



Assessment Record

Program: **Biology (BIO 101)**

Assessment period: **Fall 2019 – Summer 2020**

Program or Department Mission:

Program or Department Mission:

The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters.

Course Student Learning Outcomes & Assessment Plan

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism levels.
3. Students will receive the appropriate Biological knowledge to support a career withing the Scientific, Medical, or Health and Fitness community.
4. Students will understand principles of human biology that relate to health and fitness.

Course Level Student Learning Outcomes

1. Students will recognize how the scientific method is utilized to explore biological processes.
2. Students will have the ability to recognize biological processes at the molecular, cellular and organismal levels.
3. Students will demonstrate an ability to identify basic genetic and molecular biology principles.

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence			Use of Results
<p>1. Recognize how the scientific method is utilized to explore biological processes</p>	<p>Student learning outcomes were assessed by using a 15 question standardized multiple choice examination at the end of the semester. A total of three questions (Q-1 – Q-3) were used to assess SLO-1.</p> <p>See Appendix A: BIO 101 SLO Assessment</p>	<p>70% or > successful 69% or < unsuccessful</p> <p>The percent is based upon the average of correctly answered questions related to SLO 1.</p>	Fall 2019	Jefferson	<p># students tested = 75 # correct = 146 % correct = 65%</p>	<p><u>Observations/Changes Based on Current Cycle (19/20)</u></p> <p>One of the largest changes this year was brought about the COVID pandemic – a full transition to online courses, including the labs. Students seemed to benefit from access to course materials (lectures and study aids) throughout the semester. We will continue to explore unfettered access to course materials even when students return to traditional learning modalities.</p>
				Shelby	<p># students tested = 127 # correct = 307 % correct = 81%</p>	
				Pell City	<p># students tested = 25 # correct = 65 % correct = 87%</p>	
			Summer 2020	Jefferson	<p># students tested = 41 # correct = 105 % correct = 85%</p>	
				Shelby	<p># students tested = 29 # correct = 69</p>	

					% correct = 79%	
				Pell City	# students tested =19 # correct =49 % correct = 86%	
				Clanton	# students tested = 25 # correct = 57 % correct = 76%	
			Total Students Tested = 341			
			Total Annual Success Rate: 78%			
2. Have the ability to recognize biological processes at the molecular, cellular	Student learning outcomes were assessed by using a 15 question standardized multiple choice	70% or > successful 69% or < unsuccessful The percent is based upon the	Fall 2019	Jefferson	# students tested = 75 # correct = 362 % correct = 69%	<u>Observations/Changes Based on Current Cycle (19/20)</u> Molecular and cellular processes are challenging to engage students on. We will continue to implement activities and assignments (like case
			Shelby	# students tested = 127 # correct = 644 % correct = 72%		
			Pell City	# students tested = 25		

and organismal levels	examination at the end of the semester. A total of seven questions (Q4-Q10) were used to assess SLO-2. See Appendix A: BIO 101 SLO Assessment	average of correctly answered questions related to SLO 2.			# correct = 160 % correct = 91%	studies) that demonstrate the relevance of these topics.
			Summer 2020	Jefferson	# students tested = 41 # correct = 258 % correct = 90%	
				Shelby	# students tested = 29 # correct = 176 % correct = 87%	
				Pell City	# students tested = 19 # correct = 118 % correct = 89%	
				Clanton	# students tested = 25 # correct = 140 % correct = 80%	
			Total Annual Success Rate: 78%			

3. Demonstrate and ability to identify basic anatomical structures and the correlating physiology of human systems.	Student learning outcomes were assessed by using a 15 question standardized multiple choice examination at the end of the semester. A total of five questions (Q11-Q15) were used to assess SLO-3. See Appendix A: BIO 101 SLO Assessment	70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions related to SLO 3.	Fall 2019	Jefferson	# students tested = 75 # correct = 155 % correct = 41%	<u>Observations/Changes Based on Current Cycle (19/20)</u> This SLO is one of the most challenging for students to master in BIO 101 and historically we fall short of the benchmark. In the upcoming year we will work to ensure students have online resources that focus on human anatomy and physiology and we will continue with the virtual dissections in both traditional and online sections.
				Shelby	# students tested = 127 # correct = 338 % correct = 53%	
				Pell City	# students tested = 25 # correct = 104 % correct = 83%	
			Summer 2020	Jefferson	# students tested = 41 # correct = 179 % correct = 87%	
				Shelby	# students tested = 29 # correct = 128 % correct = 88%	
				Pell City	# students tested = 19 # correct = 86 % correct = 91%	
				Clanton	# students tested = 25	

					<p># correct = 104</p> <p>% correct = 83%</p>	
<p>Plan submission date: September 23, 2022</p>			<p>Submitted by: Crystal Wheeler</p>			

Total Students Tested = 341

Total Annual Success Rate: 64%

Appendix A: BIO 101 SLO Assessment

SLO1

1. The correct sequence of the scientific method is
 - a. observation, questions, hypothesis, predictions, tests
 - b. questions, observations, hypothesis, predictions, tests
 - c. observations, hypothesis, questions, predictions, tests
 - d. observations, predictions, hypotheses, questions, tests
 - e. observations, predictions, questions, tests, hypotheses
2. In order to arrive at a solution to a problem, a scientist usually conducts one or more
 - a. Laws
 - b. Theories
 - c. Experiments
 - d. Principles
3. As a result of experimentation
 - a. More hypothesis may be developed
 - b. More questions may be asked
 - c. A new biological principle could emerge
 - d. Entire theories could be modified or discarded
 - e. All of the above

SLO2

4. The main difference between prokaryotes and eukaryotes is that
 - a. prokaryotes lack a nucleus, eukaryotes have a nucleus
 - b. eukaryotes lack a nucleus, prokaryotes have a nucleus
 - c. prokaryotes have cell walls, eukaryotes do not have cell walls
 - d. eukaryotes have a cell wall, prokaryotes do not have cell walls
 - e. none of the above

5. The building blocks of proteins are called
- a. amino acids
 - b. nucleotides
 - c. fatty acids
 - d. triglycerides
 - e. peptides
6. The Cell Theory states that
- a. Cells arise from matter
 - b. Cells are small
 - c. Cells are of different types
 - d. Cells are the unit of life
7. "Double helix" describes the structure of
- a. polysaccharides
 - b. fats
 - c. fibrous proteins
 - d. DNA
 - e. RNA
8. The first phase of cellular respiration is
- a. the citric acid cycle.
 - b. glycolysis.
 - c. the electron transport system.
 - d. fermentation.
9. Plant cells differ from animal cells in that they have
- a. cell walls
 - b. nuclei
 - c. chloroplasts
 - d. a & b
 - e. a & c

10. "Phospholipid bilayer" describes the structure of
- a. ribosomes
 - b. mitochondria
 - c. chloroplast
 - d. smooth endoplasmic reticulum
 - e. plasma membrane

SLO 3

11. High blood pressure is also known as
- a. anemia
 - b. hypertonic
 - c. hypotonic
 - d. hypertension
12. Food is moved along the length of the digestive system by
- a. active transport
 - b. peristalsis
 - c. diffusion
 - d. osmosis
13. Where in a woman's reproductive tract does fertilization most often take place
- b. In the ovary
 - c. In the fallopian tube
 - d. In the uterus
 - e. In the urethra
 - f. In the abdominal cavity
14. Any disease-causing agent, either virus or bacteria, is a(n):
- a. Antibody
 - b. Vaccine
 - c. Thrombin
 - d. Allergen
 - e. Pathogen

15. During respiration, the diaphragm contracts to increase the volume of the thoracic (chest) cavity. This allows the pressure to drop and leads to _____
- a. Inhalation
 - b. Exhalation
 - c. The pause between breaths
 - d. Exhaustion

Evidence for SLO 1 Example of a scientific method assignment designed to have students apply the scientific method to their own problem

The screenshot shows a Blackboard course interface for 'Introduction to Biology I'. The top navigation bar includes 'Introduction to Biology I', 'Connect Virtual Labs', and 'Scientific Method'. A left-hand navigation menu lists various course items, including 'Introduction to Biology I', 'BIO101 - Introduction to Biology I', 'Blackboard Help', 'Start Here', 'Course Introduction', 'Syllabus - READ CAREFULLY', 'Course Calendar', and 'Course Communication'. The main content area is titled 'Scientific Method' and features a navigation bar with 'Build Content', 'Assessments', 'Tools', and 'Partner Content'. Two assignments are listed:

- Applying the Scientific Method - Pillbug Preference** (Virtual Labs icon)
Virtual Labs
Due Date: September 6, 2020 11:59:00 PM CDT
- Scientific Method Lab Homework** (Document icon)
homework
Due Date: September 6, 2020 11:59:00 PM CDT

Evidence for SLO 2 Example of a cellular respiration case study

The screenshot displays a web browser window with the address bar showing the URL: jeffersonstate.blackboard.com/ultra/courses/_52595_1/cl/outline. The browser tabs include "myJSCC Portal Information - Jeff...", "myJSCC Portal - Home", and "Content".

The main content area shows a course outline with the following items:

- Evolution Case Study
- Chapter 2
- Chapter 3
- Chapter 4
- Chapter 5
- Chapter 6
- Cellular Respiration Case Study** (highlighted in purple)
- Chapter 7
- Chapter 8
- Chapter 9

A left-hand navigation menu is visible, containing the following sections:

- SYLLABUS - READ CAREFULLY!
 - Syllabus Quiz!
- Course Materials
 - Lecture Notes
 - Lab Assignments
 - Portfolio Assignments
- Communications
 - Announcements
 - Discussions
 - Blackboard Messages
- Online Assessments
 - Online Quizzes and Exams
 - Course Grades
- Course Management
 - Control Panel
 - Content Collection
 - Course Tools
 - Evaluation
 - Grade Center
 - Users and Groups
 - Customization
 - Packages and Utilities
 - Help

The Windows taskbar at the bottom shows the search bar with "Type here to search", several application icons, and system tray information including "NASDAQ -2.29%", "9:50 AM", and "12/15/2022".

Evidence for SLO 3 Example of virtual fetal pig dissections utilized

The screenshot shows a web browser window displaying the Whitman College website. The browser's address bar shows the URL: whitman.edu/academics/majors-and-minors/biology/virtual-pig. The website header includes the Whitman College logo and navigation links such as 'ABOUT', 'ACADEMICS', 'ADMISSION & AID', 'AFTER WHITMAN', 'ATHLETICS', and 'CAMPUS LIFE'. A search bar is also present.

The main content area features a breadcrumb trail: [/](#) [ACADEMICS](#) / [MAJORS AND MINORS](#) / [BIOLOGY](#) / [VIRTUAL PIG](#). The title of the page is 'Virtual Fetal Pig Dissection'.

The introductory text reads: 'Welcome to the Whitman College Biology Department's Virtual Pig Dissection (VPD)! This site is designed as a supplement to laboratory dissections exploring introductory mammalian anatomy and physiology – it is basic and many details have been omitted for clarity. We hope that it is suitable for AP Biology students or for students of introductory anatomy and physiology at the college level. We have revised this site to improve the learning experience and accessibility. Please see the "About" page for more details and contact information. We hope you find it useful and enjoy using it!'

Below the text is a photograph of a pink piglet lying on its side against a black background.

At the bottom of the main content area, it states: 'Within this site, you can navigate to any **chapter** from the links at the left. You can always use your browser's "back" button to return to previous chapter subdivisions. To get started, click on a chapter heading at the left or click [anatomical references](#).'

On the right side of the page, there is a vertical menu titled 'Virtual Fetal Pig Dissection' with the following items: 'Anatomical References', 'Sexing your pig', 'Digestive system', 'Excretory system', 'Circulatory system', 'Reproductive system', 'Respiratory System', 'Nervous system', 'Quizzes', and 'About'. Each item has a downward-pointing arrow.

At the bottom of the right sidebar, it says: 'Virtual Fetal Pig Dissection by Earl Fleck, PhD, Thomas Knight, PhD, Whitman College Biology Department'.

The browser's taskbar at the bottom shows the Windows logo, a search bar with the text 'Type here to search', and several application icons. The system tray on the right indicates a temperature of 47°F, 'Sunny' weather, and the date and time: 10:02 AM 12/15/2022.



Assessment Record

Program: **Biology-BIO 102**

Assessment period: **2019-2020**

Program or Department Mission:

The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and to be a more informed member of their community, able to make responsible decisions in biological matters.

Course Student Learning Outcomes & Assessment Plan

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism levels.
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness community.
4. Students will understand principles of human biology that relate to health and fitness.

Course Level Student Learning Outcomes

1. Students will demonstrate knowledge of evolution in both plants and animal life.
2. Students will identify general characteristics, anatomy, and taxonomy of plants and animals.

3. Students will explain the interrelationships between the varied life forms on earth and identify the role of humans with ecological systems.

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence			Use of Results												
<p>SLO1: Demonstrate knowledge of evolution in both plant of animal life.</p>	<p>Student learning outcomes were assessed by using a 25 questions standardized multiple choice examination at the end of the semester. A total of 7 questions (Q1-Q7) were used to assess SLO 1.</p> <p>See appendix A: BIO 102 SLO Assessment</p>	<p>70% or > successful</p> <p>69% or < unsuccessful</p> <p>The percent is based upon the average of correctly answered questions related to SLO 1.</p>	<table border="1"> <tr> <td data-bbox="894 367 1068 570">Fall 2019</td> <td data-bbox="1068 367 1249 570">Shelby</td> <td data-bbox="1249 367 1644 570"># students tested = 29 # correct = 94 % correct = 48%</td> </tr> <tr> <td data-bbox="894 570 1068 773"></td> <td data-bbox="1068 570 1249 773">Pell City</td> <td data-bbox="1249 570 1644 773"># students tested = 25 # correct = 134 % correct = 77%</td> </tr> <tr> <td data-bbox="894 773 1068 976">Summer 2020</td> <td data-bbox="1068 773 1249 976">Shelby</td> <td data-bbox="1249 773 1644 976"># students tested = 27 # correct = 161 % correct = 85%</td> </tr> <tr> <td data-bbox="894 976 1068 1179"></td> <td data-bbox="1068 976 1249 1179">Pell City</td> <td data-bbox="1249 976 1644 1179"># students tested = 29 # correct = 167 % correct = 82%</td> </tr> </table> <p>Total Students Tested = 109</p> <p>Total Annual Success Rate: 73%</p>			Fall 2019	Shelby	# students tested = 29 # correct = 94 % correct = 48%		Pell City	# students tested = 25 # correct = 134 % correct = 77%	Summer 2020	Shelby	# students tested = 27 # correct = 161 % correct = 85%		Pell City	# students tested = 29 # correct = 167 % correct = 82%	<p><u>Observations/Changes Based on Current Cycle (19/20)</u></p> <p>The increase in student mastery of SLO 1 could be due to the biggest change brought by the COVID pandemic – the movement of all materials for the course online. Instructors in the summer semester created a variety of lecture materials and study aids that were placed on the LMS for students to access all semester.</p>
Fall 2019	Shelby	# students tested = 29 # correct = 94 % correct = 48%																
	Pell City	# students tested = 25 # correct = 134 % correct = 77%																
Summer 2020	Shelby	# students tested = 27 # correct = 161 % correct = 85%																
	Pell City	# students tested = 29 # correct = 167 % correct = 82%																

<p>SLO 2: Identify general characteristics, anatomy, and taxonomy of plant and animals.</p>	<p>Student learning outcomes were assessed by using a 25 question standardized multiple choice examination at the end of the semester. A total of 14 questions (Q8-Q21) were used to assess SLO 2.</p> <p>See appendix A: BIO 102 SLO Assessment</p>	<p>70% or > successful</p> <p>69% or < unsuccessful</p> <p>The percent is based upon the average of correctly answered questions related to SLO 2.</p>	Fall 2019	Shelby	# students tested = 28 # correct = 232 % correct = 59%	<p><u>Observations/Changes Based on Current Cycle (19/20)</u></p> <p>The COVID pandemic and transition to online lab offerings required instructors to think about how to create a true lab science experience online. Some examples from the 19/20 include virtual dissections and species journals (see evidence). We will continue to explore resources that create a lab experience for students online.</p>
				Pell City	# students tested = 25 # correct = 294 % correct = 84%	
				Shelby	# students tested = 27 # correct = 304 % correct = 80%	
			Summer 2020	Pell City	# students tested = 29 # correct = 342 % correct = 84%	
			<p>Total Students Tested = 109</p> <p>Total Annual Success Rate: 77%</p>			
<p>SLO3: Explain the interrelationships between the varied life forms on earth</p>	<p>Student learning outcomes were assessed by using 25</p>	<p>70% or > successful</p>	Fall 2019	Shelby	# students tested = 28 # correct = 72	<p><u>Observations/Changes Based on Current Cycle (19/20)</u></p>

<p>and identify the role of humans within ecological systems.</p>	<p>question standardized multiple choice examination at the end of the semester. A total of 4 questions (Q22-Q25) were used to assess SLO 3.</p> <p>See appendix A: BIO 102 SLO Assessment</p>	<p>69% or < unsuccessful</p> <p>The percent is based upon the average of correctly answered questions related to SLO 3.</p>			% correct = 64%	<p>Ecology is the last topic taught in BIO 102 and often receives just a cursory overview. It is our goal to thread the ecology content throughout the semester.</p>
				Pell City	# students tested = 25 # correct = 87 % correct = 87%	
			Summer 2020	Shelby	# students tested = 27 # correct = 94 % correct = 87%	
				Pell City	# students tested = 29 # correct = 101 % correct = 87%	
			<p>Total Students Tested = 109</p> <p>Total Annual Success Rate: 81%</p>			
<p>Plan submission date: Plan submission date:</p>			<p>Submitted by:</p>			

Means of Assessment

Bio102 SLO Quiz

SLO1

1. The idea that organisms with genetically determined characteristics that make them better suited for the environment will have more surviving offspring is
 - A. the inheritance of acquired characteristics.
 - B. the Hardy-Weinberg concept.
 - C. the theory of natural selection.
 - D. convergent evolution.

2. The fittest organism in a population is the
 - A. organism that successfully produces the most offspring.
 - B. strongest and fastest organism.
 - C. organism that lives longest.
 - D. most intelligent organism.

3. The theory of natural selection was proposed
 - A. independently by Wallace
 - B. jointly by Darwin and Wallace.
 - C. independently by Mendel.
 - D. jointly by Wallace and Lamarck.

4. A species is a group of organisms that
- A. can produce fertile offspring when mated.
 - B. all live in the same geographic region.
 - C. always look the same in size and color.
 - D. All of these answers are true.
5. All of the genes shared by a population are its
- A. gene frequency.
 - B. gene pool.
 - C. fitness.
 - D. gene flow.
6. For two types of organisms to belong to the same species, they must
- A. look alike.
 - B. live in the same geographic region.
 - C. be able to naturally produce fertile offspring.
 - D. contain the same gene frequencies.
7. A situation in which a genetically distinct local population is established by a few colonizing individuals is known as
- A. fitness.
 - B. gene pooling.
 - C. genetic drift.
 - D. the founder effect.

SLO2

8. The style and the stigma are both parts of the

- A. stamen.
- B. ovary.
- C. seed.
- D. pistil.

9. Gymnosperms

- A. are usually insect pollinated.
- B. are found above the timberline on mountains.
- C. are seed-bearing plants.
- D. have flowers.

10. All plants

- A. have cell walls of cellulose.
- B. both gametophyte and sporophyte generations.
- C. cells with chloroplasts.
- D. All of the above are correct.

11. Xylem tissues transport

- A. organic molecules.
- B. sperm.
- C. water.
- D. eggs.

12. Plants with seeds inside a fruit

- A. produce pollen.
- B. are angiosperms.
- C. are flowering plants.
- D. All of the above are correct.

13. Alternation of generations means that a plant

- A. alternates between male and female stages.
- B. has one generation that has flowers and another that does not.
- C. has a sporophyte and a gametophyte stage in its life cycle.
- D. switches in its life cycle between above ground and below ground stages.

14. What is the difference between pollination and fertilization?

- A. Pollination is the movement of pollen from the male region of a plant to the female region. Fertilization is the union of a sperm and egg.
- B. Pollination is the movement of pollen from the female region of a plant to the male region. Fertilization is the union of a sperm and egg.
- C. Pollination is the same as fertilization.
- D. Fertilization is the movement of pollen from the male region of a plant to the female region. Pollination is the union of a sperm and egg.

15. This term is used to describe the fact that plants cycle between two different stages in their life, the diploid sporophyte and haploid gametophyte.

- A. tropism
- B. sporulation
- C. alternation of generations
- D. germination

16. An animal that feeds on living material but does not kill the animal it feeds on is a

- A. prey.
- B. host.
- C. parasite.
- D. predator.

17. An example of community is

- A. this class.
- B. the various kinds of plants, animals, and bacteria in a vacant lot.
- C. bees in a hive.
- D. the water, soil, and air in a farmer's field.

18. Which of the following is NOT a characteristic of most animals?

- A. They are heterotrophic.
- B. They have an extracellular matrix of proteins such as collagen.
- C. They have cell walls.
- D. They have a nervous system.

19. Which of the phyla of animals has the greatest number of species?

- A. Arthropoda
- B. Chordata
- C. Mollusca
- D. Annelida
- E. Nematoda

20. The primary organ of photosynthesis in a plant is the:

- A. Stomata
- B. Leaf
- C. Bark
- D. Stem
- E. Chlorophyll

21. The evaporation of water from the leaf of a plant is:

- A. Transpiration
- B. Totally prevented by the leaf's cuticle
- C. Hydrolysis
- D. Condensation
- E. Sublimation

SLO3

22. If you were studying a species which has totally disappeared from the planet you would be studying:

- A. An endangered species
- B. An introduced species
- C. An extinct species
- D. A threatened species
- E. A keystone species

23. If you were studying variation among members of a population you would most likely be studying which of the following?

- A. Sustainable diversity
- B. Ecosystem diversity
- C. Landscape diversity
- D. Keystone diversity
- E. Genetic diversity

24. Species that influence the viability of a community, although their numbers may not be exceedingly high, are referred to as:

- A. Pioneer species
- B. Alien species
- C. Introduced species
- D. Nonnative species
- E. Keystone species

25. You are walking along a beach and find an organism which has an exoskeleton, five pairs of walking legs, and compound eyes. Based on this information the organism you found was:

- A. An arachnid
- B. An insect
- C. A centipede
- D. A crustacean
- E. A millipede

Evidence for SLO 1: Screenshot of an instructor's blackboard with lecture notes for students regarding origins of life, evolution and speciation – all topics covered by SLO 1

The screenshot displays a Blackboard LMS interface for a course titled "Introduction to Biology II". The page is titled "Lecture Outlines" and features a navigation sidebar on the left. The sidebar includes sections for "Introduction to Biology II" (with links to Home Page, Course Materials, Recorded Lectures, BIO 102 Textbook, Tools, Help, and Make up Exams) and "Course Management" (with links to Control Panel, Content Collection, Course Tools, Evaluation, Grade Center, Users and Groups, Customization, Packages and Utilities, and Help). The main content area shows a list of lecture outlines, each with a document icon and a dropdown arrow:

- Origins of Life
- Evolution Part 1
- Evolution Part 2
- Speciation and Classification
- Prokaryotes
- Protists and Fungi
- Plants part 1
- Seed Plants

The browser's address bar shows the URL "jeffersonstate.blackboard.com/ultra/courses/_52033_1/cl/outline". The Windows taskbar at the bottom indicates the time is 9:17 AM on 12/15/2022, with a NASDAQ 100 index of -2.69%.

Evidence for SLO 2: Examples of virtual lab dissection materials

The screenshot displays a Blackboard course page for 'Introduction to Biology II' on the date 'April 3rd'. The page is titled 'April 3rd' and features a navigation menu on the left with options like 'Home Page', 'Course Materials', 'Recorded Lectures', 'BIO 102 Textbook', 'Tools', 'Help', and 'Make up Exams'. Below this is a 'Course Management' section with a 'Control Panel' containing 'Content Collection', 'Course Tools', 'Evaluation', 'Grade Center', 'Users and Groups', 'Customization', 'Packages and Utilities', and 'Help'. The main content area is titled 'April 3rd' and includes sub-sections for 'Build Content', 'Assessments', 'Tools', and 'Partner Content'. A list of five virtual lab dissection materials is displayed, each with a document icon and a dropdown arrow:

- [Starfish dissection powerpoint](#)
- [Starfish dissection lab notebook instructions](#)
- [Fetal Pig Virtual dissection](#)
- [Fetal Pig Dissection](#)
- [Fetal Pig Lab notebook instructions](#)

The Windows taskbar at the bottom shows the search bar, taskbar icons for various applications, and system tray information including the date '12/15/2022' and time '9:25 AM'.



Assessment Record

Program: Biology (BIO 103)

Assessment period: Fall 2019 – Summer 2020

Program or Department Mission:

Program or Department Mission:

The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters.

Course Student Learning Outcomes & Assessment Plan

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism levels.
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness community.
4. Students will understand principles of human biology that relate to health and fitness.

Course Level Student Learning Outcomes

1. Students will demonstrate knowledge of the fundamental concepts and processes in biology including the scientific method, evolution, biological macromolecules and biochemistry
2. Students will demonstrate an ability to identify molecular and cellular processes in prokaryotic and eukaryotic cells.
3. The student will demonstrate an ability to recognize genetic, morphological and life cycle characteristics of bacteria, fungi, and viruses.

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence			Use of Results																								
<p>1. Demonstrate knowledge of the fundamental concepts and processes in biology including the scientific method, evolution, biological macromolecules and biochemistry</p>	<p>Student learning outcomes were assessed by using a 14 question standardized multiple choice examination at the end of the semester. A total of four questions (Q1 – Q4) were used to assess SLO1</p> <p>See Appendix A for SLO assessment questions</p>	<p>70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions related to SLO1</p>	<table border="1"> <tr> <td data-bbox="882 315 1054 428">Fall 2019</td> <td data-bbox="1054 315 1234 428">Jefferson</td> <td data-bbox="1234 315 1627 428"># students tested = 34 # correct = 100 % correct = 74%</td> </tr> <tr> <td data-bbox="882 428 1054 542"></td> <td data-bbox="1054 428 1234 542">Shelby</td> <td data-bbox="1234 428 1627 542"># students tested = 59 # correct = 173 % correct = 73%</td> </tr> <tr> <td data-bbox="882 542 1054 656"></td> <td data-bbox="1054 542 1234 656">Clanton</td> <td data-bbox="1234 542 1627 656"># students tested = 16 # correct = 60 % correct = 94%</td> </tr> <tr> <td data-bbox="882 656 1054 769"></td> <td data-bbox="1054 656 1234 769">Pell City</td> <td data-bbox="1234 656 1627 769"># students tested = 26 # correct = 80 % correct = 77%</td> </tr> <tr> <td data-bbox="882 769 1054 883">Summer 2020</td> <td data-bbox="1054 769 1234 883">Jefferson</td> <td data-bbox="1234 769 1627 883"># students tested = 28 # correct = 104 % correct = 93%</td> </tr> <tr> <td data-bbox="882 883 1054 997"></td> <td data-bbox="1054 883 1234 997">Shelby</td> <td data-bbox="1234 883 1627 997"># students tested = 21 # correct = 73 % correct = 87%</td> </tr> <tr> <td data-bbox="882 997 1054 1110"></td> <td data-bbox="1054 997 1234 1110">Clanton</td> <td data-bbox="1234 997 1627 1110"># students tested = 8 # correct = 29 % correct = 91%</td> </tr> <tr> <td colspan="3" data-bbox="882 1110 1627 1260"> <p>Total Students Tested = 192 Total Annual Success Rate: 81%</p> </td> </tr> </table>			Fall 2019	Jefferson	# students tested = 34 # correct = 100 % correct = 74%		Shelby	# students tested = 59 # correct = 173 % correct = 73%		Clanton	# students tested = 16 # correct = 60 % correct = 94%		Pell City	# students tested = 26 # correct = 80 % correct = 77%	Summer 2020	Jefferson	# students tested = 28 # correct = 104 % correct = 93%		Shelby	# students tested = 21 # correct = 73 % correct = 87%		Clanton	# students tested = 8 # correct = 29 % correct = 91%	<p>Total Students Tested = 192 Total Annual Success Rate: 81%</p>			<p><u>Observations/Changes Based on Current Cycle (19/20)</u></p> <p>COVID forced us to transition to all online offerings. Students likely benefited from continuous access to course materials. We will continue to make materials available throughout the semester for students regardless of course modality (traditional, hybrid or online)</p> <p>Instructors will also add an additional assignment in support of this outcome.</p>
Fall 2019	Jefferson	# students tested = 34 # correct = 100 % correct = 74%																												
	Shelby	# students tested = 59 # correct = 173 % correct = 73%																												
	Clanton	# students tested = 16 # correct = 60 % correct = 94%																												
	Pell City	# students tested = 26 # correct = 80 % correct = 77%																												
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	Shelby	# students tested = 21 # correct = 73 % correct = 87%																												
	Clanton	# students tested = 8 # correct = 29 % correct = 91%																												
<p>Total Students Tested = 192 Total Annual Success Rate: 81%</p>																														
<p>2: Demonstrate an ability to identify molecular and cellular processes in</p>	<p>Student learning outcomes were assessed by using a 14 question standardized</p>	<p>70% or > successful 69% or < unsuccessful The percent is based upon the</p>	<table border="1"> <tr> <td data-bbox="882 1260 1054 1477">Fall 2019</td> <td data-bbox="1054 1260 1234 1477">Jefferson</td> <td data-bbox="1234 1260 1627 1477"># students tested = 34 # correct = 113 % correct = 47%</td> </tr> </table>			Fall 2019	Jefferson	# students tested = 34 # correct = 113 % correct = 47%	<p><u>Observations/Changes Based on Current Cycle (19/20)</u></p> <p>The COVID pandemic has led to all Biology</p>																					
Fall 2019	Jefferson	# students tested = 34 # correct = 113 % correct = 47%																												

<p>prokaryotic and eukaryotic cells.</p>	<p>multiple choice examination at the end of the semester. A total of seven questions (Q5 – Q11) were used to assess SLO2</p> <p>See Appendix A for SLO assessment questions</p>	<p>average of correctly answered questions related to SLO2</p>	<table border="1"> <tr> <td></td> <td>Shelby</td> <td># students tested = 59 # correct = 191 % correct = 46%</td> </tr> <tr> <td></td> <td>Clanton</td> <td># students tested = 16 # correct = 100 % correct = 89%</td> </tr> <tr> <td></td> <td>Pell City</td> <td># students tested = 26 # correct = 103 % correct = 57%</td> </tr> <tr> <td>Summer 2020</td> <td>Jefferson</td> <td># students tested = 28 # correct = 162 % correct = 83%</td> </tr> <tr> <td></td> <td>Shelby</td> <td># students tested = 21 #correct = 101 % correct = 69%</td> </tr> <tr> <td></td> <td>Clanton</td> <td># students tested = 8 # correct = 45 % correct = 80%</td> </tr> </table> <p>Total Students Tested = 192 Total Annual Success Rate: 61%</p>		Shelby	# students tested = 59 # correct = 191 % correct = 46%		Clanton	# students tested = 16 # correct = 100 % correct = 89%		Pell City	# students tested = 26 # correct = 103 % correct = 57%	Summer 2020	Jefferson	# students tested = 28 # correct = 162 % correct = 83%		Shelby	# students tested = 21 #correct = 101 % correct = 69%		Clanton	# students tested = 8 # correct = 45 % correct = 80%	<p>courses and labs being offered online. It appears that students have benefited from having access to lectures and study materials throughout the semester and we will continue to provide that.</p>
	Shelby	# students tested = 59 # correct = 191 % correct = 46%																				
	Clanton	# students tested = 16 # correct = 100 % correct = 89%																				
	Pell City	# students tested = 26 # correct = 103 % correct = 57%																				
Summer 2020	Jefferson	# students tested = 28 # correct = 162 % correct = 83%																				
	Shelby	# students tested = 21 #correct = 101 % correct = 69%																				
	Clanton	# students tested = 8 # correct = 45 % correct = 80%																				
<p>3: Demonstrate an ability to recognize genetic, morphological and life cycle characteristics of bacteria, fungi, and viruses.</p>	<p>Student learning outcomes were assessed by using a 14 question standardized multiple choice examination at the end of the semester. A total of three questions (Q12</p>	<p>70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions related to SLO3</p>	<table border="1"> <tr> <td>Fall 2019</td> <td>Jefferson</td> <td># students tested = 34 # correct = 58 % correct = 57%</td> </tr> <tr> <td></td> <td>Shelby</td> <td># students tested = 59 # correct = 83 % correct = 47%</td> </tr> <tr> <td></td> <td>Clanton</td> <td># students tested = 16 # correct = 45 % correct = 94%</td> </tr> <tr> <td></td> <td>Pell City</td> <td># students tested = 26 # correct = 38 % correct = 49%</td> </tr> </table>	Fall 2019	Jefferson	# students tested = 34 # correct = 58 % correct = 57%		Shelby	# students tested = 59 # correct = 83 % correct = 47%		Clanton	# students tested = 16 # correct = 45 % correct = 94%		Pell City	# students tested = 26 # correct = 38 % correct = 49%	<p>Observations/Changes Based on Current Cycle (19/20)</p> <p>It is again our goal to review resources to ensure that we are adequately covering this content.</p>						
Fall 2019	Jefferson	# students tested = 34 # correct = 58 % correct = 57%																				
	Shelby	# students tested = 59 # correct = 83 % correct = 47%																				
	Clanton	# students tested = 16 # correct = 45 % correct = 94%																				
	Pell City	# students tested = 26 # correct = 38 % correct = 49%																				

	<p>– Q14) was used to assess SLO3</p> <p>See Appendix A for SLO assessment questions</p>		<table border="1"> <tr> <td data-bbox="871 131 1052 250">Summer 2020</td> <td data-bbox="1052 131 1232 250">Jefferson</td> <td data-bbox="1232 131 1627 250"># students tested = 28 # correct = 70 % correct = 83%</td> </tr> <tr> <td data-bbox="871 250 1052 358"></td> <td data-bbox="1052 250 1232 358">Shelby</td> <td data-bbox="1232 250 1627 358"># students tested = 21 # correct = 52 % correct = 83%</td> </tr> <tr> <td data-bbox="871 358 1052 467"></td> <td data-bbox="1052 358 1232 467">Clanton</td> <td data-bbox="1232 358 1627 467"># students tested = 8 # correct = 19 % correct = 79%</td> </tr> <tr> <td data-bbox="871 467 1052 537"></td> <td data-bbox="1052 467 1232 537"></td> <td data-bbox="1232 467 1627 537"></td> </tr> </table>	Summer 2020	Jefferson	# students tested = 28 # correct = 70 % correct = 83%		Shelby	# students tested = 21 # correct = 52 % correct = 83%		Clanton	# students tested = 8 # correct = 19 % correct = 79%				
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	Clanton	# students tested = 8 # correct = 19 % correct = 79%														
Plan submission date:			<p>Total Students Tested = 192 Total Annual Success Rate: 63%</p> <p>Submitted by:</p>													

Appendix A: BIO 103 SLO Assessment

SLO 1

1. A hypothesis should always be _____.
 - A. correct
 - B. based on observation
 - C. previously proven
 - D. presented as at least three possible explanations
2. Scientist have determined the age of Earth by using a process involving _____.
 - A. radioactive decay
 - B. counting rock layers.
 - C. measuring incoming cosmic dust
 - D. studying the movement of the continents
3. In an atom protons would be found
 - A. in an orbital around the nucleus
 - B. in the nucleus
 - C. attached to electrons
 - D. it varies by element
 - E. bonds
4. The building blocks of proteins are _____.
 - A. amino acids
 - B. nucleotides
 - C. fatty acids
 - D. triglycerides
 - E. peptides

SLO 2

5. During aerobic respiration, the glucose molecule yields energy through a series of pathways. Which of the following is NOT one of these pathways?
 - A. Kreb's cycle
 - B. Glycolysis
 - C. Electron Transport Chain
 - D. Calvin Cycle

6. In the Dark Reactions/Calvin Cycle _____ is used to build a chain of carbons to form a simple sugar.
- A. atmospheric oxygen
 - B. methane gas
 - C. carbon dioxide
 - D. amino acids
 - E. nucleic acids
7. While there are other differences between prokaryotes and eukaryotes, the most defining difference is the absence of _____ in prokaryotes.
- A. plasma membrane
 - B. DNA
 - C. cytoplasm
 - D. nucleus
8. "Phospholipid bilayer" best describes the structure of
- A. ribosomes
 - B. mitochondria
 - C. chloroplast
 - D. cytoplasm
 - E. plasma membrane
9. Mendel found that the ratio of the two phenotypes in the F₂ generation of a monohybrid cross is
- A. 1:2:1
 - B. 9:3:3:1
 - C. 3:1
 - D. 1:3:3:3
 - E. 1:2
10. The process in which mRNA directs the synthesis of proteins is known as
- A. transcription
 - B. translation
 - C. replication
 - D. a & b

11. The chromosome number is reduced in half in

- A. mitosis
- B. meiosis
- C. neither a nor b
- D. both a & b

SLO 3

12. Bacteria reproduce asexually by _____.

- A. Binary fission
- B. Mitosis
- C. Meiosis
- D. Seeds

13. Protozoa differ from bacteria in that protozoa _____.

- A. Have a cell wall
- B. Have a nucleus
- C. Have a cell membrane
- D. Have ribosomes

14. A virus would be classified as being in what domain?

- A. Protista
- B. Eukaryotic
- C. Prokaryotic
- D. None of the above

SLO 1 Evidence: Example of a Comprehensive Chemistry Review Assignment

Introduction to Chemistry Study Guide

1. Define element, atomic number, atomic mass, and isotope
2. What particles make up an atom? What is the charge on each particle and where is it located in the atom?
3. What determines an atom's atomic number?
4. What determines an atom's atomic mass?
5. What particle is varied in isotopes?
6. What particle is involved in chemical bonds?
7. Atom A was neutral and gains a proton – is it now positive or negative? Atom B was neutral and gains an electron – is it now positive or negative? Atom C was neutral and gains a neutron – is it now positive or negative?
8. Define oxidation and reduction
9. What is the octet rule?
10. How many chemical bonds can carbon form? Why? How many chemical bonds can oxygen form? Why? How many chemical bonds can hydrogen form? Why?
11. What is an ionic bond? Draw an example of two atoms in an ionic bond
12. What is a covalent bond? Draw an example of two atoms in a covalent bond

13. What is a polar bond?

14. What are the five properties that make water special? Explain what each of these properties means.

15. What is an acid? What is a base?

16. What exactly does pH measure?

17. A substance has a pH of 5, is it an acid or a base?

18. What is a buffer and how does it work? Give an example of a biologically relevant buffer.










SLO 2 Evidence: Materials available throughout the semester

Principles of Biology I Learning Modules

Principles of Biology I

- Introduction
- Course Schedule
- Connect Registration
- Participation Quiz
- Learning Modules
- Assessments
- Email
- Discussions
- Collaborate
- Tools
- Help
- My Grades

Learning Modules

-  **The Characteristics of Life** A↑
-  **Biological Classification** A↑
-  **The Scientific Method** A↑
-  **Evolution** A↑
-  **Basic Chemistry** A↑
-  **Biological Macromolecules** A↑
 [BIOLOGICAL MACROMOLECULES.docx](#) ✓ A↑
-  **Exam 1 Review** A↑
 [BIO 103 Exam 1 Review.docx](#) ✓ A↑

SLO 3 Evidence: Materials reviewing bacteria, viruses, fungi

BIO 103 Lab #12—The Algae

--Make sure you know the definitions of the following terms:

Eukaryotic

Fungi

Heterotrophic

Animal

Plant

Autotrophic

Protista

Algae

Question 1: Describe the importance of algae in global oxygen production and food production.

Question 2: List the two ways that algae can be distinguished.

--Be sure to know that the following organisms are types of algae:

Chlamydomonas

Spirogyra

Volvox

Diatoms

Euglena

BIO 103 Lab #26—The Protists (Protozoa and Slime Molds)

____--Look over Table 26.1. Make sure you can tell which organism is found in each group. Ex. *Amoeba* and ____



Assessment Record

Program: Biology (BIO 104)

Assessment period: Fall 2019 –Summer 2020

Program or Department Mission:

The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters.

Course Student Learning Outcomes & Assessment Plan

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism level
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness community
4. Students will understand principles of human biology that relate to health and fitness

Course Level Student Learning Outcomes

1. The student will recognize the fundamental principles and supporting evidence necessary to explain Darwinian evolution.
2. The student will demonstrate an ability to identify the structural characteristics and life cycles of both plant and animal phyla.
3. The student can recognize components of community ecology and identify how biodiversity contributes to a stable ecosystem.

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence			Use of Results
1. Recognize the fundamental principles and supporting evidence necessary to explain Darwinian evolution.	Student learning outcomes were assessed using a 20 question multiple-choice assessment at the end of each semester. A total of	70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions	Fall 2019	Jefferson	# students tested = 12 # correct = 77 % correct = 71%	<u>Observations/Changes Based on Current Cycle (19/20)</u> We will provide materials related to evolution for
			Summer 2020	Jefferson	# students tested = 19 # correct = 149 % correct = 87%	
			Summer	Shelby	# students tested = 21	

	<p>9 questions (Q1-Q6 and Q 18-20) were used to assess understanding of SLO1</p> <p>See Appendix A: BIO 104 SLO Assessment</p>	<p>(1 to 6) related to SLO 1. (6 questions)</p>	<table border="1"> <tr> <td data-bbox="995 134 1129 212">2020</td> <td data-bbox="1129 134 1306 212"></td> <td data-bbox="1306 134 1703 212"># correct = 159 % correct = 84%</td> </tr> </table> <p>Total Students Tested = 52 Total Annual Success Rate = 82%</p>			2020		# correct = 159 % correct = 84%	<p>students to access remotely (see example of hominin materials). Students have images of the skull models to study throughout the unit and then take an online quiz at the end of the unit. They can take the low stakes quiz as many times until they reach the score they desire. This encourages them to engage with the material and should lead to better learning outcomes.</p>						
2020		# correct = 159 % correct = 84%													
<p>2. Demonstrate an ability to identify the structural characteristics and life cycles of both plant and animal phyla.</p>	<p>Student learning outcomes were assessed using a 20 question multiple-choice assessment at the end of each semester. A total of 6 questions (Q7-Q12) were used to assess mastery of SLO2</p> <p>See Appendix A: BIO 104 SLO Assessment</p>	<p>70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions (7 to 12 and 18 to 20) related to SLO 2. (9 total)</p>	<table border="1"> <tr> <td data-bbox="995 755 1129 865">Fall 2019</td> <td data-bbox="1129 755 1306 865">Jefferson</td> <td data-bbox="1306 755 1703 865"># students tested = 12 # correct = 56 % correct = 78%</td> </tr> <tr> <td data-bbox="995 865 1129 976">Summer 2020</td> <td data-bbox="1129 865 1306 976">Jefferson</td> <td data-bbox="1306 865 1703 976"># students tested = 19 # correct = 101 % correct = 89%</td> </tr> <tr> <td data-bbox="995 976 1129 1086">Summer 2020</td> <td data-bbox="1129 976 1306 1086">Shelby</td> <td data-bbox="1306 976 1703 1086"># students tested = 21 # correct = 117 % correct = 93%</td> </tr> </table> <p>Total Students Tested = 52 Total Annual Success Rate = 88%</p>			Fall 2019	Jefferson	# students tested = 12 # correct = 56 % correct = 78%	Summer 2020	Jefferson	# students tested = 19 # correct = 101 % correct = 89%	Summer 2020	Shelby	# students tested = 21 # correct = 117 % correct = 93%	<p><u>Observations/Changes Based on Current Cycle (19/20)</u></p> <p>The transition to an online course and laboratory experience due to COVID has led to the generation of at home laboratory kits where students can continue to engage in dissections. It is our hope that the at home lab kits paired with video support will allow students to continue to meet this learning objective.</p>
Fall 2019	Jefferson	# students tested = 12 # correct = 56 % correct = 78%													
Summer 2020	Jefferson	# students tested = 19 # correct = 101 % correct = 89%													
Summer 2020	Shelby	# students tested = 21 # correct = 117 % correct = 93%													

<p>3. Recognize components of population and community ecology and identify how biodiversity contributes to a stable ecosystem.</p>	<p>Student learning outcomes were assessed using a 20 question multiple-choice assessment at the end of each semester. A total of 5 questions (Q13-Q17) were used to assess mastery of SLO3</p> <p>See Appendix A: BIO 104 SLO Assessment</p>	<p>70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions (13 to 17) related to SLO 3. (5 total)</p>	<table border="1"> <tr> <td data-bbox="987 207 1134 316">Fall 2019</td> <td data-bbox="1134 207 1302 316">Jefferson</td> <td data-bbox="1302 207 1711 316"># students tested = 12 # correct = 49 % correct = 82%</td> </tr> <tr> <td data-bbox="987 316 1134 425">Summer 2020</td> <td data-bbox="1134 316 1302 425">Jefferson</td> <td data-bbox="1302 316 1711 425"># students tested = 19 # correct = 68 % correct = 72%</td> </tr> <tr> <td data-bbox="987 425 1134 534">Summer 2020</td> <td data-bbox="1134 425 1302 534">Shelby</td> <td data-bbox="1302 425 1711 534"># students tested = 21 # correct = 83 % correct = 79%</td> </tr> </table> <p>Total Students Tested = 52 Total Annual Success Rate = 77%</p>			Fall 2019	Jefferson	# students tested = 12 # correct = 49 % correct = 82%	Summer 2020	Jefferson	# students tested = 19 # correct = 68 % correct = 72%	Summer 2020	Shelby	# students tested = 21 # correct = 83 % correct = 79%	<p><u>Observations/Changes Based on Current Cycle (19/20)</u></p> <p>We will continue to provide students with ecology materials that they can access remotely. We will also work to include ecology content throughout the semester.</p>
Fall 2019	Jefferson	# students tested = 12 # correct = 49 % correct = 82%													
Summer 2020	Jefferson	# students tested = 19 # correct = 68 % correct = 72%													
Summer 2020	Shelby	# students tested = 21 # correct = 83 % correct = 79%													
<p>Plan submission date:</p>			<p>Submitted by:</p>												

Appendix A: BIO 104 SLO Assessment

- 1) In the Hardy-Weinberg formula, what does q^2 represent?
 - A) frequency of the a allele
 - B) frequency of the A allele
 - C) frequency of the aa genotype
 - D) frequency of the AA genotype

- 2) Disruptive selection
 - A) eliminates both extremes
 - B) eliminates one extreme type
 - C) favors heterozygotes
 - D) eliminates intermediate types

- 3) Natural selection always results in____.
 - A) a decrease in the size of a population
 - B) offspring better adapted to their parents' environment than were their parents
 - C) increased genetic variation
 - D) offspring better adapted to a future environment

- 4) Which of the following is NOT one of the 5 agents that underlie evolutionary change?
 - A) gene flow
 - B) mutation
 - C) genetic drift
 - D) random mating
 - E) selection

- 5) Which of the following is NOT a type of prezygotic isolating mechanism?
 - A) Temporal isolation
 - B) Ecological isolation
 - C) Prevention of gamete fusion
 - D) Hybrid sterility

- 6) Two populations of salamanders are separated by an impassable valley. The populations are:
 - A) subspecies
 - B) allopatric
 - C) divergent
 - D) sympatric
 - E) founders

- A) Growth is limited by the carrying capacity
- B) There is an unlimited environment for growth
- C) It has 3 phases: lag, log and plateau
- D) All of the above are true

16) The size of a deer population in the wild depends on its _____ type relationships with other species.

- A) Parasite-host
- B) Competition
- C) Predator-prey
- D) Herbivory
- E) All of the above

17) Termites possess microorganisms in their gut that are able to digest cellulose from wood and break it down into simple sugars that feeds both organisms. This relationship may be described as

_____.

- A) symbiotic
- B) parasitic
- C) mutualistic
- D) A and C

18) Which of the following is a type of vascular plant?

- A) Anthrocerotophyta
- B) Hepaticophyta
- C) Bryophyta
- D) Lycophyta

19) The _____ serves primarily to transport water and minerals up from the plant's roots.

- A) rhizomes
- B) xylem
- C) phloem
- D) stoma

20) Sporophytes are always

- A) diploid
- B) photosynthetic
- C) nonphotosynthetic
- D) haploid

Principles of Biology II Hybrid– Syllabus Fall 2020

INSTRUCTOR: Dr. Charles J. Venglarik “Dr V”
Jefferson Campus, Ruby Carson Hall 242D
Office hours: M-F 2:30 to 6:30 PM.
Email: cvenglarik@jeffersonstate.edu

ACCESS TO A RELIABLE HIGH-SPEED INTERNET CONNECTION IS REQUIRED.

Lectures, streaming data, other essential resources and all exams will be posted on Blackboard.

COURSE DESCRIPTION: Biology 104S is the second of a two-semester sequence for science majors. This course begins by examining the mechanisms and evidence for evolution. Subsequently it surveys the classification, morphology, physiology, and reproduction for each major phylum of plants and animals. Finally, we describe how organisms interact with their environment. 3 hrs of laboratory are required.

LABORATORY: Students are expected to dissect and/or examine preserved specimens as part of the laboratory experience. Old clothes or a lab coat, goggles and non-sterile latex gloves are required during these activities. Gloves and goggles are not provided and may be obtained at drug or home improvement stores. Proper techniques and safety must be observed. No food, drinks or children are permitted in the onsite laboratory.

ATTENDANCE Students are expected to attend all classes for which they are registered. Students who are unable to attend class regularly, regardless of the reason or circumstance, should withdraw from that class before poor attendance interferes with the student’s ability to achieve the objectives required in the course. The W and W/P policies of the college should be noted. Not attending class does not constitute an automatic withdrawal. Withdrawal from class may affect eligibility for federal financial aid. Open laboratory hours designed to give students more study time will be posted if/when the Biology Department opens the lab.

Evidence for SLO 1: Hominin evolution material including lecture, study aids, and a practice quiz.

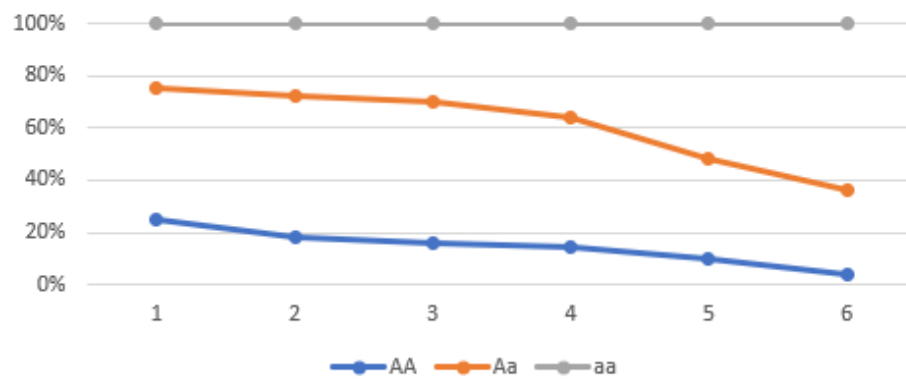
The screenshot displays a Canvas LMS interface for a course titled "Principles of Biology II". The left sidebar contains navigation options: Home Page, Information, Content, Discussions, Groups, Tools, and Help. Below these are "Course Management" and "Control Panel" sections, including Content Collection, Course Tools, Evaluation, Grade Center, Users and Groups, Customization, Packages and Utilities, and Help. The main content area is titled "Hominin Evolution (09/01/2020)" and includes sub-sections for Build Content, Assessments, Tools, and Partner Content. The content list includes:

- Hominin Skull Lab Lecture**: A video player showing a hominid skull. The video has a duration of 0:00 / 17:37. A download link for "hominin skulls 2.mp4" is provided.
- Overview of Hominin Evolution**: A document icon with a red prohibition sign.
- Link to photos of replica Hominin skulls**: A link icon with a red prohibition sign.
- Hominin "Practice" Quiz**: A document icon with a red prohibition sign. The text below reads: "Availability: Item is hidden from students. It was last available on Oct 7, 2020 11:59 PM. This is a short quiz to help you identify the replica hominin fossils that we have in lab. It is fill-in-the-blank. The answers should all be written in proper 'genus species' format. Correct spelling matters. The lab exam will feature similar photographs and you will have only one chance to get it right (including the spelling). The aim of this quiz is to give you some practice in identifying a specimen and typing in it's name. It is timed and you will have 5 minutes to type in the 10 names."
- Link to short video "Great Transitions: The Origin of Humans"**: A link icon with a red prohibition sign.
- PDF - Quiz on the Origins of Humans**: A document icon with a red prohibition sign, a lock icon, and an up/down arrow icon.

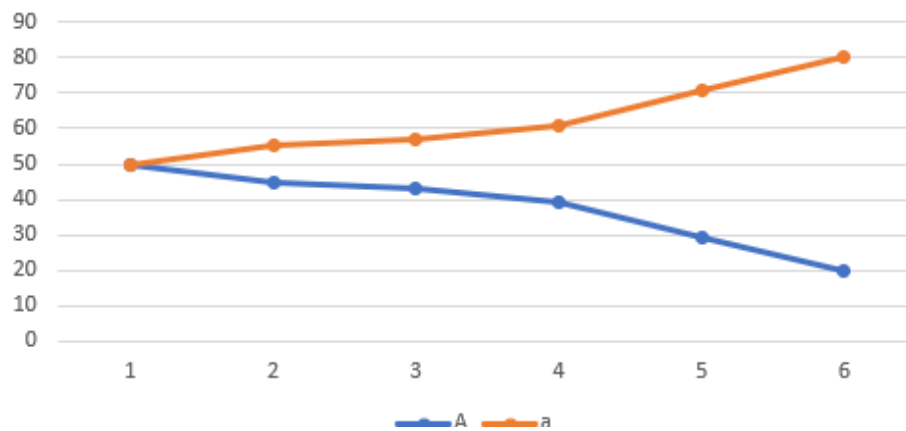
A question mark icon is visible in the bottom right corner of the content area.

	AA	Aa	aa	A	a
Gen 0 expected	12.5	25	12.5	50	50
Gen 1 observed	9	27	14	45	55
Gen 2 observed	8	27	15	43	57
Gen 3 observed	7	25	18	39	61
Gen 4 observed	5	19	26	29	71
Gen 5 observed	2	16	32	20	80

Genotypic Frequency



Allelic Frequency



Evidence for SLO 2: Various dissection units including the rat and the shark. Students pick up a kit at the beginning of the semester with all necessary materials. The LMS contains a handout, and a dissection video to aid students in completing the dissection.

The screenshot displays a Blackboard LMS interface for a course titled "Principles of Biology II". The breadcrumb trail at the top indicates the path: "Principles of Biology II > Content > Vertebrate Labs (Lab Exam 3) > Rat Dissection". The page title is "Rat Dissection".

The left-hand navigation menu includes sections for "Principles of Biology II" (Home Page, Information, Content, Discussions, Groups, Tools, Help) and "Course Management" (Control Panel, Content Collection, Course Tools, Evaluation, Grade Center, Users and Groups, Customization, Packages and Utilities, Help).

The main content area, titled "Rat Dissection", contains the following items:

- Rat Dissection Handout**: A document icon with a red lock, indicating it is locked. It is "Enabled: Statistics Tracking".
- How to skin your rat**: A video player showing a rat. The video title is "How to skin your rat". The video player shows a progress bar at 0:00 / 25:17. Below the video is a link: "Download video file: [How to skin your rat.mp4](#)".
- Skeletal Muscles**: A folder icon. It is "Enabled: Statistics Tracking".
- Internal Organs**: A folder icon. Its availability is "Item is hidden from students." and it is "Enabled: Statistics Tracking".

At the bottom right of the page, there is a help icon (a question mark in a circle).

IMG_8896.JPG Download Full screen Print Save to OneDrive

Hide email



Rat dissection



Sat 7/10/2021 11:47 PM

To: Charles Venglarik



5 attachments (2 MB)

Save all to OneDrive - Jefferson State Community College

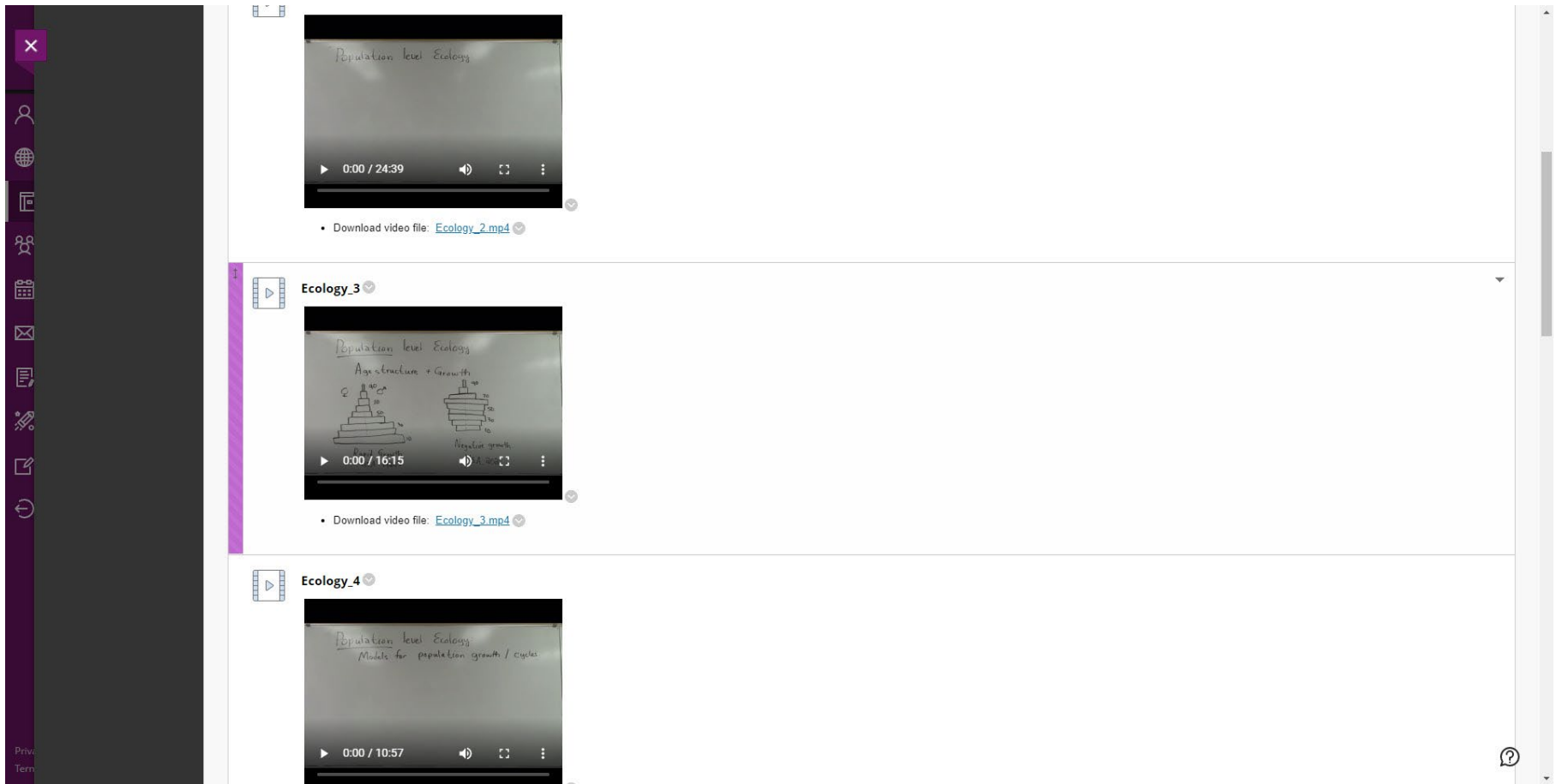
Download all

New folder

Hi Charles Venglarik, Hope ...

Inbox

Evidence for SLO 3: Expanded ecology content



The screenshot displays a video player interface with a dark purple sidebar on the left containing various icons. The main content area shows three video thumbnails, each with a play button icon and a title. The first thumbnail is titled "Population level Ecology" and has a duration of 0:00 / 24:39. Below it is a download link: "Download video file: Ecology_2.mp4". The second thumbnail is titled "Ecology_3" and has a duration of 0:00 / 16:15. Below it is a download link: "Download video file: Ecology_3.mp4". The third thumbnail is titled "Ecology_4" and has a duration of 0:00 / 10:57. The video player interface includes a progress bar, volume control, and a help icon in the bottom right corner.

Population level Ecology
0:00 / 24:39

- Download video file: [Ecology_2.mp4](#)

Ecology_3
0:00 / 16:15

- Download video file: [Ecology_3.mp4](#)

Ecology_4
0:00 / 10:57

Population level Ecology
Models for population growth / cycles



Assessment Record

Program: Biology (BIO 201)

Assessment period: Fall 2019 – Summer 2020

Program or Department Mission:

Program or Department Mission:

The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters

Course Student Learning Outcomes & Assessment Plan

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism level
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness community
4. Students will understand principles of human biology that relate to health and fitness

Course Level Student Learning Outcomes Assessed

1. Students will be able to identify the terminology used in anatomy and physiology
2. Students will be able to identify and recognize the distinct characteristics of the systems listed below
 - A. Integumentary System
 - B. Skeletal System
 - C. Muscular System
 - D. Nervous System
3. Students will recognize the relationship between structural organization and function
4. Student will define homeostasis and identify the role of homeostasis within and between appropriate systems
5. Students will identify the major structures of each system
 - A. Integumentary System
 - B. Skeletal System
 - C. Muscular System
 - D. Nervous System

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence			Use of Results
SLO 1: Identify the terminology used in anatomy and physiology	Student learning outcomes were assessed by using a 16 question standardized multiple choice examination at the end of the semester . A total of 2 questions (Q2 and Q3) were	Correct responses by 70% of the students for each SLO will be defined as a successful outcome.	Fall 2019	Jefferson	# students tested = 123 # correct = 203 % correct = 83%	The students tested did meet the requirements for success for SLO 1. The success rate for SLO 1 is 79% which is consistent with the data from last year where the
				Shelby	# students tested = 212 # correct = 352 % correct = 83%	
				Clanton	# students tested = 81 # correct = 119 % correct = 73%	
				Pell City	# students tested = 64 # correct = 74 % correct = 58%	
			Summer 2020	Jefferson	# students tested = 51 # correct = 93 % correct = 91%	
				Shelby	# students tested = 77	

	used to assess SLO1				<table border="1"> <tr> <td></td> <td></td> <td># correct = 120 % correct = 78%</td> </tr> <tr> <td></td> <td>Clanton</td> <td># students tested =14 # correct = 24 % correct = 86%</td> </tr> </table> <p>Total Students Tested = 622 Total Annual Success Rate = 79%</p>			# correct = 120 % correct = 78%		Clanton	# students tested =14 # correct = 24 % correct = 86%	<p>rate of success was 79%</p> <p>We will continue to use vocabulary terms throughout each chapter to reinforce the regional and directional terms. Faculty will emphasize the relationship between structure and function. As with our other course offerings, we will also work to make materials available to students online throughout the semester.</p>		
		# correct = 120 % correct = 78%												
	Clanton	# students tested =14 # correct = 24 % correct = 86%												
<p>SLO 2: Identify and recognize the distinct characteristics of the systems listed below</p> <p>A. Integumentary System B. Skeletal System</p>	<p>Student learning outcomes were assessed by using a 16 question standardized multiple choice</p>	<p>Correct responses by 70% of the students for each SLO will be defied as a</p>	<table border="1"> <tr> <td>Fall 2019</td> <td>Jefferson</td> <td># students tested = 123 # correct = 343 % correct = 70%</td> </tr> <tr> <td></td> <td>Shelby</td> <td># students tested = 212 # correct = 654 % correct = 77%</td> </tr> <tr> <td></td> <td>Clanton</td> <td># students tested = 81 # correct = 244</td> </tr> </table>	Fall 2019	Jefferson	# students tested = 123 # correct = 343 % correct = 70%		Shelby	# students tested = 212 # correct = 654 % correct = 77%		Clanton	# students tested = 81 # correct = 244		<p>The students tested met the requirements for success for SLO 2.</p>
Fall 2019	Jefferson	# students tested = 123 # correct = 343 % correct = 70%												
	Shelby	# students tested = 212 # correct = 654 % correct = 77%												
	Clanton	# students tested = 81 # correct = 244												

<p>C. Muscular System D. Nervous System</p>	<p>examination at the end of the semester. A total of 4 questions (Q5, Q8, Q11, and Q14) were used to assess SLO2</p>	<p>successful outcome.</p>	<table border="1" data-bbox="905 134 1648 618"> <tr> <td></td> <td></td> <td>% correct = 75%</td> </tr> <tr> <td></td> <td>Pell City</td> <td># students tested = 64 # correct = 169 % correct = 66%</td> </tr> <tr> <td>Summer 2020</td> <td>Jefferson</td> <td># students tested = 51 # correct = 197 % correct = 97%</td> </tr> <tr> <td></td> <td>Shelby</td> <td># students tested = 77 # correct = 273 % correct = 89%</td> </tr> <tr> <td></td> <td>Clanton</td> <td># students tested = 14 # correct = 53 % correct = 95%</td> </tr> </table> <p>Total Students Tested = 622 Total Annual Success Rate = 78%</p>			% correct = 75%		Pell City	# students tested = 64 # correct = 169 % correct = 66%	Summer 2020	Jefferson	# students tested = 51 # correct = 197 % correct = 97%		Shelby	# students tested = 77 # correct = 273 % correct = 89%		Clanton	# students tested = 14 # correct = 53 % correct = 95%	<p>The success rate for SLO 2 78% which represents an increase from last years rate of success (73%)</p> <p>We hypothesize the methods described below, stressing details in lecture and lab and making materials available online were effective in increasing student learning examined through SLO 2.</p> <p>We will continue to stress the <u>details of each organ system in both lecture and lab</u> throughout the semester. We will also work <u>to make materials available online to the students</u></p>
		% correct = 75%																	
	Pell City	# students tested = 64 # correct = 169 % correct = 66%																	
Summer 2020	Jefferson	# students tested = 51 # correct = 197 % correct = 97%																	
	Shelby	# students tested = 77 # correct = 273 % correct = 89%																	
	Clanton	# students tested = 14 # correct = 53 % correct = 95%																	

						<u>throughout the semester.</u>
SLO 3: Recognize the relationship between structural organization and function	Student learning outcomes were assessed by using a 16 question standardized multiple choice examination at the end of the semester . A total of 4 question (Q1, Q7, Q9, Q13) was used to assess SLO3	Correct responses by 70% of the students for each SLO will be defined as a successful outcome.	Fall 2019	Jefferson	# students tested = 123 # correct = 275 % correct = 56%	The students tested did not meet the requirements for success for SLO 3. The success rate for SLO 3 is 63%, which while below the threshold for success, is a significant increase from last years rate of success (54%). We will continue to stress the relationship of structure and function in both lecture and lab . We also noticed that one of the questions for our assessment has a
				Shelby	# students tested = 212 # correct = 476 % correct = 56%	
				Clanton	# students tested = 81 # correct = 220 % correct = 68%	
				Pell City	# students tested = 64 # correct = 130 % correct = 51%	
			Summer 2020	Jefferson	# students tested = 51 # correct = 159 % correct = 78%	
				Shelby	# students tested = 77 # correct = 251 % correct = 81%	
				Clanton	# students tested = 14 # correct = 49 % correct = 89%	

						<p>significantly lower rate of success, suggesting it may be problematic. We will evaluate other potential questions to replace that question in the assessment.</p>																					
<p>SLO 4: Define homeostasis and identify the role of homeostasis within and between appropriate systems</p>	<p>Student learning outcomes were assessed by using a 16 question standardized multiple choice examination at the end of the semester. A total of 2 questions (Q15 and Q16) were used to assess SLO4</p>	<p>Correct responses by 70% of the students for each SLO will be defined as a successful outcome.</p>	<table border="1"> <tr> <td data-bbox="890 610 1073 721">Fall 2019</td> <td data-bbox="1073 610 1255 721">Jefferson</td> <td data-bbox="1255 610 1646 721"># students tested = 123 # correct = 219 % correct = 89%</td> </tr> <tr> <td data-bbox="890 721 1073 831"></td> <td data-bbox="1073 721 1255 831">Shelby</td> <td data-bbox="1255 721 1646 831"># students tested = 212 # correct = 374 % correct = 88%</td> </tr> <tr> <td data-bbox="890 831 1073 941"></td> <td data-bbox="1073 831 1255 941">Clanton</td> <td data-bbox="1255 831 1646 941"># students tested = 81 # correct = 132 % correct = 81%</td> </tr> <tr> <td data-bbox="890 941 1073 1052"></td> <td data-bbox="1073 941 1255 1052">Pell City</td> <td data-bbox="1255 941 1646 1052"># students tested = 64 # correct = 70 % correct = 55%</td> </tr> <tr> <td data-bbox="890 1052 1073 1162">Summer 2020</td> <td data-bbox="1073 1052 1255 1162">Jefferson</td> <td data-bbox="1255 1052 1646 1162"># students tested = 51 # correct = 97 % correct = 95%</td> </tr> <tr> <td data-bbox="890 1162 1073 1273"></td> <td data-bbox="1073 1162 1255 1273">Shelby</td> <td data-bbox="1255 1162 1646 1273"># students tested = 77 # correct = 144 % correct = 94%</td> </tr> <tr> <td data-bbox="890 1273 1073 1383"></td> <td data-bbox="1073 1273 1255 1383">Clanton</td> <td data-bbox="1255 1273 1646 1383"># students tested = 13 # correct = 28 % correct = 100%</td> </tr> </table> <p>Total Students Tested = 622 Total Annual Success Rate = 86%</p>			Fall 2019	Jefferson	# students tested = 123 # correct = 219 % correct = 89%		Shelby	# students tested = 212 # correct = 374 % correct = 88%		Clanton	# students tested = 81 # correct = 132 % correct = 81%		Pell City	# students tested = 64 # correct = 70 % correct = 55%	Summer 2020	Jefferson	# students tested = 51 # correct = 97 % correct = 95%		Shelby	# students tested = 77 # correct = 144 % correct = 94%		Clanton	# students tested = 13 # correct = 28 % correct = 100%	<p>The students tested did meet the requirements for success for SLO 4.</p> <p>The success rate for SLO 4 is 86% which is consistent with the rate of success from last year.</p> <p>We will continue to stress the importance of homeostasis in</p>
Fall 2019	Jefferson	# students tested = 123 # correct = 219 % correct = 89%																									
	Shelby	# students tested = 212 # correct = 374 % correct = 88%																									
	Clanton	# students tested = 81 # correct = 132 % correct = 81%																									
	Pell City	# students tested = 64 # correct = 70 % correct = 55%																									
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	Shelby	# students tested = 77 # correct = 144 % correct = 94%																									
	Clanton	# students tested = 13 # correct = 28 % correct = 100%																									

					each organ system.	
<p>SLO 5: Identify the major structures of each system</p> <p>A.Integumentary System</p> <p>B.Skeletal System</p> <p>C.Muscular System</p> <p>D.Nervous System</p>	<p>Student learning outcomes were assessed by using a 16 question standardized multiple choice examination at the end of the semester. A total of 4 questions (Q4, Q6, and Q10, Q12) were used to assess SLO5</p>	<p>Correct responses by 70% of the students for each SLO will be defined as a successful outcome.</p>	Fall 2019	Jefferson	# students tested = 123 # correct = 364 % correct = 74%	<p>The students tested did meet the requirements for success for SLO 5.</p> <p>The success rate for SLO 5 is 78% which is slightly higher than the rate of success last year (76%).</p> <p>We will continue to emphasize the major structures of each organ system and focus on the relationship between structure and function. We will also make materials available online throughout the semester.</p>
				Shelby	# students tested = 212 # correct = 656 % correct = 77%	
				Clanton	# students tested = 81 # correct = 246 % correct = 76%	
				Pell City	# students tested = 64 # correct = 187 % correct = 73%	
			Summer 2020	Jefferson	# students tested = 51 # correct = 175 % correct = 86%	
				Shelby	# students tested = 77 # correct = 252 % correct = 82%	
				Clanton	# students tested = 14 # correct = 55 % correct = 98%	
			<p>Total Students Tested = 622 Total Annual Success Rate = 78%</p>			

Plan submission date:

Submitted by:

BIO 201 MW 10am Course Outline-Fall 2019

****Tentative and Subject to Change****

Date	Monday Lecture	Lab (Mon)	Date	Wednesday Lecture
8/19	Class Policies and Introduction Intro To Anatomy-CH1	NO LAB	8/21	Intro To Anatomy & Anatomical Terminology -CH1
8/26	Chemistry-Ch2	Microscope Histology	8/28	Histology-Ch 4 Vocab Quiz #1 (a- to den-)
9/2	NO CLASS Labor Day	Torso Model	9/4	Integumentary System (Ch5) Lecture Quiz #1
9/9	Integumentary System (Ch5) Lab Quiz #1-Histology	Fetal Pig Dissection	9/11	Lecture Exam #1
9/16	Bones and Skeletal Tissue (Ch 6)	Lab Exam #1	9/18	Joints (Ch8) (Ch 7)
9/23	Skull	Bones	9/25	Skull Lecture Quiz #2
9/30	Appendicular Skeleton	Bones	10/2	Appendicular Skeleton Vocab Quiz #2 (dendro- to kerato-)
10/7	Axial Skeleton	Bones	10/9	Axial Skeleton Lab Quiz #2-Bones of hands and feet
10/14	Lecture Exam #2	Skeleton Review	10/16	Lab Exam #2 During Lecture Period
10/21	Muscular System 1 Ch 10	Muscles-face, back, head, neck,torso	10/23	Muscular System 2 Ch 10 Vocab Quiz #3 (kine- to philo)
11/28	Muscular System 3	Muscles of Upper Limb Handout Lab Quiz	11/30	Muscles 4

Syllabus from BIO 201 course showing vocabulary assignments throughout the semester.

SLO 1- BB Shell showing quizlets to reinforce both regional and directional terms. All Blackboard material is available throughout the semester.

Human Anatomy Physiology I Learning Modules Unit 1 (ch 1, 3, 5) Animations/videos

Success: Anatomical Terminology quizlet edited.

Human Anatomy Physiology I





- Home Page
- Course Content
- Syllabus
- My Grades
- Assignments
- Discussions
- Groups
- Tools
- Help
- Announcements
- Calendar
- Learning Modules
- Information
- Content

Table of Contents

- 1. 201 Unit 1 notes
 - 2. PDF lectures (printing)
 - 2.1. Chapter 1 Part A
 - 2.2. ch 1 organization
 - 2.3. Chapter 1 part B
 - 2.4. ch1b anatomical
 - 2.5. ch 2 Biochemistry
 - 2.6. Ch 2 Biochemistr
 - 2.7. ch 2 Biochemistry
 - 2.8. ch 3a Cells: Mem
 - 2.9. ch 3b Cells: Acti
 - 2.10. ch 3c Cells: Org
 - 2.11. ch 4a Tissues: E
 - 2.12. ch 4b Tissues: C
 - 2.13. ch 4c Tissues: M
 - 3. Animations/videos
 - 3.1. homeostasis
 - 3.2. negative feedback
 - 3.3. regional terms pr
 - 3.4. Anatomical Term
 - 3.5. diffusion
 - 3.6. facilitated passive

Animations/videos

Build Content Assessments Tools Partner Content

-  [homeostasis](#)
-  [negative feedback and homeostasis](#)
-  [regional terms practice](#)
-  [Anatomical Terminology quizlet](#)
Atlas A terms to prepare you for the Anatomical Term quiz

Slides from lecture showing relationship between bone structure and function.

Bones-swindall (3) [Compatibility Mode] - PowerPoint

File Home Insert Design Transitions Animations Slide Show Review View Tell me what you want to do...

Normal Outline Slide Sorter Notes Reading Slide Handout Notes Master Master Notes Zoom Zoom Fit to Window Window Window Macros

Color Grayscale Black and White New Window Move Split Switch Windows Macros

13

cartilage here.
Cartilage grows here.
Bone replaces cartilage here.

Bone that was here has been resorbed.

Appositional growth adds bone here.

Bone that was here has been resorbed.

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14

- Increases calcium and phosphate absorption in the GI tract
- Blood calcium
 - PTH (parathyroid hormone)
 - Increases blood calcium
 - Calcitonin
 - Creates calcium deposits, decreasing blood calcium

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15

Bones stresses when weight bears on them or muscles pull on them

- Usually off center so tends to bend bones
- Bending compresses on one side; stretches on other

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16

Figure 6.15 Bone anatomy and bending stress.

Load here (body weight)

Head of femur

Tension here

Point of no stress

Compression here

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17

Results of Mechanical Stressors: Wolff's Law

- Bones grow or remodel in response to demands placed on it
- Explains
 - Handedness (right or left handed) results in thicker and stronger bone of that upper limb
 - Curved bones thickest where most likely to buckle
 - Trabeculae form trusses along lines of stress
 - Large, bony projections occur where heavy, active muscles attach
 - Bones of fetus and bedridden featureless

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Figure 6.14 Vigorous exercise can strengthen bone.

(a)

(b)

Serving arm

Nonserving arm

Cross-sectional dimension of the humerus

Added bone matrix counteracts added stress

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Blackboard shell showing all lecture material available to students online.

The screenshot displays a Blackboard course shell for 'Human Anatomy Physiology I'. The left sidebar contains navigation options: Home Page, Course Materials, Mastering A&P, Discussions, Tools, and Help. The main content area is titled 'Exam #1 Lectures' and lists the following materials:

- Intro to Anatomy**
Attached Files: [Lecture 1-Intro to Anatomy-F16.ppt](#) (3.869 MB)
- Anatomical Terminology**
Attached Files: [Lecture 3 - Anatomical Terminology.ppt](#) (1.664 MB)
- Chemistry**
Attached Files: [Chemistry-Fall2019.pptx](#) (7.415 MB)
- Microscope Intro**
This is the video you will watch for the "Microscope Learning Module" for this week. This will help you to be ready for our Lab on 9/1.
- Histology**
Attached Files: [Histology Ch4-AFS \(1\)-fall 2015.ppt](#) (6.698 MB)
- Integumentary System**
- Exam #1 Study Guide**
Attached Files: [201 Exam #1 Study Guide .docx](#) (13.855 KB)

BIO 201 MW 10am Course Outline-Fall 2019

****Tentative and Subject to Change****

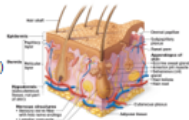
Date	Monday Lecture	Lab (Mon)	Date	Wednesday Lecture
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8/26	Chemistry-Ch2	Microscope Histology	8/28	Histology-Ch 4 Vocab Quiz #1 (a- to den-)
9/2	NO CLASS Labor Day	Torso Model	9/4	Integumentary System (Ch5) Lecture Quiz #1
9/9	Integumentary System (Ch5) Lab Quiz #1-Histology	Fetal Pig Dissection	9/11	Lecture Exam #1
9/16	Bones and Skeletal Tissue (Ch 6)	Lab Exam #1	9/18	Joints (Ch8) (Ch 7)
9/23	Skull	Bones	9/25	Skull Lecture Quiz #2
9/30	Appendicular Skeleton	Bones	10/2	Appendicular Skeleton Vocab Quiz #2 (dendro- to kerato-)
10/7	Axial Skeleton	Bones	10/9	Axial Skeleton Lab Quiz #2-Bones of hands and feet
10/14	Lecture Exam #2	Skeleton Review	10/16	Lab Exam #2 During Lecture Period
10/21	Muscular System 1 Ch 10	Muscles-face, back, head, neck,torso	10/23	Muscular System 2, Ch 10 Vocab Quiz #3 (kine- to philo)
11/28	Muscular System 3	Muscles of Upper Limb Handout Lab Quiz	11/30	Muscles 4
11/4	Muscles Review Take Home Lab Quiz # 3 Due Origin, Insertion, Action	Muscles of the Lower Limb	11/6	Lecture Exam #3
11/11	NO CLASS Veteran's Day	No Lab	11/13	Lab Exam #3 During Lecture Period
11/18	Nervous Systems Part 2	Brain Dissection	11/20	Nervous Systems Part 3 Vocab Quiz #4 (phobo- to zygo)
11/25	Thanksgiving Break	No Lab	11/27	Thanksgiving Break
12/2	Nervous Systems Part 4/5	Eye and Ear	12/4	Nervous Systems Part 6
12/9	No Class	No Lab	12/11	Final Exam 10:30-12:30

Syllabus showing lecture and lab schedule covering organ systems.

SLO 2 - Example of PowerPoint from Integumentary system showing details for this system.

Epidermis

- Keratinized stratified squamous epithelium
- Four or five distinct layers
 - Stratum basale
 - Stratum spinosum
 - Stratum granulosum
 - Stratum lucidum (only in thick skin)
 - Stratum corneum
- Four cell types
 - Keratinocytes
 - Melanocytes
 - Dendritic (Langerhans) cells
 - Tactile (Merkel) cells



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Superficial

5. Stratum corneum
Dead cells with a hard protein envelope; the cells contain keratin and are surrounded by lipids.

4. Stratum lucidum
Dead cells containing dispersed keratohyalin.

3. Stratum granulosum
Keratohyalin and a hard protein envelope form; lamellar bodies release lipids; cells die.

2. Stratum spinosum
Keratin fibers and lamellar bodies accumulate.

1. Stratum basale
Cells divide by mitosis and some of the newly formed cells become the cells of the more superficial strata.

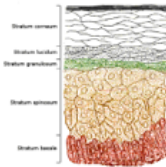
Deep

Intercellular lipids
Keratin
Lamellar body releases lipids
Protein envelope
Keratohyalin granules
Lipid-filled lamellar body
Keratin fiber
Desmosome
Nucleus
Hemidesmosome
Basement membrane

4

Layers of the Epidermis: Stratum Granulosum (Granular Layer)

- Thin - four to six cell layers
- Cell appearance changes
 - Cells flatten
 - Nuclei and organelles disintegrate
 - Keratinization begins
 - Cells accumulate keratohyaline granules
 - Cell accumulate lamellar granules
- Cells above this layer die
 - Too far from dermal capillaries

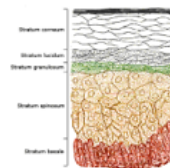


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8

Layers of the Epidermis: Stratum Lucidum (Clear Layer)

- Only in thick skin
- Thin, translucent band superficial to the stratum granulosum
- A few rows of flat, dead keratinocytes



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9

Layers of the Dermis: Papillary Layer

- Areolar connective tissue with collagen and elastic fibers and blood vessels
- Loose tissue
 - Phagocytes can patrol for microorganisms
- **Dermal papillae**
 - Superficial peglike projections

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13

Dermal Papillae

- In thick skin lie atop dermal ridges that cause epidermal ridges
 - Collectively ridges called friction ridges
 - Enhance gripping ability
 - Contribute to sense of touch
 - Pattern is fingerprints



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14

Blackboard shell showing all lecture material available to students online.

The screenshot displays a Blackboard course shell for 'Human Anatomy Physiology I'. The top navigation bar includes 'Human Anatomy Physiology I', 'Course Materials', and 'Exam #1 Lectures'. A left-hand sidebar contains navigation options: Home Page, Course Materials, Mastering A&P, Discussions, Tools, and Help. The main content area is titled 'Exam #1 Lectures' and lists several items:

- Intro to Anatomy**: Attached Files: [Lecture 1-Intro to Anatomy-F16.ppt](#) (3.869 MB)
- Anatomical Terminology**: Attached Files: [Lecture 3 - Anatomical Terminology.ppt](#) (1.664 MB)
- Chemistry**: Attached Files: [Chemistry-Fall2019.pptx](#) (7.415 MB)
- Microscope Intro**: This is the video you will watch for the "Microscope Learning Module" for this week. This will help you to be ready for our Lab on 9/1.
- Histology**: Attached Files: [Histology Ch4-AFS \(1\)-fall 2015.ppt](#) (6.698 MB)
- Integumentary System**
- Exam #1 Study Guide**: Attached Files: [201 Exam #1 Study Guide .docx](#) (13.855 KB)

SLO 3: - BIO Dept Meeting Summary showing discussion to update and reassess SLO questions for BIO 201.

**SLO Meeting Summary
2019**

In Attendance: Erin Arnold, Martha Ross, Amanda Swindall, [Nic Kin](#), [Chuck Venglarik](#), Stephanie Miller, [Julie Maharrey](#), Courtney Petty

BIO 101: Discussed incorporating virtual dissection and dissection videos to improve SLO 3

BIO 102: Discussed incorporating videos of dissections and online interactive dissections

BIO 103: Consider new textbook, incorporated labs that are more relevant to 21st century biology (ie jellyfish gene). Training and usage of Vernier probes

BIO 104: Incorporate more in class discussion, discuss current topics, incorporate videos

BIO 201: update and reassess some questions

BIO 202: No change

BIO 220: evaluate q 2 and q 3 of assessment

SLO 4: - Lecture notes from 201 showing homeostasis and application to all organ systems.

Homeostasis


- A dynamic process that enables the body to maintain "balanced" conditions in the face of internal or external change.
 - Blood Glucose
 - Body Temperature
 - Blood Pressure and Volume

Homeostatic Control Systems

- Just like the thermostat in your house. Mechanisms must start and stop to maintain the correct temperature (body conditions).
- Two types of systems
 - Negative Feedback
 - Positive Feedback

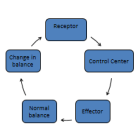
Homeostasis: What is that?

- The body's attempt to keep everything at "normal."
 - Normal temperature
 - Normal hydration levels
 - Normal blood sugar levels
- Every organ is involved in homeostasis.
- Communication between organ systems is accomplished mainly by the nervous and endocrine systems.

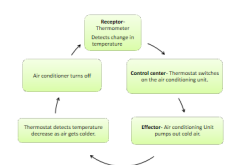


Components of Homeostasis

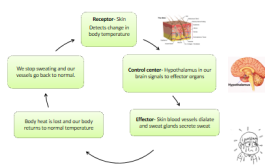
- Receptor:** senses changes in system and tells control center.
- Control Center:** receives message from receptor and tells effector to fix problem.
- Effector:** receives command from control center and acts to bring everything back to normal.



Home Thermostat




Our body: Thermoregulation



Lecture Notes from BIO 201 showing bone homeostasis being discussed.

13



14

Hormonal Control of Bone Growth

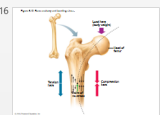
- Human Growth Hormone
- Estrogen/Testosterone \pm
- Calcitriol
 - Increases calcium and phosphate absorption in the GI tract
- Blood calcium
 - PTH (parathyroid hormone)
 - Increases blood calcium
 - Calcitonin
 - Decreases calcium output, decreasing blood calcium

15

Bone Homeostasis: Response to Mechanical Stress

- Bones reflect stresses they encounter
 - Long bones thickest midway along diaphysis where bending stresses greatest
 - Bones stressed when weight bears on them or muscles pull on them
 - Usually off center so tends to bend bones
 - Bending compresses on one side; stretches on other

16



17

Results of Mechanical Stressors: Wolff's Law

- Bones grow or remodel in response to demands placed on it

Bone Homeostasis: Response to Mechanical Stress

- Bones reflect stresses they encounter
 - Long bones thickest midway along diaphysis where bending stresses greatest
 - Bones stressed when weight bears on them or muscles pull on them
 - Usually off center so tends to bend bones
 - Bending compresses on one side; stretches on other

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Assignment showing “Emphasize the major structures of each organ system”

Students are required to complete 4 sets of anatomical drawings that stress the importance of the major structures in each organ system as we cover them in class.

Anatomy Drawings Unit 1

Studies have shown that drawing, labelling and coloring in anatomical structures can lead to a greater familiarity with the structures and therefore a better grade on exams. Each unit you will have a selection of structures that you must draw, color and label. You do not have to draw freehand – you may also trace from an image in your book or that you find online. But you CAN NOT just print something out from the internet and turn it in for credit. This drawing unit is worth 25 points total.

General Orientation:

Draw and label the following:

Anatomical planes – frontal, median/midsagittal, sagittal, transverse

Anatomical regions (ventral) – acromial, axillary, brachial, cubital, antebrachial, carpal, palmar, coxal, patellar, cephalic, facial, cervical, sternal, pectoral, umbilical, abdominal, inguinal, pubic, femoral, crural, tarsal, pedal

Anatomical regions (dorsal) – cranial, nuchal, interscapular, scapular, vertebral, lumbar, sacral, gluteal, perineal, femoral, popliteal, crural, tarsal, calcaneal

The Human Torso:

Draw, color, and label the following structures from the human torso

The brain, carotid artery, jugular vein, thyroid, larynx, trachea, bronchi, esophagus, heart, lungs, diaphragm, liver, gallbladder, stomach, pancreas, spleen, small intestines, greater omentum, large intestines, rectum, kidneys, ureters, urethra, urinary bladder

The Cell:

Draw and color a typical human cell and label the following


cell membrane, nucleus, nucleolus, mitochondria, ribosomes, golgi body, lysosomes, peroxisomes, rough endoplasmic reticulum, smooth endoplasmic reticulum, microvilli, microfilaments, microtubules, intermediate filaments





Blackboard shell showing lecture notes available for each exam.



The screenshot displays the Blackboard course shell for "Human Anatomy Physiology I". The left-hand navigation menu includes sections for "Human Anatomy Physiology I" (with sub-items like Home Page, Course Materials, Mastering A&P, Information, Content, Discussions, Groups, Tools, Help, and Financial Aid Participation Verification) and "Course Management" (with sub-items like Control Panel, Content Collection, Course Tools, Evaluation, Grade Center, Users and Groups, Customization, Packages and Utilities, and Help). The main content area is titled "Course Materials" and features a sub-menu with "Build Content", "Assessments", "Tools", and "Partner Content". Below this, a list of folders is shown, each with a folder icon and a description:



- Introductory Materials**: This folder includes all the handouts received the first class period including: syllabus, vocabulary, and app information.
- Exam #1 Lectures**: All information covered on Exam 1 is in this folder. You will use these powerpoints to follow along with the Tegrity lectures.
- Exam #2 Lectures**
- Exam #3 Lectures**
- Final Exam Lectures**
- Lab Resources**
- Helpful Study Websites**: I have included a couple of links to excellent resources for help with topics we are covering in class.



Blackboard shell showing recorded lectures available throughout the semester.



Recorded Lectures 



Build Content  Assessments  Tools  Partner Content 

 **Intro to the Human Body** 
Enabled: Statistics Tracking

 **The Cellular Level of Organization** 
Enabled: Statistics Tracking

 **Tissue Level of Organization - Part 1** 
Enabled: Statistics Tracking

 **Tissue Level of Organization - Part 2** 
Enabled: Statistics Tracking

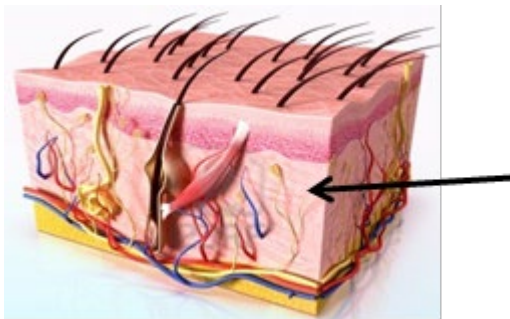
 **Integumentary System** 
Enabled: Statistics Tracking

Biology 201 Comprehensive Survey

1. **(SLO3A)** _____ is a group of cells that are similar in structure and perform a common function.
 - a. Organ
 - b. Organelle
 - c. Tissue
 - d. System
 - e. Organism

2. **(SLO1A)** Based on what you know about anatomical terminology, the term subcutaneous means _____?
 - a. The study of the skin
 - b. Break down the skin
 - c. Below the skin
 - d. Around the skin

3. **(SLO1B)** The ear is _____ to the eye.
 - a. Superior
 - b. Medial
 - c. Inferior
 - d. Lateral
 - e. Anterior



4. **(SLO5A)** The arrow is pointing to the _____ layer of the skin.
 - a. Hypodermis
 - b. Dermis

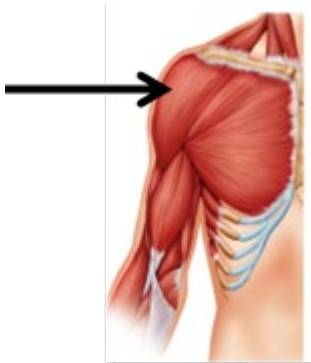
- c. Epidermis
- d. Subcutaneous fat
- e. Areolar

5. **(SLO2A)** The cell that produces melanin is called
- a. Keratinocyte
 - b. Melanocyte
 - c. Melanogenic cell
 - d. Dendritic cell
 - e. Chondroblast



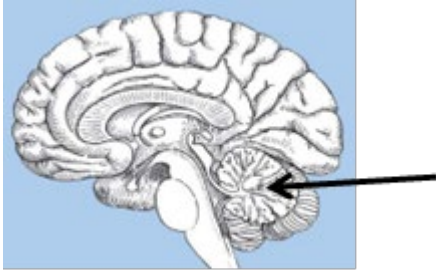
6. **(SLO5B)** The above bone is called the
- a. Femur
 - b. Humerus
 - c. Radius
 - d. Tibia
 - e. Fibula

7. **(SLO3B)** In the sliding filament model of muscle contraction, the cross bridge cycle occurs when the myosin head binds to the active site on _____.
- a. Sarcoplasmic Reticulum
 - b. Actin
 - c. Sarcomere
 - d. Troponin
 - e. Calcium
8. **(SLO2B)** The cell type responsible for building bone is _____.
- a. Myocyte
 - b. Chondrocyte
 - c. Osteoclast
 - d. Osteoblast
9. **(SLO3)** The triceps brachii is the antagonist for the
- a. Orbicularis oculi
 - b. Palmaris longus
 - c. Soleus
 - d. Biceps brachii



10. **(SLO5C)** The muscle the arrow is pointing to is the
- a. Biceps femoris
 - b. Deltoid
 - c. Pectoralis minor
 - d. Biceps brachii
 - e. Trapezius

11. (SLO2C) The neurotransmitter released at the neuromuscular junction for skeletal muscle contraction is _____.
- Acetylcholine (ACh)
 - Dopamine
 - Acetylcholinesterase (AChE)
 - Myosin



12. (SLO5D) The arrow is pointing to which structure in the brain?
- Corpus callosum
 - Cerebellum
 - Midbrain
 - Pons
 - Thalamus
13. (SLO3C) The pelvic girdle lacks the mobility of the _____, but is far more stable due to the acetabulum and strong ligaments.
- Radius and ulna
 - Vertebral column
 - Pectoral girdle
 - Pubic bone
14. (SLO2D) There are _____ pairs of cranial nerves.
- 2
 - 7
 - 12
 - 31
15. (SLO4) _____ is the ability of the body to maintain stable internal conditions.
- Refraction
 - Regeneration

- c. Maximum potential
- d. Homeostasis

16. (SLO4) Which of the following is NOT one of the 3 parts of a feedback loop?

- a. Centriole
- b. Effector
- c. Control center
- d. Receptor
- e. Effector



Assessment Record

Program: Biology (BIO 202)

Assessment period: Fall 2019- Summer 2020

Program or Department Mission:

Program or Department Mission:

The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters.

Course Student Learning Outcomes & Assessment Plan

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism level
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness community
4. Students will understand principles of human biology that relate to health and fitness

Course Level Student Learning Outcomes Assessed

1. Students will define and describe the systems listed below.
 - A. Endocrine System
 - B. Cardiovascular System
 - C. Lymphatic and Immune System
 - D. Respiratory System
 - E. Digestive System
 - F. Urinary System
 - G. Reproductive System
2. Students will define homeostasis and identify the role of homeostasis within and between appropriate systems.
3. Students will be able to recognize the major structures of each system listed below.
 - A. Endocrine System
 - B. Cardiovascular System
 - C. Lymphatic and Immune System
 - D. Respiratory System
 - E. Digestive System
 - F. Urinary System
 - G. Reproductive System

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence			Use of Results
1: Define and describe the systems listed below. <ol style="list-style-type: none"> A. Endocrine System B. Cardiovascular System C. Lymphatic and Immune System D. Respiratory System E. Digestive System F. Urinary System G. Reproductive System 	Student learning outcomes were assessed by using a 12 question standardized multiple choice examination at the end of the semester. A total of five questions (Q2,	70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions	Fall 2019	Jefferson	# students tested = 47 #correct = 165 % correct = 70%	The students tested did meet the requirements for success for SLO 1. The success rate for SLO 1 is 75% which is a slight increase in the rate of success
				Shelby	# students tested = 119 #correct = 440 % correct = 74%	
				Clanton	# students tested = 22 #correct = 58 % correct = 53%	
				Pell City	# students tested = 30 #correct = 110 % correct = 73%	
			Summer 2020	Jefferson	# students tested = 43 #correct = 185 % correct = 86%	

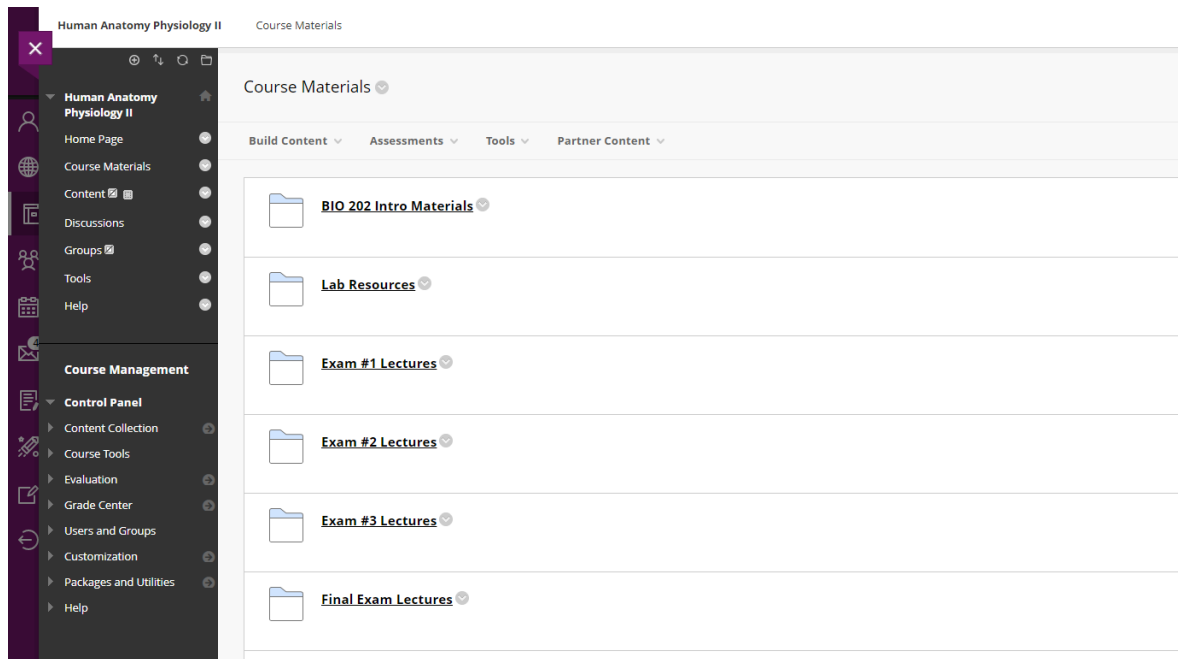
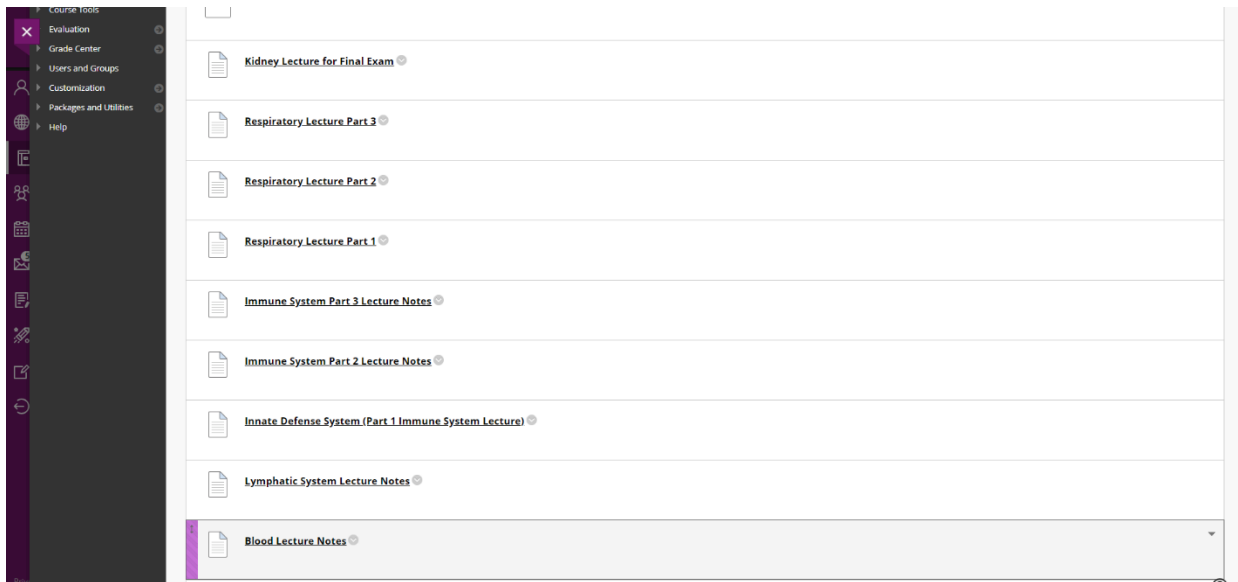
	Q4, Q7, Q8, Q12) were used to assess SLO1.	related to SLO 1.	<table border="1"> <tr> <td data-bbox="940 131 1121 250"></td> <td data-bbox="1121 131 1304 250">Shelby</td> <td data-bbox="1304 131 1709 250"># students tested = 52 #correct = 211 % correct = 81%</td> </tr> <tr> <td data-bbox="940 250 1121 358"></td> <td data-bbox="1121 250 1304 358">Clanton</td> <td data-bbox="1304 250 1709 358"># students tested = 15 #correct = 67 % correct = 89%</td> </tr> </table>		Shelby	# students tested = 52 #correct = 211 % correct = 81%		Clanton	# students tested = 15 #correct = 67 % correct = 89%	<p>from last year (73%).</p> <p>We will work to provide students with materials that they can access at home.</p> <p>As a department we noticed a distinct trend, where students learning objective mastery increased with the transition to online learning. This could be due to continual access to course materials and lectures, and the student being able to continually review material in order to master the learning</p>
	Shelby	# students tested = 52 #correct = 211 % correct = 81%								
	Clanton	# students tested = 15 #correct = 67 % correct = 89%								
<p>Total Students Tested = 328 Total Annual Success Rate = 75%</p>										

						outcome information.
<p>2: Define homeostasis and identify the role of homeostasis within and between appropriate systems.</p> <p>A. Endocrine System</p>	<p>Student learning outcomes were assessed by using a 12 question standardized multiple choice examination at the end of the semester. A total of 2 questions (Q1 and Q6) were used to assess SLO2.</p>	<p>70% or > successful</p> <p>69% or < unsuccessful</p> <p>The percent is based upon the average of correctly answered questions related to SLO2.</p>	Fall 2019	Jefferson	# students tested = 47 #correct = 76 % correct = 81%	<p>The students tested did meet the requirements for success for SLO 2.</p> <p>The success rate for SLO 2 is 85% which is a slight increase in success from last year (81%).</p> <p>We will continue to stress the importance of homeostasis in each chapter and with each organ system.</p>
				Shelby	# students tested = 119 #correct = 198 % correct = 83%	
				Clanton	# students tested = 22 #correct = 28 % correct = 64%	
				Pell City	# students tested = 47 #correct = 47 % correct = 78%	
			Summer 2020	Jefferson	# students tested = 43 #correct = 84 % correct = 98%	
				Shelby	# students tested = 52 #correct = 93 % correct = 89%	
				Clanton	# students tested = 15 #correct = 30 % correct = 100%	
			<p>Total Students Tested = 328 Total Annual Success Rate = 85%</p>			
<p>3: Recognize the major structures of each system listed below.</p> <p>A. Endocrine System</p>	<p>Student learning outcomes were assessed by using a 12</p>	<p>70% or > successful</p> <p>69% or < unsuccessful</p>	Fall 2019	Jefferson	# students tested = 47 #correct = 207 % correct = 88%	<p>The students tested did meet the requirements for</p>
				Shelby	# students tested = 119 #correct = 491 % correct = 83%	

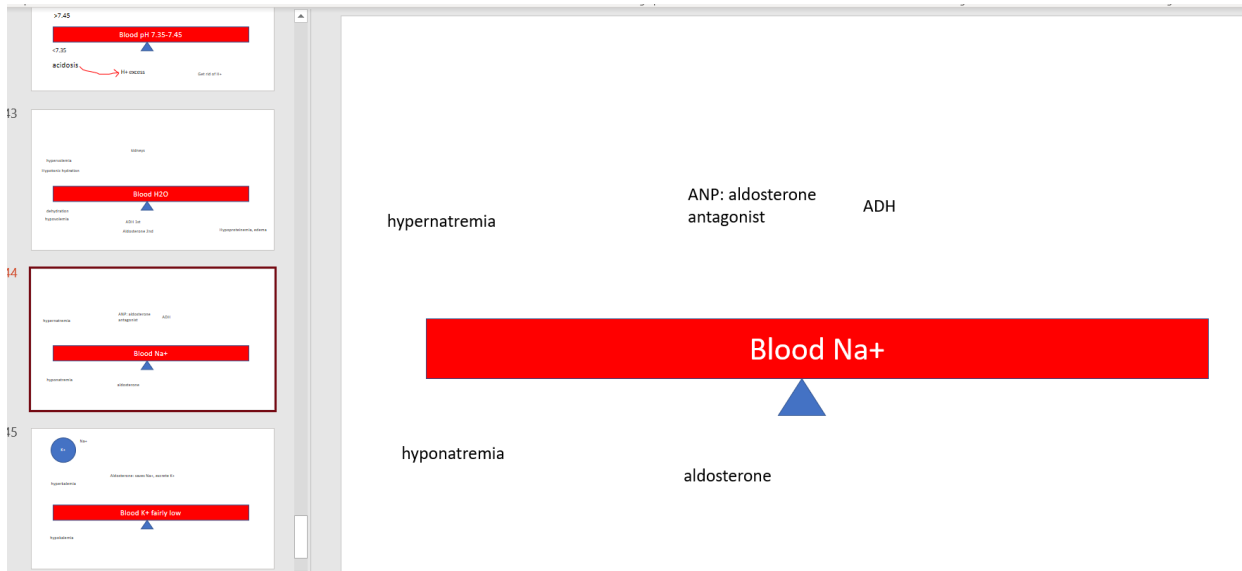
<p>B. Cardiovascular System</p> <p>C. Lymphatic and Immune System</p> <p>D. Respiratory System</p> <p>E. Digestive System</p> <p>F. Urinary System</p> <p>G. Reproductive System</p>	<p>question standardized multiple choice examination at the end of the semester. A total of 5 questions (Q3, Q5 and Q9-Q11) were used to assess SLO3.</p>	<p>The percent is based upon the average of correctly answered questions related to SLO3.</p>	<table border="1" data-bbox="953 131 1690 675"> <tr> <td></td> <td>Clanton</td> <td># students tested = 22 #correct = 89 % correct = 81%</td> </tr> <tr> <td></td> <td>Pell City</td> <td># students tested = 30 #correct =101 % correct = 67%</td> </tr> <tr> <td>Summer 2020</td> <td>Jefferson</td> <td># students tested = 43 #correct = 206 % correct = 96%</td> </tr> <tr> <td></td> <td>Shelby</td> <td># students tested = 52 #correct = 231 % correct = 89%</td> </tr> <tr> <td></td> <td>Clanton</td> <td># students tested = 15 #correct = 68 % correct = 91%</td> </tr> </table> <p>Total Students Tested = 328 Total Annual Success Rate = 85%</p>		Clanton	# students tested = 22 #correct = 89 % correct = 81%		Pell City	# students tested = 30 #correct =101 % correct = 67%	Summer 2020	Jefferson	# students tested = 43 #correct = 206 % correct = 96%		Shelby	# students tested = 52 #correct = 231 % correct = 89%		Clanton	# students tested = 15 #correct = 68 % correct = 91%	<p>success for SLO 3.</p> <p>The success rate for SLO 3 is 85% which is a slight increase in success from last year (81%).</p> <p>We will continue to teach organ system identification in lab. We will also work to provide students with materials that they can access at home. As a department we noticed a distinct trend, where students learning objective mastery increased with the transition to online learning. This could be</p>
	Clanton	# students tested = 22 #correct = 89 % correct = 81%																	
	Pell City	# students tested = 30 #correct =101 % correct = 67%																	
Summer 2020	Jefferson	# students tested = 43 #correct = 206 % correct = 96%																	
	Shelby	# students tested = 52 #correct = 231 % correct = 89%																	
	Clanton	# students tested = 15 #correct = 68 % correct = 91%																	

				due to continual access to course materials and lectures and students being able to continue their efforts to master material throughout the duration of the course.
Plan submission date:			Submitted by:	

SLO 1 and 3: Evidence and Examples of Online Access to Course Materials.



SLO2: Evidence and Example of Lecture stressing the concept of Homeostasis.



SLO 3: Evidence and Example of System Identification Exercises.

Name _____

Endocrine Review

1. Below is a table to help you review the function(s) of different hormones. Fill in the appropriate blanks, using your textbook as a reference. **If there is no answer for a particular box, write N/A.**

Hormone	Abbrev	Gland which secretes it (also include specific cells where possible)	Target cell(s)	Function	Related diseases
Adrenocorticotropic hormone					
Aldosterone					
Antidiuretic hormone					
Calcitonin					
Corticosteroids					
Estrogen					N/A
Follicle-stimulating hormone					N/A
Glucagon					
Glucocorticoids					
Growth hormone					

DIGESTIVE SYSTEM LAB

Locate these structures in pictures, the human torso, head and neck, and liver models, and the pig.

Foregut: esophagus to the duodenal papilla, supplied by celiac trunk

Midgut: distal duodenum to proximal 2/3 of transverse colon, supplied by SMA

Hindgut: distal 1/3 of transverse colon to upper anal canal, supplied by IMA

Torso model

salivary glands

- parotid
- submandibular
- sublingual

esophagus

stomach

- fundus
- body
- pylorus
- rugae
- pyloric sphincter
- esophageal sphincter

small intestine

- duodenum: duodenal papilla
- jejunum
- ileum

large intestine

- ileocecal valve
- cecum
- appendix
- ascending colon
- transverse colon
- descending colon
- sigmoid colon

Rectum

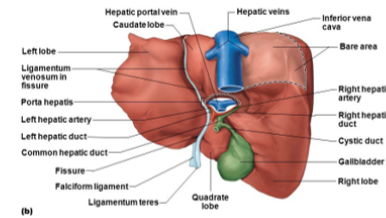
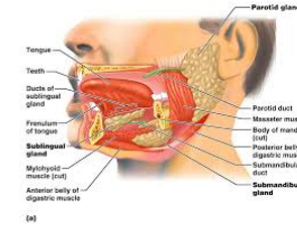
Greater omentum

pancreas

- pancreatic duct

Liver (and the liver models)

- right, left, caudate, quadrate lobes
- gall bladder
- common hepatic duct
- cystic duct
- common bile duct



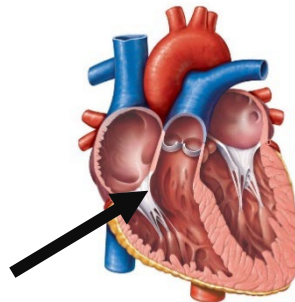
Biology 202 SLO Assessment

1. **(SLO2)** Blood calcium homeostasis is maintained by
 - A. Calcitonin and parathyroid hormone
 - B. Renin and aldosterone
 - C. Insulin and glycogen
 - D. Angiotensin I and Angiotensin II

2. **(SLO1A)** Increasing aldosterone increases
 - A. Blood Calcium concentration
 - B. Metabolism
 - C. Lactation
 - D. Blood pressure

3. **(SLO 3B)** The arrow is pointing to the

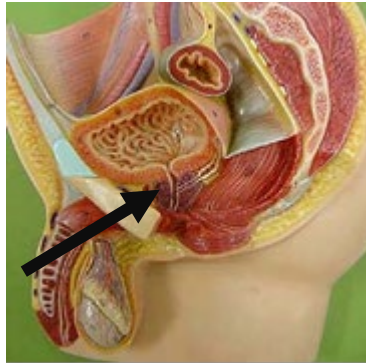
- A. Bicuspid/Mitral valve
- B. Tricuspid valve
- C. Pulmonary semilunar valve
- D. Aortic semilunar valve



4. **(SLO 1F)** Which of the following is highly reabsorbed in the kidney?
 - A. Waste
 - B. Drugs
 - C. Water
 - D. Impossible to predict without more information

5. (SLO 3G) The arrow is pointing to the

- A. Testes
- B. Prostate
- C. Urinary bladder
- D. Epididymus



6. (SLO 2) The component of blood responsible for clotting is

- A. Erythrocytes
- B. Platelets
- C. Leukocytes
- D. Hemoglobin

7. (SLO 1C) The type of cell responsible for specific immunity

- A. Neutrophil
- B. Basophil
- C. Lymphocyte
- D. Macrophage

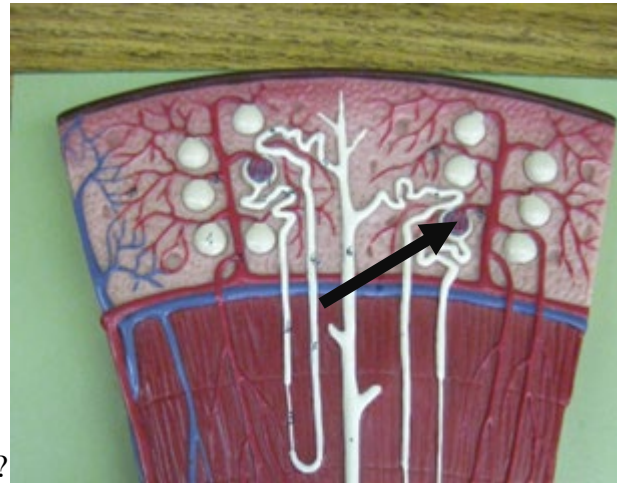
8. (SLO 1D) During inhalation, air travels from _____ atmospheric pressure to _____ intrapulmonary pressure.

- A. High; low
- B. Low; high
- C. Not enough information to determine

9. (SLO 3D) The right lung has ____ lobes
- A. 1
 - B. 2
 - C. 3
 - D. 4

10. (SLO 3F) The arrow is pointing to the

- A. Renal cortex
- B. The glomerulus
- C. The nephron loop
- D. The collecting duct



11. (SLO 3E) Which part of the digestive tract has rugae?

- A. mouth
- B. esophagus
- C. stomach
- D. small intestines
- E. large intestines

12. (SLO 1G) Gamete are produced in the

- A. Uterus and testes
- B. Ovaries and scrotum
- C. Scrotum and fallopian tubes
- D. Testes and ovaries



Assessment Record

Program: Biology (BIO 220)

Assessment period: Fall 2019- Summer 2020

Program or Department Mission:

The mission of the Biology Department is consistent with the mission of Jefferson State Community College. The department provides biology courses appropriate for students majoring in both science and non-science disciplines. Our teaching aims to help prepare students for their future professions both inside and outside of the scientific field and also to be a more informed member of their community, able to make responsible decisions in biological matters.

Course Student Outcomes & Assessment Plan

Department Level Student Learning Outcomes

1. Students will understand the principles and processes that are fundamental to life.
2. Students will understand the fundamental principles of biology at the elemental, cellular, molecular, and organism level
3. Students will receive the appropriate Biological knowledge to support a career within the Scientific, Medical, or Health and Fitness community
4. Students will understand principles of human biology that relate to health and fitness

Course Level Student Learning Outcomes Assessed

1. Students will be able to identify the differences between prokaryotic and eukaryotic cells as well as the structure and function of microorganisms in various environments.
2. Students will recognize the metabolic and genetic pathways in microorganisms as well as the clinical and industrial applications of these properties.
3. Students will be able to identify the relationship between microorganism infection and disease, interactions with the host immune system, and various methods for controlling the growth and dissemination of microorganisms.
4. Students will be able to recognize proper laboratory technique and protocols including aseptic technique, media selection, slide preparation, and microscopy.

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence			Use of Results
<p>SLO 1: Demonstrate an ability to identify the differences between prokaryotic and eukaryotic cells as well as the structure and function of microorganisms in various environments.</p>	<p>Student learning outcomes were assessed by using a 13-question standardized multiple choice examination at the end of the semester. A total of two questions (Q-1 and Q-2) were used to assess SLO-1.</p>	<p>70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions related to SLO-1.</p>	Fall 2019	Jefferson	<p>#Students Tested = 36 #Correct = 27 %Correct = 38%</p>	<p>Observations/Changes: Instructors will provide students with lectures, supplementary handouts, and study aids that they can access via the LMS. As a department we noticed that though there was a slight increase from last years' data (56% vs 58%), students tested did not meet the requirements for success for SLO-1.</p>
				Shelby	<p>#Students Tested = 73 # correct = 54 % correct = 37%</p>	
				Clanton	<p>#Students Tested= 23 # correct = 43 % correct = 93%</p>	
				Pell City	<p>#Students Tested = 14 # correct = 22 % correct = 79%</p>	
			Summer 2020	Jefferson	<p>#Students Tested = 44 # correct = 58 % correct = 66%</p>	

	See Appendix A: BIO 220 SLO Assessment		<table border="1"> <tr> <td></td> <td>Shelby</td> <td>#Students Tested = 58 # correct = 59 % correct = 51%</td> </tr> <tr> <td></td> <td>Clanton</td> <td>#Students Tested = 29 # correct = 51 % correct = 88%</td> </tr> <tr> <td></td> <td>Pell City</td> <td>#Students Tested = 17 # correct = 27 % correct = 79%</td> </tr> <tr> <td colspan="3" style="text-align: center;"> Total Students Tested = 294 Total Annual Success Rate = 58% </td> </tr> </table>				Shelby	#Students Tested = 58 # correct = 59 % correct = 51%		Clanton	#Students Tested = 29 # correct = 51 % correct = 88%		Pell City	#Students Tested = 17 # correct = 27 % correct = 79%	Total Students Tested = 294 Total Annual Success Rate = 58%			We will, therefore, continue to emphasize the differences between prokaryotic and eukaryotic cells throughout the semester, in lecture and lab as applicable.						
	Shelby	#Students Tested = 58 # correct = 59 % correct = 51%																						
	Clanton	#Students Tested = 29 # correct = 51 % correct = 88%																						
	Pell City	#Students Tested = 17 # correct = 27 % correct = 79%																						
Total Students Tested = 294 Total Annual Success Rate = 58%																								
<p>SLO 2: Recognize the metabolic and genetic pathways in microorganisms as well as the clinical and industrial applications of these properties.</p>	<p>Student learning outcomes were assessed by using a 13 question standardized multiple choice examination at the end of the semester. A total of three questions (Q3 - Q5) were used to assess SLO-2.</p> <p>See Appendix A: BIO 220 SLO Assessment</p>	<p>70% or > successful 69% or < unsuccessful</p> <p>The percent is based upon the average of correctly answered questions related to SLO-2.</p>	<table border="1"> <tr> <td>Fall 2019</td> <td>Jefferson</td> <td>#Students Tested = 36 #Correct = 60 %Correct = 56%</td> </tr> <tr> <td></td> <td>Shelby</td> <td>#Students Tested = 73 # correct = 115 % correct = 53%</td> </tr> <tr> <td></td> <td>Clanton</td> <td>#Students Tested= 23 # correct = 66 % correct = 96%</td> </tr> <tr> <td></td> <td>Pell City</td> <td>#Students Tested = 14 # correct = 38 % correct = 90%</td> </tr> <tr> <td>Summer 2020</td> <td>Jefferson</td> <td>#Students Tested = 44 # correct = 108 % correct = 82%</td> </tr> <tr> <td></td> <td>Shelby</td> <td>#Students Tested = 58 # correct = 141</td> </tr> </table>			Fall 2019	Jefferson	#Students Tested = 36 #Correct = 60 %Correct = 56%		Shelby	#Students Tested = 73 # correct = 115 % correct = 53%		Clanton	#Students Tested= 23 # correct = 66 % correct = 96%		Pell City	#Students Tested = 14 # correct = 38 % correct = 90%	Summer 2020	Jefferson	#Students Tested = 44 # correct = 108 % correct = 82%		Shelby	#Students Tested = 58 # correct = 141	<p>Observations/Changes:</p> <p>Instructors will provide students with materials they can access at home(via BlackBoard platform links). As a department we noticed that students did meet the requirements for success for SLO-2; however, the rate is a slight decrease from last year (73%).</p>
Fall 2019	Jefferson	#Students Tested = 36 #Correct = 60 %Correct = 56%																						
	Shelby	#Students Tested = 73 # correct = 115 % correct = 53%																						
	Clanton	#Students Tested= 23 # correct = 66 % correct = 96%																						
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	Shelby	#Students Tested = 58 # correct = 141																						

			<table border="1"> <tr> <td></td> <td></td> <td>% correct = 81%</td> </tr> <tr> <td></td> <td>Clanton</td> <td>#Students Tested = 29 # correct = 74 % correct = 85%</td> </tr> <tr> <td></td> <td>Pell City</td> <td>#Students Tested 17 # correct = 27 % correct = 53%</td> </tr> </table> <p>Total Students Tested = 294 Total Annual Success Rate = 71%</p>			% correct = 81%		Clanton	#Students Tested = 29 # correct = 74 % correct = 85%		Pell City	#Students Tested 17 # correct = 27 % correct = 53%	In working to illustrate how the metabolic and genetic pathways correlate to material covered in lab, this year students used virtual labs(Connect site) to strengthen their understanding of the relevance of these pathways. As there was no significant change in student success we are uncertain if these are beneficial, but anecdotally, instructors report students were better prepared for labs after completing the prelab assignments.			
		% correct = 81%														
	Clanton	#Students Tested = 29 # correct = 74 % correct = 85%														
	Pell City	#Students Tested 17 # correct = 27 % correct = 53%														
SLO 3: Identify the relationship between microorganism infection and disease, interactions with the host immune system, and various methods for controlling the growth and	Student learning outcomes were assessed by using a 13-question standardized multiple choice examination at the end of the semester. A total of two questions (Q6-	<p>70% or > successful</p> <p>69% or < unsuccessful</p> <p>The percent is based upon the average of correctly answered</p>	<table border="1"> <tr> <td>Fall 2019</td> <td>Jefferson</td> <td>#Students Tested = 36 #Correct = 58 %Correct = 81%</td> </tr> <tr> <td></td> <td>Shelby</td> <td>#Students Tested = 73 # correct = 127 % correct = 87%</td> </tr> <tr> <td></td> <td>Clanton</td> <td>#Students Tested= 23 # correct = 46 % correct = 100%</td> </tr> <tr> <td></td> <td>Pell City</td> <td>#Students Tested = 14</td> </tr> </table>	Fall 2019	Jefferson	#Students Tested = 36 #Correct = 58 %Correct = 81%		Shelby	#Students Tested = 73 # correct = 127 % correct = 87%		Clanton	#Students Tested= 23 # correct = 46 % correct = 100%		Pell City	#Students Tested = 14	Observations/Changes: Instructors will provide students with materials they can access at home(via BlackBoard platform links). As a department we noticed that students tested did meet the requirements for success for SLO-3; however, the rate is a slight decrease when
Fall 2019	Jefferson	#Students Tested = 36 #Correct = 58 %Correct = 81%														
	Shelby	#Students Tested = 73 # correct = 127 % correct = 87%														
	Clanton	#Students Tested= 23 # correct = 46 % correct = 100%														
	Pell City	#Students Tested = 14														

dissemination of microorganisms.	Q7) were used to assess SLO-3. See Appendix A: BIO 220 SLO Assessment	questions related to SLO-3.	<table border="1"> <tr> <td></td> <td></td> <td># correct = 24 % correct = 86%</td> </tr> <tr> <td>Summer 2020</td> <td>Jefferson</td> <td>#Students Tested = 44 # correct = 82 % correct = 93%</td> </tr> <tr> <td></td> <td>Shelby</td> <td>#Students Tested = 58 # correct = 104 % correct = 90%</td> </tr> <tr> <td></td> <td>Clanton</td> <td>#Students Tested = 29 # correct = 53 % correct = 91%</td> </tr> <tr> <td></td> <td>Pell City</td> <td>#Students Tested = 17 # correct = 30 % correct = 88%</td> </tr> <tr> <td colspan="3" style="text-align: center;">Total Students Tested = 294 Total Annual Success Rate = 89%</td> </tr> </table>					# correct = 24 % correct = 86%	Summer 2020	Jefferson	#Students Tested = 44 # correct = 82 % correct = 93%		Shelby	#Students Tested = 58 # correct = 104 % correct = 90%		Clanton	#Students Tested = 29 # correct = 53 % correct = 91%		Pell City	#Students Tested = 17 # correct = 30 % correct = 88%	Total Students Tested = 294 Total Annual Success Rate = 89%			compared with data from last year (91%). Instructors continue to emphasize content related to infectious diseases during lecture and lab and by providing supplement resources students could access at home. (See evidence SLO 3)
		# correct = 24 % correct = 86%																						
Summer 2020	Jefferson	#Students Tested = 44 # correct = 82 % correct = 93%																						
	Shelby	#Students Tested = 58 # correct = 104 % correct = 90%																						
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	Pell City	#Students Tested = 17 # correct = 30 % correct = 88%																						
Total Students Tested = 294 Total Annual Success Rate = 89%																								
SLO 4: Recognize proper laboratory technique and protocols including aseptic technique, media selection, slide preparation, and microscopy.	Student learning outcomes were assessed by using a 13-question standardized multiple choice examination at the end of the semester. A total of 6 questions (Q8 - Q13) were used to assess SLO-4	70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered	<table border="1"> <tr> <td>Fall 2019</td> <td>Jefferson</td> <td>#Students Tested = 36 #Correct = 149 %Correct = 69%</td> </tr> <tr> <td></td> <td>Shelby</td> <td>#Students Tested = 73 # correct = 359 % correct = 82%</td> </tr> <tr> <td></td> <td>Clanton</td> <td>#Students Tested= 23 # correct = 135 % correct = 98%</td> </tr> <tr> <td></td> <td>Pell City</td> <td>#Students Tested = 14 # correct = 72</td> </tr> </table>			Fall 2019	Jefferson	#Students Tested = 36 #Correct = 149 %Correct = 69%		Shelby	#Students Tested = 73 # correct = 359 % correct = 82%		Clanton	#Students Tested= 23 # correct = 135 % correct = 98%		Pell City	#Students Tested = 14 # correct = 72	Observations/Changes: Instructors will provide students with materials they can access at home(via BlackBoard platform links). As a department we noticed students tested met the requirements for success for SLO-4; the rate for is consistent with last years rate of success (82%).						
Fall 2019	Jefferson	#Students Tested = 36 #Correct = 149 %Correct = 69%																						
	Shelby	#Students Tested = 73 # correct = 359 % correct = 82%																						
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	<p>See Appendix A: BIO 220 SLO Assessment</p>	<p>questions related to SLO-4</p>	<table border="1"> <tr> <td></td> <td></td> <td>% correct = 86%</td> </tr> <tr> <td>Summer 2020</td> <td>Jefferson</td> <td>#Students Tested = 44 # correct = 218 % correct = 83%</td> </tr> <tr> <td></td> <td>Shelby</td> <td>#Students Tested = 58 # correct = 250 % correct = 72%</td> </tr> <tr> <td></td> <td>Clanton</td> <td>#Students Tested = 29 # correct = 159 % correct = 91%</td> </tr> <tr> <td></td> <td>Pell City</td> <td>#Students Tested = 17 # correct = 86 % correct = 84%</td> </tr> </table> <p>Total Students Tested = 294 Total Annual Success Rate = 81% Fall 2019</p>			% correct = 86%	Summer 2020	Jefferson	#Students Tested = 44 # correct = 218 % correct = 83%		Shelby	#Students Tested = 58 # correct = 250 % correct = 72%		Clanton	#Students Tested = 29 # correct = 159 % correct = 91%		Pell City	#Students Tested = 17 # correct = 86 % correct = 84%	<p>Instructors will continue to emphasize the proper laboratory techniques and protocols throughout the semester. Just a note, because of COVID, we transitioned all lab content to at home or online and despite this dramatic change we have managed to keep our success stable. Across the campuses, instructors have successfully made use of virtual labs and at home lab kits to ensure a laboratory component. (See evidence SLO 4) This data suggests we can meet our learning objectives with these approaches.</p>
		% correct = 86%																	
Summer 2020	Jefferson	#Students Tested = 44 # correct = 218 % correct = 83%																	
	Shelby	#Students Tested = 58 # correct = 250 % correct = 72%																	
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<p>Plan submission date: 2019-2020 Year</p>			<p>Submitted by: Stephanie Miller</p>																

Appendix A: BIO 220 SLO assessment

SLO 1

1. One of the main differences between Prokaryotic and Eukaryotic cells is _____
 - a. Cell Membrane
 - b. Membrane bound organelles
 - c. Flagella
 - d. Cell Wall
 - e. All of the above

2. The organelle responsible for cell motility?
 - a. Cilia
 - b. Fimbriae
 - c. Flagellum
 - d. Pili
 - e. All of the above

SLO 2

3. Which pathway is NOT involved in aerobic respiration?
 - a. Krebs Cycle
 - b. Glycolysis
 - c. TCA cycle
 - d. Electron Transport

4. The process of going from DNA to RNA is called _____?
 - a. Transcription
 - b. Translation
 - c. Replication
 - d. All of the above
 - e. None of the above

5. _____ is used for storing hereditary information, _____ is used for directly making protein.
- RNA, RNA
 - RNA, DNA
 - DNA, DNA
 - DNA, RNA
 - DNA, protein

SLO 3

6. What are microbes that cause diseases in all humans called?
- Normal Flora
 - Transient Flora
 - Pathogens
 - Opportunistic Pathogens
 - None of the above
7. The destruction of all microbial growth, including endospores, is called _____.
- Sanitation
 - Disinfection
 - Sterilization
 - All of the above
 - None of the above

SLO 4

8. When inoculating an agar slant from a broth, what should be used?
- Inoculating Loop
 - Inoculating Needle
 - Inoculating Spatula
 - Inoculating Dropper
 - None of the above
9. When inoculating a new growth media from a pure bacterial culture, the biggest concern is _____?
- Not transferring enough bacteria
 - Transferring too much bacteria
 - Contamination
 - All of the above

10. Please select the correct order for the Gram Stain technique.
 - a. Crystal Violet, Alcohol, Iodine, Safranin
 - b. Crystal Violet, Iodine, Alcohol, Safranin
 - c. Safranin, Iodine, Crystal Violet, Alcohol
 - d. Safranin, Iodine, Alcohol, Crystal Violet
 - e. Iodine, Crystal Violet, Safranin, Alcohol
11. After performing a Gram Stain, what color and shape would Gram positive cocci bacteria be?
 - a. Pink circles
 - b. Purple circles
 - c. Pink rods
 - d. Purple rods
12. If you wanted to isolate a single colony of bacteria from a liquid broth culture, what technique would you use?
 - a. Streak plate
 - b. Filtration
 - c. Slant
 - d. Broth
13. What type of growth media will allow all microbes to grow, but will also allow for the ability to see differences between microbes.
 - a. General Growth Media (Nutrient Agar)
 - b. Selective Media
 - c. Differential Media
 - d. Selective and Differential Media

Evidence SLO 1

Handouts provided to students as a quick reference for Prokaryotic vs Eukaryotic

Prokaryotic Organelles

Website: <http://www.youtube.com/watch?v=fzIKJpcfXfo>

1. **Glycocalyx**— Sugar and peptides on surface of cell. In some eukaryotic cells.
2. **Flagella (flagellum)**—whip-like structure that allow motility. Attached through the cell wall to the plasma membrane. 4 arrangements of flagella:

Monotrichous—one flagellum at one pole

Amphitrichous—several flagella at each poles

Lophotrichous—several flagella at one pole

Peritrichous—flagella all over the cell

On some eukaryotic cells.

3. **Fimbriae**—small extensions off cell wall, hair-like. Fimbriae are used for adherence. Can be all over cell or only on poles. .
Fimbriae not present in eukaryotes.
4. **Cell wall**—already discussed. Present in some eukaryotes.
5. **Plasma membrane**—already discussed. Present in all eukaryotes.
6. **Cytoplasm**—thick liquid portion inside cell. Compose mainly of water, and proteins, carbohydrates, lipids, ions, small molecules. Supports organelles. Present in all eukaryotes.
7. **Nucleoid region**—contains genetic material (DNA) of cell. Not surrounded by a membrane.
Not present in eukaryotes.
8. **Plasmids**—small circular pieces of DNA. Found in cytoplasm. Contain several genes, not necessary for survival, but may contain antibiotic resistance genes. Replicates separately from the DNA. Used in genetic recombination. Found in some fungi and protozoa.
9. **Ribosomes**—functions in protein synthesis. Composed of 2 subunits made of ribosomal proteins and rRNA. Target of some antibiotics. Present in all eukaryotes, but with several differences.

*10. **Endospores**—only in the genera *Bacillus* and *Clostridium*. During times of environmental stress, cell dehydrates and wall thickens. Forms a strong, durable spore, resistant to heat, dessication, exposure to toxins and radiation. Only destroyed with **autoclaving** (high heat with pressure) or **gamma radiation**. When exposed to favorable conditions again, the endospore will germinate back to its vegetative state.

Not present in eukaryotes.

11. **Cytoskeleton**—long strands of actin that surround the inside of the plasma membrane and give shape and support to the cell. Present in eukaryotic cells.

12. **Granule**—an inclusion body that may contain fat, glycogen or phosphate which will be used as food when needed. Found in eukaryotic cells.

13. **Pilus**-- Pilli are longer than fimbriae and are used for DNA exchange (sex pillus) and for attachment to mucosal cells. Present in some eukaryotic cells.

Eukaryotic Organelles

1. Flagella – Whip like structure that allows motility. Multi-protein complex with a microtubule core. Requires ATP

2. Cilia – Shorter than flagella and more numerous. Utilize a power stroke/recovery stroke mechanism

3. Glycocalyx – polysaccharide coating. Can be loose (slime layer) or highly organized (capsule). Functions include protection, adhesion, and reception of signals

4. Cell wall – Rigid, provides support and shape to the cell. Found in Fungi and algae. Chemically distinct from prokaryotic cell walls

5. Plasma membrane – phospholipid bilayer with proteins embedded. Lipid inside (hydrophobic) and phosphate heads external (hydrophilic). SEMIPERMEABLE!

6. Nucleus - Genetic control center of the cell. Contains the DNA (organized in chromosomes). Has a 2 layer nuclear envelope held together by nuclear pores.

7. Smooth Endoplasmic Reticulum – responsible for lipid metabolism and detoxification

8. Rough Endoplasmic Reticulum – dotted with ribosomes, is the site of protein synthesis

9. Ribosomes – Functions in protein synthesis. Composed of two subunits (40S and 60S) made up of ribosomal RNA and protein. Larger than prokaryotic ribosomes

10. Mitochondria – The power house of the cell. Responsible for cellular respiration. Contains its own DNA and ribosomes (which are similar to prokaryotic DNA and ribosomes)

11. Golgi Body – Site of protein processing. Proteins are modified (spliced, glycosylated, etc) and then packaged for transport to the cytoplasm, cell membrane or exocytosis

12. Chloroplast – site of photosynthesis. Like the mitochondria it has its own DNA and ribosomes that are similar to prokaryotes.

13. Cytoskeleton – Intracellular matrix that plays a role in cell shape and support. Consists of actin, microfilaments, intermediate filaments, and microtubules

14. Vacuoles – Lipid enclosed space for storage of water, food, enzymes and waste.

SLO 2 Evidence:

Example of the Connect Pre-lab assignment

ASEPTIC TECHNIQUE • BROTH CULTURE TO STERILE AGAR PLATE

INTRODUCTION LABORATORY SIMULATION

Key Concepts

Aseptic technique is working with microorganisms with the goal of preventing contamination of yourself and the microbial cultures you are using.

Contaminating organisms may come from the environment, your hands or tools used during the process.

Pure cultures are those that only contain one type of microorganism, and are necessary when trying to identify a particular microorganism.

Culture media contains specific compositions to help grow microbes in a controlled manner because microbes need the right kind of nutrients to grow and reproduce.

Microbial cultures are transferred from one medium to another by inoculating loops or needles.

Inoculating loops are used to transfer inoculum between tubes of broth or onto the surface of an agar slant or plate.

A broth is a liquid nutrient medium used to support the growth of microbes with the advantage of supporting rapid and large bacterial population growth.

A broth is limited in that one cannot see individual cells or colonies so pure cultures cannot be verified in this medium.

An agar plate is a petri dish with a solidified culture medium which provides a large surface area for microbial growth.

Agar plates allow for isolation of individual bacteria to form colonies.

Specialized media allow for observation of colony morphology as well as indicators that aid in bacterial identification.

Overview


Knowing the different ways in which culture media is handled helps to produce cultures without contaminating them with unwanted microbes.


In this simulation, you will transfer bacteria using aseptic technique from a broth culture to a sterile agar plate and then observe growth after incubation.

Good laboratory practice involves wiping down the workspace with disinfectant at the beginning and end of the exercise and washing hands at the end of the laboratory exercise before leaving. This simulation assumes that has been done and will not be shown.

Before you begin


Inoculating tools must be sterilized both before and after transfer by heating to red hot in the flame of a Bunsen burner or in a microincinerator.


Bunsen burner


Microincinerator

The inoculating tool must be allowed to cool before picking up cells to be transferred or else they will be destroyed in the process.

The mouth of a glass culture tube should be passed through the flame of a bunsen burner when the cap is first removed and again before it is replaced.



CONTINUE TO
Laboratory Simulation

SLO 3 Evidence:

Students take weekly bug quizzes where they are required to identify the organism that causes a particular disease

Example bug quiz schedule

	B	D	F	H
1	BIO 220 Spring 2020 M/W Bug Quizzes		<i>Each quiz is worth 10 points. Spelling of the bug counts.</i>	
2	Bug Quiz #1--Wednesday 1/15		Bug Quiz #6--Wednesday 3/4	
3	<i>Staphylococcus aureus</i>	Endocarditis	<i>Streptococcus pyogenes</i>	Laryngitis
4	<i>E. coli</i>	Food poisoning	<i>Streptococcus pneumoniae</i>	Sinusitis
5	<i>Pseudomonas</i>	Burn infections	<i>Pseudomonas</i>	Pneumonia
6	<i>Streptococcus pyogenes</i>	Strep throat	Influenza virus	Influenza
7	<i>Haemophilus influenzae</i>	Pneumonia	Respiratory syncytial virus	Viral pneumonia
9	Bug Quiz #2--Wednesday 1/29		Bug Quiz #7--Wednesday 3/11	
10	<i>Streptococcus pneumoniae</i>	Pneumonia	<i>Neisseria gonorrhoea</i>	Gonorrhea
11	<i>Bordetella pertussis</i>	Pertussis (whooping cough)	<i>Chlamydia trachomatis</i>	Chlamydia
12	Varicella-zoster herpes virus	Chicken pox	<i>Treponema pallidum</i>	Syphilis
13	<i>Staphylococcus aureus</i>	Toxic shock syndrome	Herpes simplex virus	Genital herpes
14	<i>Clostridium tetani</i>	Tetanus	Human papillomavirus	HPV infection, cervical/oral/ throat cancer
16	Bug Quiz #3--Wednesday 2/6		Bug Quiz #8--Wednesday 3/18	
17	<i>Clostridium botulinum</i>	Botulism	<i>Clostridium difficile</i>	Diarrhea
18	<i>Candida albicans</i>	Yeast infection, thrush	<i>Brucella abortus</i>	Brucellosis
19	<i>Neisseria meningitidis</i>	Meningococcal meningitis	<i>Francisella tularensis</i>	Tularemia (rabbit fever)
20	<i>Streptococcus pneumoniae</i>	Pneumococcal meningitis	<i>Campylobacter jejuni</i>	Food poisoning
21	<i>Mycobacterium tuberculosis</i>	Tuberculosis	<i>Bartonella henselae</i>	Cat scratch fever
23	Bug Quiz #4--Wednesday 2/12		Bug Quiz #9--Wednesday 4/1	
24	<i>Corynebacterium diphtheriae</i>	Diphtheria	<i>Streptococcus pyogenes</i>	Scarlet fever
25	Arbovirus	West Nile viral encephalitis	<i>Helicobacter pylori</i>	Stomach ulcers
26	<i>Haemophilus influenzae</i>	Meningitis	Ebstein-Barr virus	Infectious mononucleosis
27	<i>Borrelia burgdorferi</i>	Lyme disease	<i>Listeria monocytogenes</i>	Food poisoning
28	<i>Vibrio cholerae</i>	Cholera	<i>Rickettsia rickettsii</i>	Rocky mountain spotted fever
30	Bug Quiz #5--Wednesday 2/26			
31	<i>Streptococcus pyogenes</i>	Rheumatic fever		
32	<i>Clostridium perfringens</i>	Gangrene		
33	<i>Haemophilus influenzae</i>	Sinusitis		
34	<i>Staphylococcus aureus</i>	Middle ear infection		

Each weekly bug quiz has a corresponding power point presentation to provide context for the weeks organisms and diseases

The screenshot shows a Microsoft PowerPoint presentation titled "Bug Quiz 1 slides (4)". The presentation is displayed in a window with the name "Erin Arnold". The ribbon includes tabs for File, Home, Insert, Draw, Design, Transitions, Animations, Slide Show, Record, Review, View, and Help. The Home tab is active, showing options for Clipboard, Slides, Font, Paragraph, Drawing, Editing, and Designer. The presentation content consists of five slides, each with a micrograph, a clinical image, and a brief description:

- Slide 1:** *Staphylococcus aureus* Endocarditis. Micrograph shows Gram-positive cocci in clusters. Clinical image shows a heart with endocarditis. Description: Endocarditis is an infection of the endocardium, which is the inner lining of the heart chambers and heart valves.
- Slide 2:** *E. coli* Food poisoning. Micrograph shows Gram-negative rods. Clinical image shows a person with food poisoning. Description: *E. coli* food poisoning can cause diarrhea and nausea. *E. coli* O157 can cause HUS and hemorrhagic colitis.
- Slide 3:** *Pseudomonas aeruginosa* Burn infections. Micrograph shows Gram-negative rods. Clinical image shows a burn infection. Description: *Pseudomonas* will cause yellow-greenish pus and borlines on burns.
- Slide 4:** *Streptococcus pyogenes* Strep throat. Micrograph shows Gram-positive cocci in chains. Clinical image shows a person with strep throat. Description: *Streptococcus pyogenes* causes strep throat. Key characteristics are pus pockets on the tonsils. "pyo" means pus, "genus" means to cause or create.
- Slide 5:** *Haemophilus influenzae* Pneumonia. Micrograph shows Gram-negative rods with capsules. Clinical image shows a person with pneumonia. Description: *Haemophilus influenzae* with capsules cause serious cases of pneumonia.

The status bar at the bottom indicates "Slide 1 of 5", "Accessibility: Investigate", and system information: "54°F Cloudy", "10:21 AM 12/13/2022".

SLO 4 Evidence

Example of lab offerings during the transition to 100% online coursework during COVID. This instructor used a combination of virtual labs and at home lab experiments students completed after picking up a kit.

The screenshot shows a web browser window with several tabs open, including "myJSCC Portal Information - Jeffe...", "myJSCC Portal - Home", "Content", and "Mail - Erin Arnold - Outlook". The address bar shows the URL "jeffersonstate.blackboard.com/ultra/courses/_20082_1/cl/outline".

The main content area is titled "General Microbiology Lab" and features a sidebar menu on the left. The sidebar menu includes sections for "General Microbiology" (Home Page, Syllabus, Welcome Video, Syllabus Quiz/Attendance Verification, Microbiology Text Book, Lecture, Lab, Scientific Literacy Project, Exams, Course Grades, Discussions, Groups, Tools, Help) and "Course Management" (Control Panel, Content Collection, Course Tools, Evaluation, Grade Center, Users and Groups, Customization, Packages and Utilities, Help).

The main content area is titled "Lab" and contains four items, each with a folder icon and a title:

- Virtual Labs**: Complete the following labs and submit to Dr. Arnold at earnold1@jeffersonstate.edu
- Aseptic Technique**: Watch this video to learn about aseptic technique in the microbiology lab and then take the quiz
- Gram Stain**: Watch the video on the gram stain and then take the quiz
- At Home Labs**: Find instructional videos and handouts for the at home lab kits

The bottom of the screenshot shows a Windows taskbar with a search bar, several application icons, and a system tray displaying the date and time as "10:26 AM 12/13/2022" and the weather as "54°F Cloudy".