

BIO 124/125: General Biology II with Lab May Tutorial Session 2014

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WWU Mission: An independent voice in higher education, William Woods University distinguishes itself as a student-centered and professions-oriented university committed to the values of ethics, self-liberation, and lifelong education of students in the world community.



Textbook: Reece, J. B., Urry, L. A., Cain, M. L., Wasserman, S. A., Minorsky, P. V., & Jackson, R. B. *Campbell: Biology* (9th ed.) Pearson, 2011; with additional selected readings per the discretion of the professor.

Course Description: A continuation of general biology I. This course emphasizes the diversity of life, which includes anatomical, morphological, and life cycle characteristics of the various phyla. Evolutionary relationships will be stressed. Concurrent enrollment in BIO 125 required. This three-week May session will take the form of an Oxford-style tutorial, with exceptions to accommodate the compressed time scale (e.g. meetings will occur every day M-F and cover a four-hour period). The student is expected to undertake an “ambitious program of reading” and writing during this course of study. For more information on this tutorial format:

<https://www.learning.ox.ac.uk/support/teaching/resources/teaching/>

Prerequisites: Passing grade in BIO114/115. Concurrent enrollment in BIO 125.

Course Objectives: Successful students enrolled in this course will:

1. Gain knowledge of the major phyla among prokaryotes, protists, fungi, plants, and animals.
2. Construct an understanding of the history and underlying themes of biology, especially regarding evolution, organismal diversity, and ecology.
3. Become acquainted with how scientific information is presented. Develop higher order written and oral communication.
4. Use the scientific method to analyze and evaluate problems and information.
5. Become acquainted, at an introductory level, with major physiological principles among animals.
6. Explore how the study of biology impacts quality of life.

Biology Program Objectives:

1. Demonstrate knowledge of cell ultra-structure and basic cellular processes and develop an understanding of the requisites of life.
2. Converse with the basic tenets of transmission, molecular, developmental and population genetics.

3. Contributes to an overview of the major organ systems of the human body and the normal and pathological functioning of those organ systems.
4. Demonstrate knowledge of the diversity and taxonomy of organisms, and the significance of variation in morphology, behavior, and life history.
5. Explain the role that natural selection, genetic drift, and other phenomena have had on the production of biological diversity and the role evolution has in integrating explanations of both the unity and diversity of life.
6. Demonstrate knowledge of scientific methodologies and usage of current scientific equipment and technologies.

Assessment Procedures and Course Assignment Details: Grades are earned through the completion of daily discussions of assigned readings and pointed problems, problem sets, zero-to-three short essays, two long essays, lab activities, a self-designed lab report, and a final exam. Gross points from each component are combined into a final out of 800-830 points.

Assignments from the BIO 124 component:

Daily Reading & Discussion: Each day, the student will be responsible for presenting a summary of the assigned reading selection(s). The purpose of this activity is largely formative and immediate feedback. The professor will pose questions in the context of the content being presented, and the student is expected to offer responses.

Problem Sets: Every other day, a list of relevant problems will be distributed. The student is expected to work on these prompts outside of tutorial meeting times and submit responses upon receiving the next problem set.

Short Essays: Based upon the direction of daily discussions and the potential necessity for the student to demonstrate further thought development along specific content areas, the professor may assign prompts for essays of approximately 500-words. These essays may be used to fulfill documentation of WWU general education objectives for the Natural Sciences. The student is expected to work on these essays outside of regular tutorial meetings.

Long Essays: Two longer essays of at least 1000 words will be assigned May 16 and May 23, due May 19 and May 26 respectively. These essays may be used to fulfill documentation of WWU general education objectives for the Natural Sciences. The student is expected to work on these essays outside of regular tutorial meetings.

Exam: A mandatory final exam will be offered the last day of the tutorial (May 30).

Assignments from the BIO 125 component:

Lab Activities: Each laboratory will have an associated problem set that must be completed toward earning the final grade.

Self-Designed Lab Report: The student will use the scientific method to design and execute an experiment over several lab periods. A formal report on the experiment is due May 30, and should include: introduction, methods, a discussion of results with attendant figures, and a discussion tying it to other contemporary works and future possibilities. This will be used to fulfill documentation of WWU general education objectives for the Natural Sciences.

Grading Scale:

- Gross points earned from each component will be combined into a final total out of 830 points.

- Final course letter grades are based upon the typical 10% scale, e.g. 90%-100% = A. Failure is assigned for any score $\leq 60\%$.

BIO 124 Points Table

Activity	Points
Daily Reading Discussions (x14)	140
Problem Sets (x6)	60
Short Essays (x3)	30
Long Essays (x2)	200
Exam	200
Grand Total	630

BIO 125 Points Table

Activity	Points
Lab Problem Sets (x9)	90
Self Designed Lab Report	110
Grand Total	200

Attendance Policy: Attendance at all meetings is expected.

Discussion Topic Schedule (note: most days include additional non-Campbell readings)

Date (May)	Topic	Readings (from Campbell)	Work Assigned/Due
12	Darwin & Evolution of Populations	22, 23	
13	Evolution of Populations, Origin of species	23, 24	Problem Set (PS) 1
14	Origin of Species, History of life	24, 25	Short Essay 1
15	Phylogeny, Bacteria	26	PS1; PS2
16	Protists	27, 28	Short Essay 1; Long Essay 1
19	Plants I	29	PS2; Long Essay 1; PS3
20	Plants II	30	
21	Fungi	31	PS3; PS4; Short Essay 2
22	Animal Diversity, Invertebrates	32	
23	Invertebrates	33	PS4; Short Essay 2; Long Essay 2; PS5
26	Vertebrates	34	Short Essay 3; Long Essay 2
27	Nutrition	41	PS5; PS6
28	Animal Development; Neurons	47, 48	
29	Population & Community Ecology	53, 54	PS6; Project Presentation
30	Wrap-up and Exam	Comprehensive	Lab Report; Short Essay 3

Lab Schedule

Date (May)	Topic
12	No Lab
13	Natural Selection Simulations
14	Natural Selection Continued (HHMI)
15	HHMI Simulation & Phylogenetics
16	Protists and Fungi
19	Plant Diversity I
20	Plant Diversity II
21	Animal Diversity I
22	Animal Diversity II
23	Population Biology
26	Self-Designed Project
27	Self-designed Project
28	Self-designed Project cont.
29	Foraging Ecology; Project Presentation
30	No Lab

ADA Guidelines: Students who choose to disclose a disability are responsible for notifying the University of their disability on a timely basis. Questions about disability services should be directed to the University's coordinator for disability services. Contact information is 573-592-1194 or ada@williamwoods.edu. The office is on the first floor of the Academic Building.

Academic Integrity Policy and Community Code: It is the expectation of the University that all of its members will uphold the Academic Integrity Policy and the Community Code in adherence to high ethical standards.

Details of the Academic Integrity Policy can be found at the following web address:
<https://www.williamwoods.edu/2011catalog/poldetail.asp?sectionid=273>

Plagiarism Policy may be found at: <https://www.williamwoods.edu/2011catalog/poldetail.asp?sectionid=272>

Details of the Community Code can be found in the Student Handbook (p 5-7) at:
http://www.thezonelive.com/zone/02_SchoolStructure/MO_WilliamWoodsUniversity/handbook.pdf

Academic Credit Hour Definition: The University has adopted the following United States Department of Education definition of a credit hour:

A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than:

- (1) *one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time.*

Expected Outside Time Commitment: Following the US DOE definition, students should expect to spend a minimum of 120h outside time for this tutorial. This equates to approximately 6.3 hours per day in addition to the 4-hour required meetings.

Expected Outside Time Table

Activity	Time (hours)
Readings (x18)	36
Short Essays (x3)	9
Long Essays (x2)	12
Additional Preparation for Exam	21
Problem Sets (x6)	30
Self-designed lab and report preparation	12
Total	120

Common Studies Objectives: On completion of this course (lecture and lab), students gain an understanding of the natural world through systematic observation by analyzing data and by forming, testing and revising hypotheses. For example, students will:

- A. Understand the nature of science: that science is a way of explaining the physical world through replicable physical evidence, and that scientific knowledge is simultaneously reliable and tentative.
- B. Understand current theories/models used to explain natural phenomena.
- C. Apply the scientific method as a means for discovery of knowledge and be able to communicate those ideas.
- D. Interpret the validity of scientific statements in the press; make informed judgments about science-related topics and policies.