

Western Washington University
Biology 101: Introduction to Biology

Instructor:	Georgianne Connell
Class Meetings:	8:30am – 9:50am, Tues and Thurs, AH 100
Lab Meetings:	BIO 258: check schedule under pre-class module on Canvas for times and TA info
Office Hours:	Tues and Thurs 10-11am, BIO 338
Email:	Georgianne.Connell@wwu.edu

COURSE DESCRIPTION Studying biology helps us to uncover mysterious and seemingly miraculous processes that propel organisms to thrive in an ever changing world. It also helps us to understand our place and influence in ecosystems, which is paramount to our survival as a species on this planet.

Come explore biology this quarter and study topics ranging from human genetics, cell metabolism, evolution, ecology, nutrition and cancer. FIVE BIG ideas (broken into six modules) will guide our tour:

1. **CELL MEMBRANE TRAFFIC:** All matter is composed of atoms. Atoms bond to form molecules which make up cells, the smallest unit of life. The way in which molecules interact and move influences cell functioning and cell to cell communication.
2. **ENERGY:** All living things require an energy input and a method of processing that energy into chemical energy. The laws of thermodynamics govern energy pathways within cells, organisms, populations, and ecosystems.
3. **INFORMATION FLOW:**
 - a. **CELL GROWTH and REPRODUCTION:** The expression of genetic information (DNA and/or RNA) is responsible for the growth and reproduction of organisms.
 - b. **GENETICS and PROTEIN SYNTHESIS:** The expression of genetic information (DNA and/or RNA) is responsible for the variability we see within and between species. That variability is expressed through changes in protein form/activity and is studied through a sub-discipline of biology called genetics.
4. **EVOLUTION:** Patterns emerge when scientists study change in DNA within a population over time. Scientists call this evolution.
5. **ECOSYSTEMS:** Ecosystems are complex, interconnected systems that are dynamic and can be studied using the scientific method.

This is an **active learning class** where we utilize online tools and videos at home and use our in-class time to work through the material and explore deeper connections. Be ready to read, discuss, watch, and problem solve many of life's great mysteries.



Although many of you aren't majoring or minoring in biology, the study of biology as part of a **liberal arts education** is tremendously valuable. Strive to make connections between class and your major as well as class and your life. My hope is that you will walk away with a broader perspective; one that enriches your area of study as well as giving you a new skill set for life.



This is an **inclusive classroom**. Everyone is welcome and heartily encouraged to participate regardless of race, sexual orientation, ethnicity, religion, sex, or age! Let's all monitor our speech in class so that everyone feels welcome. Please let me know if there is something I can do (or not do) to make you feel more welcome and comfortable engaging in Biology! Let's recognize and celebrate the differences among us. Those differences will add value to our conversations about biology.

REQUIRED MATERIALS found at WWU bookstore:

- Biology lab manual (found at the bookstore) \$26
- Biology 101 coursepack (shrink wrapped collection of in-class activities). If they run out of coursepacks in the bookstore please fill out an online request form and one will be made for you in 24 hours. \$8
- What about a textbook? There is not a required textbook. If you prefer a hard copy text you can check out any nonmajors biology textbook from the library. I recommend any of the versions of Discover Biology.

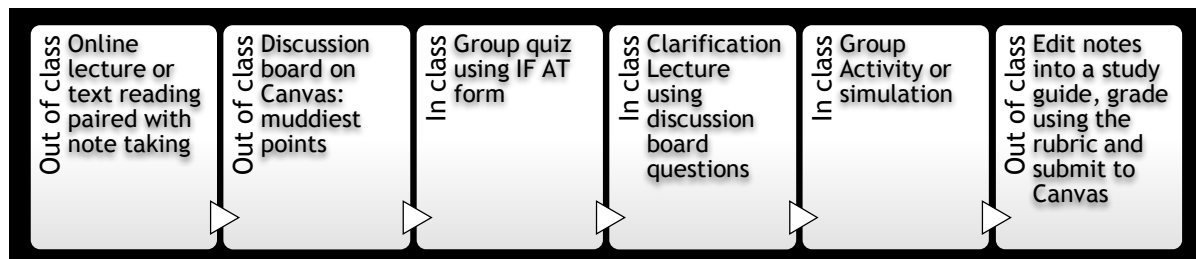
INSTRUCTOR BACKGROUND:

Georgianne Connell, M.S. from WWU marine and estuarine science program. I am a senior instructor in the biology department at WWU and teach Biology 101 year-around. I have also taught oceanography, nutrition, environmental science, marine invertebrate ecology, and tropical marine biology for Seattle Pacific University and Whatcom Community College. I researched the effect of temperature on coral symbioses for my M.S. I have a heart for effective teaching and enjoy conducting research in science education. My husband is the Women's soccer coach here and we have three young children. You can call me Georgianne or Professor Connell.

Need Help?

- Class undergraduate TA: 8:30am class = Ben Pupo (pupob@students.wvu.edu) and Katherine Wald (waldk@students.wvu.edu)
- Graduate TA lab instructors: emails & schedule posted on Canvas under module 1.
- Connell's Office Hours: Tues and Thurs 10-11
- Discussion board/Email on Canvas

CLASS STRUCTURE per module:



POLICIES

Academic Honesty (Class and lab):

Inappropriate conduct includes cheating and plagiarism. As a reminder, cheating can involve copying another student's work, allowing another student to copy your work, collaborating during an individual exam (this includes allowing someone look at your exam answers), using unauthorized material during an exam, or removing an exam. See university policy:

<http://www.wvu.edu/dos/office/conduct/honesty.shtml> and <http://catalog.wvu.edu/content.php?catoid=5&navoid=463>

If dishonesty is witnessed you will be subject to:

- Course failure

Turnitin technology will be used for all assignments turned in for BIO 101, including lab assignments.

Makeup policy and late-work:

- In the event of an emergency or excused absence: quizzes, exams, class activities and labs may be rescheduled and made up. However, students will only have a 3-day window to re-take an exam/quiz. Documentation of the illness (Dr. note, apt note), WWU event, or family emergency (counseling services) will be required. Please let your team know you will be absent. You will receive your group's grade if you have an excused absence for an in class activity. Quizzes will be made up in my office. The health center is no longer administering excuse notes for students not seen by a practitioner. In the instance where you are too sick to make it to a Dr. or class you will need to call or email me by the end of the missed class period to be considered excused.
- If you are not passing the class due to an incompleteness of assignments or because you stopped coming to class, your failure to officially withdraw from class will result in a failing grade. An incomplete will only be given in extreme circumstances and a hardship will only be signed if you withdrawal from WWU for the quarter.

- Late study guides without an approved excuse are deducted 10% per day. Late group activities are not allowed without an approved excuse. Late discussion board comments are not accepted since their purpose is to inform lecture.

Final grades: Final grades 0.5 and higher will be rounded up. No exceptions.

ASSESSMENTS

- Study guides (1 per module): Take notes while watching the online videos. Be sure you can answer the concept checks at the end of each video. Bring your notes to class and use them to add in-class lecture notes, activities, and diagrams to create a complete set of notes. Reorganize and arrange your notes in a way that will help you study for the exam. *Emphasize connections between concepts.* Grade your own study guide using the rubric. Turn it rubric and the guide to Canvas. See study guide examples on Canvas.
- Discussion Board: Once you complete the videos required for a module you will post your muddiest points on Canvas. Muddiest points are the content areas that you found most difficult. You may also comment on another student's post. This helps me to know where the class's weak spots are so that we can cover it more thoroughly in class lecture.
- In-Class Quizzes: Short, closed book, multiple choice quizzes taken by groups. These tests measure your comprehension of the assigned modules at a basic level.
- Guided Inquiry Activities: These are in-class activities completed by your team. Examples include case studies, manipulation of data sets, and web searches. I recommend that each group have at least two laptop/ipad with wifi capabilities and a copy of the book (online or hard copy text). I will haphazardly select 6 of these activities to be graded during the course of the quarter.
- Tests: will consist of a mixture of multiple choice, true/false and matching. You will have a test after each module (6 total tests for the quarter). The test will be held the first 15 minutes of class on test days. After 15 minutes we will collect your tests and pass out a group test. You will have a maximum of 30 minutes to complete the group portion.
 - ✓ Those with DRS accommodations need to see me about alternative times to take the tests.
 - ✓ Please bring a #2 pencil and your student ID on test days.
- Lab: A graduate TA will facilitate learning in lab. Students are required to write lab reports, take quizzes, and engage in discussions. The lab component of this course operates *independently* of the lecture. Therefore, lecture material may not always coincide with lab exercises. A biology graduate student will teach your lab. I encourage you to use this person as a resource for extra help. *If you do not show up to your first lab session, your spot will be given to someone else. You must pass the lab with a 60% or higher to pass the course.*

93-100=	A	73-76 =	C
90-92 =	A-	70-72 =	C-
87-89 =	B+	67-69 =	D+
83-86 =	B	63-66 =	D
80-82 =	B-	60-62 =	D-
77-79 =	C+	Below 60	F

EVALUATION OF WORK

Group vs individual	ASSESSMENTS	% of Grade	Pts.
Individual	Participation points: <ul style="list-style-type: none"> • Pre-class assessment 10pts • SAGE (group functioning) survey pre 5 pts • SAGE (group functioning) survey mid 5pts • SAGE (group functioning) survey post 5 pts 	6%	25
Individual	6 study guides (6 @ 8 pts ea.)	11%	48
Individual	3 post-module tests (3 @ 40 points each)	28%	120
Individual	6 discussion board posts (6 @ 3pts ea)	4%	18
Team	6 group post-module tests (earn up to 5 test points back)	----	----
Team	6 group quizzes (6 @ 10 pts ea.)	14%	60
Team	6 in-class guided inquiry activities (6 @ 10 pts ea.)	14%	60
Team	Lab	23%	100
	TOTAL POINTS	100%	431

COURSE SCHEDULE: subject to *in class* revisions and changes

	5 BIG IDEAS!	Learning Target(s)	Out of class Due dates	In class
T, Mar 31		Assess what students already know.	SAGE online survey due by 5pm. Check to see what group # you are in.	Pre-assessment bring a #2 pencil and W# Taking exams in DRS? See me!
R, April 2	Module 1 CELL MEMBRANE TRAFFIC: All matter is composed of atoms. Atoms bond to form molecules which make up cells, the smallest units of life. The way in which molecules interact and move influences cell functioning and cell to cell communication.	The size, shape, and polarity of ions, molecules and compounds affect their function. Water is especially important for life and has unique properties.	Canvas module 1 due.	Group quiz
T April 7		Cells control how molecules, ions, and compounds travel in and out of their selectively permeable membranes.		Osmosis activity
R, April 9		Cells must balance the water inside and outside of their cells so that they don't explode or shrivel.	Mod 1 study guide due Monday April 13 by 5pm	Osmosis activity

T, April 14	Module 2 ENERGY: All living things require an energy input and a method of processing that energy into chemical energy. The laws of thermodynamics govern energy pathways within cells, organisms, populations, and ecosystems.	Potential energy can be determined (high or low) by assessing the stability of molecules or the direction of a chemical gradient.	Canvas module 2 due.	Group quiz
R, April 16		Photosynthesis is the process by which plants and some protists use CO ₂ , water and light to produce carbohydrates. Inorganic nutrients are required for growth.	-----	Photosynthesis activity
T, April 21		Cellular respiration converts nutrients into a useable form of chemical energy and occurs in most organisms with or without the use of oxygen.	-----	Respiration activity
R, April 23		Photosynthesis and cellular respiration are coupled in photosynthetic cells, between certain populations, and within ecosystems. Our understanding of what healthy nutrition is evolves as scientists continue to make discoveries.	Module 2 study guide due Monday April 27 , by 5pm	
T, April 28	Module 1 & 2 Test 15 minutes for individual 20 minutes for group ----- Module 3 INFORMATION FLOW A. CELL GROWTH and REPRODUCTION: The expression of genetic information (DNA and/or RNA) is responsible for the growth and reproduction of organisms.	Mitosis and meiosis are processes that involve the transmission of genetic material from one cell to another but within very different contexts.	Canvas module 3	Group quiz
R, April 30		Mitosis and meiosis are processes that involve the transmission of genetic material from one cell to another but within very different contexts. A deregulation of the cell cycle due to genetic mutation can causes cells to become cancerous.		Mitosis and Cancer activity
T, May 5		Mitosis and meiosis are processes that involve the transmission of genetic material from one cell to another but within very different contexts.	<u>Out of class:</u> Mod 3 study guide due by Wednesday May 6 at 5pm	Meiosis and Downs syndrome
R, May 7	Module 4 INFORMATION FLOW B. GENETICS AND PROTEIN SYNTHESIS: DNA is heritable and is expressed		SAGE online survey due by 5pm	Genetics activity Blood typing simulation

	through the control of protein synthesis.	The controls that govern gene expression regulate phenotype.	Canvas Mod 4	
T, May 12		The controls that govern gene expression regulate phenotype.		Genetics activity Blood typing simulation
R, May 14		The purpose of replicating DNA for each cell division is that cells need genetic material to make protein. Mutations in DNA can lead to changes in a proteins function.	Out of class: Mod 4 study guide due by Monday May 18 at 5pm	Protein synthesis activity
T, May 19	Module 3 & 4 Test 15 minutes for individual 20 minutes for group ----- Module 5 EVOLUTION: The expression of genetic information (DNA and/or RNA) is responsible for the growth and reproduction of organisms. Patterns emerge when scientists study change in alleles over time Scientists call this evolution	There are 5 forces of evolution: mutation, gene flow, genetic drift, natural selection, and sexual selection.	Canvas module 5	Group quiz Evolution activity
R, May 21		There are 5 forces of evolution: mutation, gene flow, genetic drift, natural selection, and sexual selection. Agriculture is an example of artificial selection. Human ingenuity has led to a highly controlled system of producing food.	Module 5 study guide due by Monday May 25 at 5pm	Evolution activity Artificial Selection activity
T, May 26	Module 6 ECOSYSTEMS: Ecosystems are complex, interconnected systems that are dynamic and can be studied using the scientific method.	Populations within an ecosystem are not static and a population crash can have long term effects on a population's health.		Group quiz Population ecology activity
R, May 28		Density dependent and density independent reduction factors reduce a population's size.		
T, June 2		Nutrients are fixed on Earth and where they are stored influences biodiversity through issues of climate change and eutrophication. Humans alter nutrient pools.		Ecosystem ecology activity
R, June 4		Humans also influence ecosystems for the better.	Module 5 study guide due by Monday June 9 at 5pm.	Class evals
W, June 10	8:30 start time Module 5 & 6 Test Course evals (15 minutes) 15 minutes for individual 20 minutes for group		SAGE online survey due by 5pm	

Appendix: Internationalization Changes

1. In-class activity changes. The module 5 activity on evolution has been altered to prompt students to consider outside perspectives. As students work through a problem set to understand biological concepts, they are also asked questions that help them to understand global context and perspective. An example of the questions are:
 - What was your reaction to the global T allele frequency map?
 - What were your initial assumptions about milk and its role in societies?
 - How has the American dairy-dominant diet shaped your views about lactose tolerance?
 - How has your perspective changed through this assignment?

Groups will answer the last question about perspectives on a discussion thread that I can read in real-time.

2. Laboratory changes. The Biology 101 labs are currently being transformed into authentic research labs focused on eutrophication. One of the tasks students will engage in is to look at global solutions to this issue. During week 7, lab benches will be assigned a continent: Africa, Antarctica, Asia, Australia/Oceania, Europe, North America, or South America. Students will then select a country within that continent and individually research existing solutions to eutrophication. In week 8, tables will present those solutions within the context of their country to the class. Students will use the information from presentations to present a cultural perspective in their final paper.