Review the lecture materials posted in the module for this week.	Module 7 Lab: Building DNA Module 7 Quiz **Due: Monday, 11:59 p.m. ET;** Dates vary by term, see course syllabus
Module 8: Gene Expression: From	• Transcription	*Campbell Biology*(12th Edition), Chapter 17: Gene Expression:	Module 8 Lab: Central Dogma and Genetic Medicine

Module	Module Subtopics	Learning Activities, Formative Assessment & Resources	Evaluative Assessment
Gene to Protein	• Translation • RNA structure • Genetic mutations	From Gene to Protein Review the lecture materials posted in the module for this week.	Module 8 Quiz **Due: Monday, 11:59 p.m. ET;** Dates vary by term, see course syllabus
Module 9: Descent with Modification	• Natural selection • Darwin • Evolution	*Campbell Biology*(12th Edition), Chapter 22: Descent with Modification Review the lecture materials posted in the module for this week.	Module 9 Lab: Natural Selection Module 9 Quiz **Due: Monday, 11:59 p.m. ET;** Dates vary by term, see course syllabus
Module 10: The History of Life on Earth	• Origin of life • Fossil record • Speciation and extinction • Evolution	*Campbell Biology*(12th Edition), Chapter 25: The History of Life on Earth Review the lecture materials posted in the module for this week.	Module 10 Quiz **Due: Monday, 11:59 p.m. ET;** Dates vary by term, see course syllabus ***Note that there is no lab assignment due this week-take this time to prepare for the exam**
Exam 2 (during Module 10)	None	Review content in Module 6 through Module 10	**Due: Monday, 11:59 p.m. ET;** Dates vary by term, see course syllabus