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
1. Recognize how the scientific method is utilized to explore biological processes	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. 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 1.	Fall 2019	Jefferson	# students tested = 75 # correct = 146 % correct = 65%	**Observations/Changes Based on Current Cycle (19/20)** One of the largest changes this year was brought about the COIVD 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.
				Shelby	# students tested = 127 # correct = 307 % correct =81%	
				Pell City	# students tested = 25 # correct = 65 % correct = 87%	
			Summer 2020	Jefferson	# students tested = 41 # correct = 105 % correct = 85%	
				Shelby	# students tested = 29 # correct = 69	

					% 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%	**Observations/Changes Based on Current Cycle (19/20)** 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	

<table>
<tr>
<td>and organismal levels</td>
<td>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</td>
<td>average of correctly answered questions related to SLO 2.</td>
<td>
<table>
<tr><td></td><td></td><td># correct = 160
% correct = 91%</td></tr>
<tr><td>Summer 2020</td><td>Jefferson</td><td># students tested = 41
correct =258
% correct = 90%</td></tr>
<tr><td></td><td>Shelby</td><td># students tested = 29
correct = 176
% correct = 87%</td></tr>
<tr><td></td><td>Pell City</td><td># students tested = 19
correct = 118
% correct = 89%</td></tr>
<tr><td></td><td>Clanton</td><td># students tested = 25
correct = 140
% correct = 80%</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Total Students Tested = 341

Total Annual Success Rate: 78%
</td>
<td>studies) that demonstrate the relevance of these topics.</td>
</tr>
</table>

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%	**Observations/Changes Based on Current Cycle (19/20)** 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	

					# correct = 104 % correct = 83%	
			Total Students Tested = 341 ***Total Annual Success Rate: 64%***			
Plan submission date: September 23, 2022			**Submitted by:** Crystal Wheeler			

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 form 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

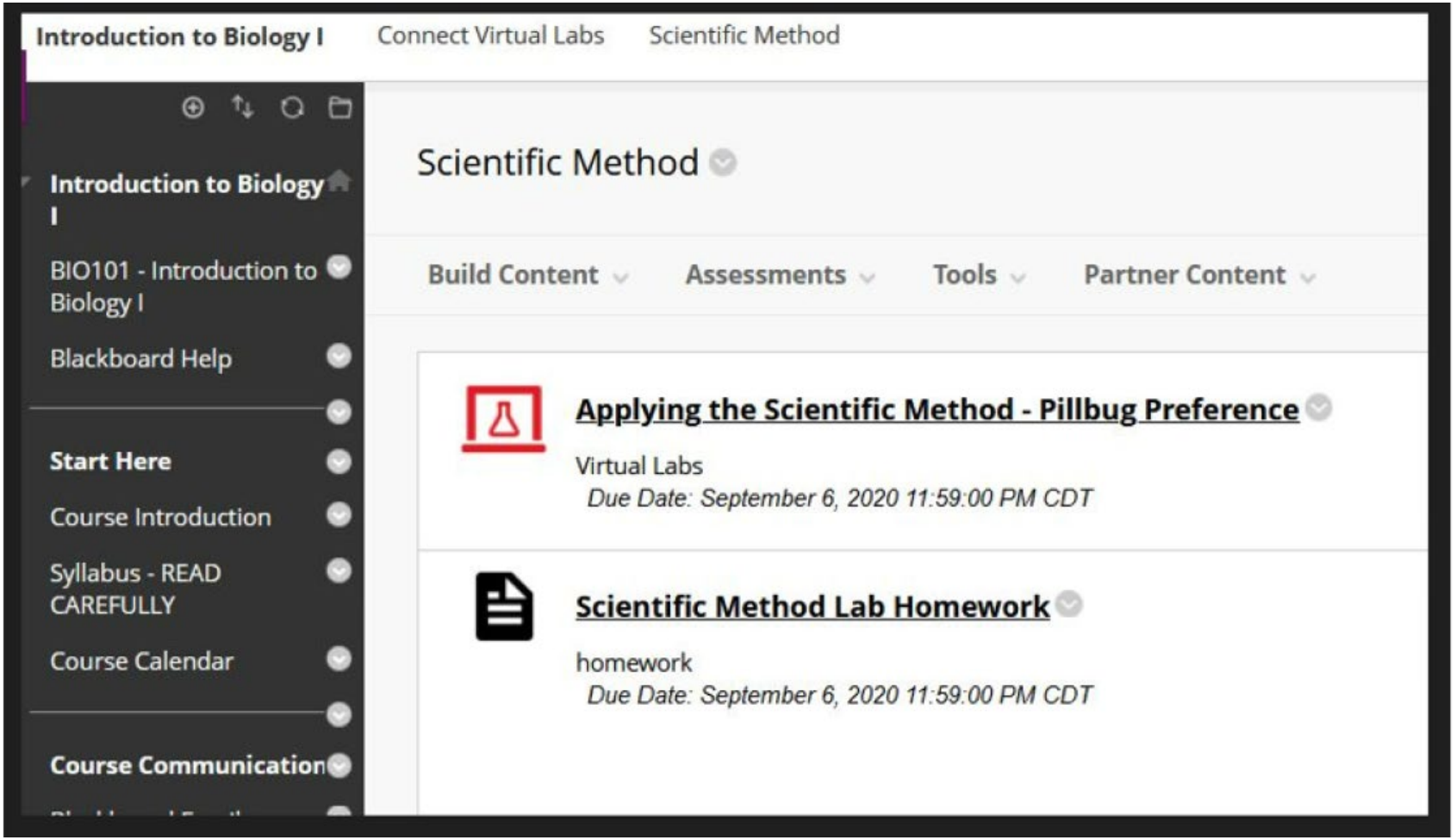
SLO 3

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

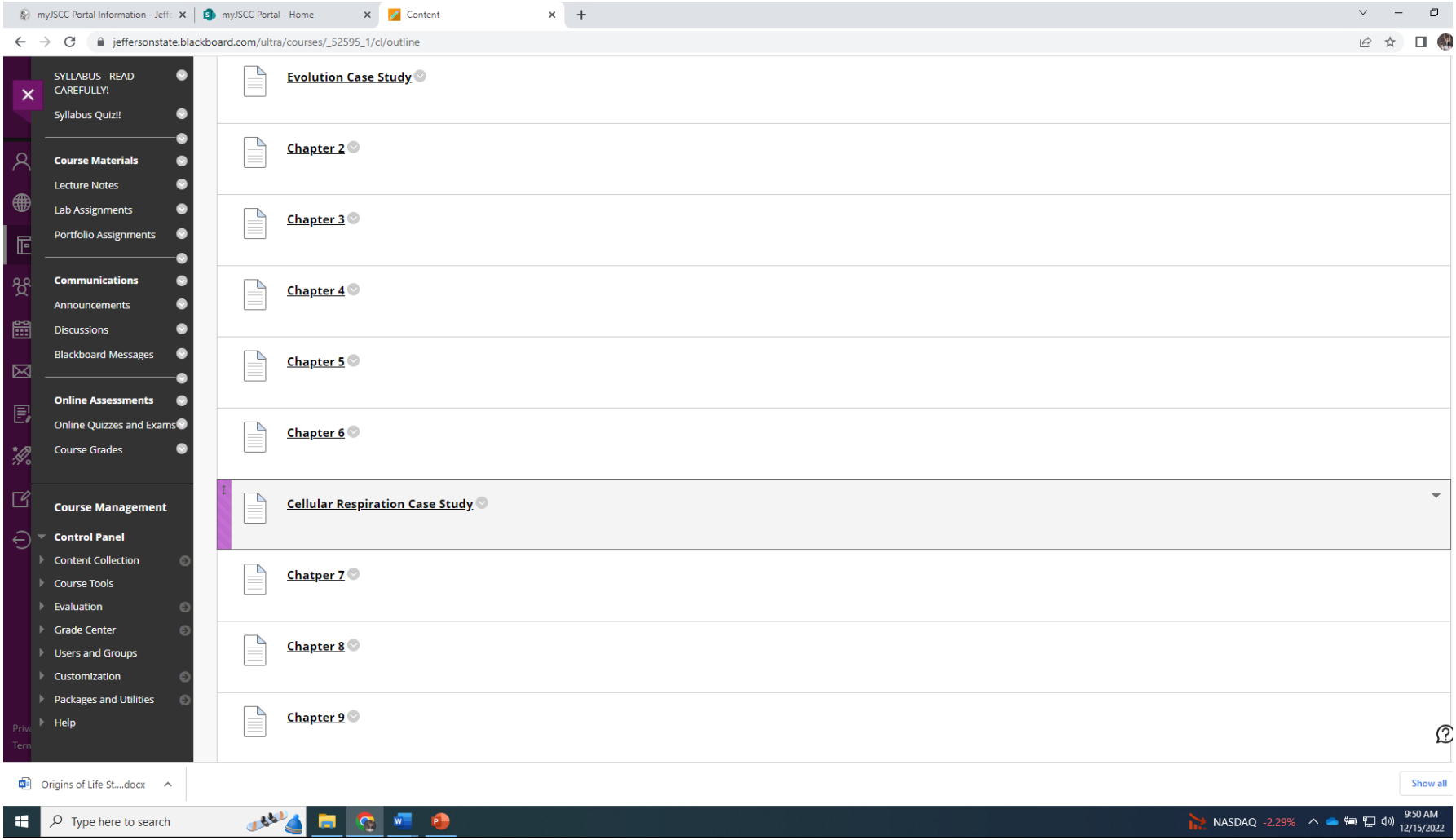
15. During respiration, the diaphragm contracts to increase the volume of the thoracic (chest) cavity. This allows the pressure to drop and leads to _____

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



Evidence for SLO 2 Example of a cellular respiration case study



Evidence for SLO 3 Example of virtual fetal pig dissections utilized

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 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 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.

<table>
<tr><th>Intended Outcomes</th><th>Means of Assessment</th><th>Criteria for Success</th><th colspan="3">Summary & Analysis of Assessment Evidence</th><th>Use of Results</th></tr>
<tr>
<td>SLO1: Demonstrate knowledge of evolution in both plant of animal life.</td>
<td>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.

See appendix A: BIO 102 SLO Assessment</td>
<td>70% or > successful

69% or < unsuccessful

The percent is based upon the average of correctly answered questions related to SLO 1.</td>
<td colspan="3">
<table>
<tr><td>Fall 2019</td><td>Shelby</td><td># students tested = 29
correct = 94
% correct = 48%</td></tr>
<tr><td></td><td>Pell City</td><td># students tested = 25
correct = 134
% correct = 77%</td></tr>
<tr><td>Summer 2020</td><td>Shelby</td><td># students tested = 27
correct = 161
% correct = 85%</td></tr>
<tr><td></td><td>Pell City</td><td># students tested = 29
correct = 167
% correct = 82%</td></tr>
</table>
Total Students Tested = 109

Total Annual Success Rate: 73%
</td>
<td><u>Observations/Changes Based on Current Cycle (19/20)</u>

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.</td>
</tr>
</table>

<table>
<tr>
<td>SLO 2: Identify general characteristics, anatomy, and taxonomy of plant and animals.</td>
<td>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.

See appendix A: BIO 102 SLO Assessment</td>
<td>70% or > successful

69% or < unsuccessful

The percent is based upon the average of correctly answered questions related to SLO 2.</td>
<td>
<table>
<tr><td>Fall 2019</td><td>Shelby</td><td># students tested = 28

correct = 232

% correct = 59%</td></tr>
<tr><td></td><td>Pell City</td><td># students tested = 25

correct = 294

% correct = 84%</td></tr>
<tr><td></td><td>Shelby</td><td># students tested = 27

correct = 304

% correct = 80%</td></tr>
<tr><td>Summer 2020</td><td>Pell City</td><td># students tested = 29

correct = 342

% correct = 84%</td></tr>
</table>

Total Students Tested = 109

Total Annual Success Rate: 77%
</td>
<td><u>Observations/Changes Based on Current Cycle (19/20)</u>

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.</td>
</tr>
<tr>
<td>SLO3: Explain the interrelationships between the varied life forms on earth</td>
<td>Student learning outcomes were assessed by using 25</td>
<td>70% or > successful</td>
<td>
<table>
<tr><td>Fall 2019</td><td>Shelby</td><td># students tested = 28

correct = 72</td></tr>
</table>
</td>
<td><u>Observations/Changes Based on Current Cycle (19/20)</u></td>
</tr>
</table>

<table>
<tr>
<td>and identify the role of humans within ecological systems.</td>
<td>question standardized multiple choice examination at the end of the semester. A total of 4 questions (Q22-Q25) were used to assess SLO 3.

See appendix A: BIO 102 SLO Assessment</td>
<td>69% or < unsuccessful

The percent is based upon the average of correctly answered questions related to SLO 3.</td>
<td>
<table>
<tr><td></td><td></td><td>% correct = 64%</td></tr>
<tr><td></td><td>Pell City</td><td># students tested = 25

correct = 87

% correct = 87%</td></tr>
<tr><td>Summer 2020</td><td>Shelby</td><td># students tested = 27

correct = 94

% correct = 87%</td></tr>
<tr><td></td><td>Pell City</td><td># students tested = 29

correct = 101

% correct = 87%</td></tr>
</table>

Total Students Tested = 109

Total Annual Success Rate: 81%
</td>
<td>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.</td>
</tr>
<tr>
<td colspan="3">Plan submission date: Plan submission date:</td>
<td colspan="2">Submitted by:</td>
</tr>
</table>

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

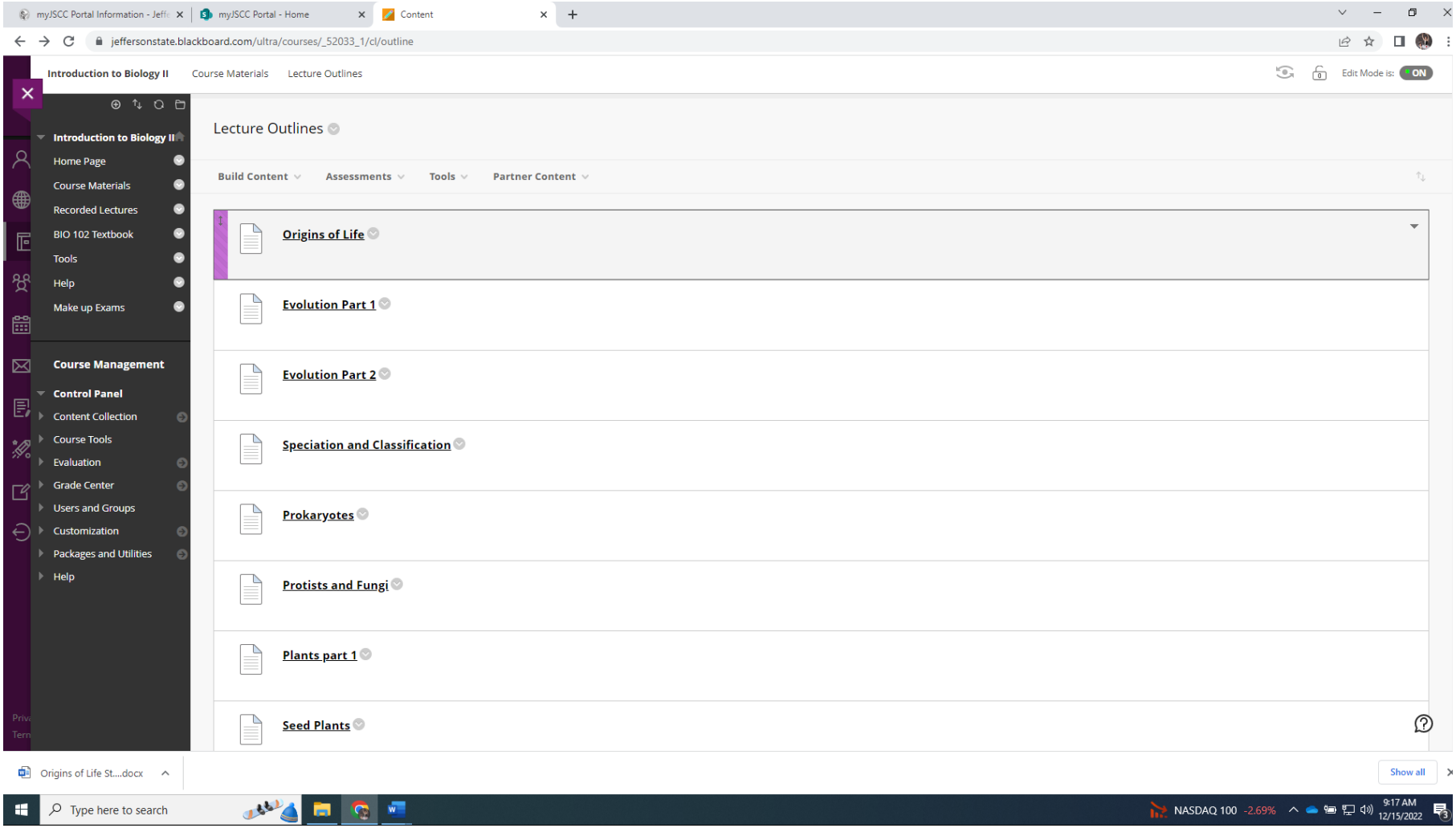
22. If you were studying a species which has totally disappeared from the planet you would be studying:
A. An endangered species
B. An introduced species
C. An extinct species
D. A threatened species
E. A keystone species

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

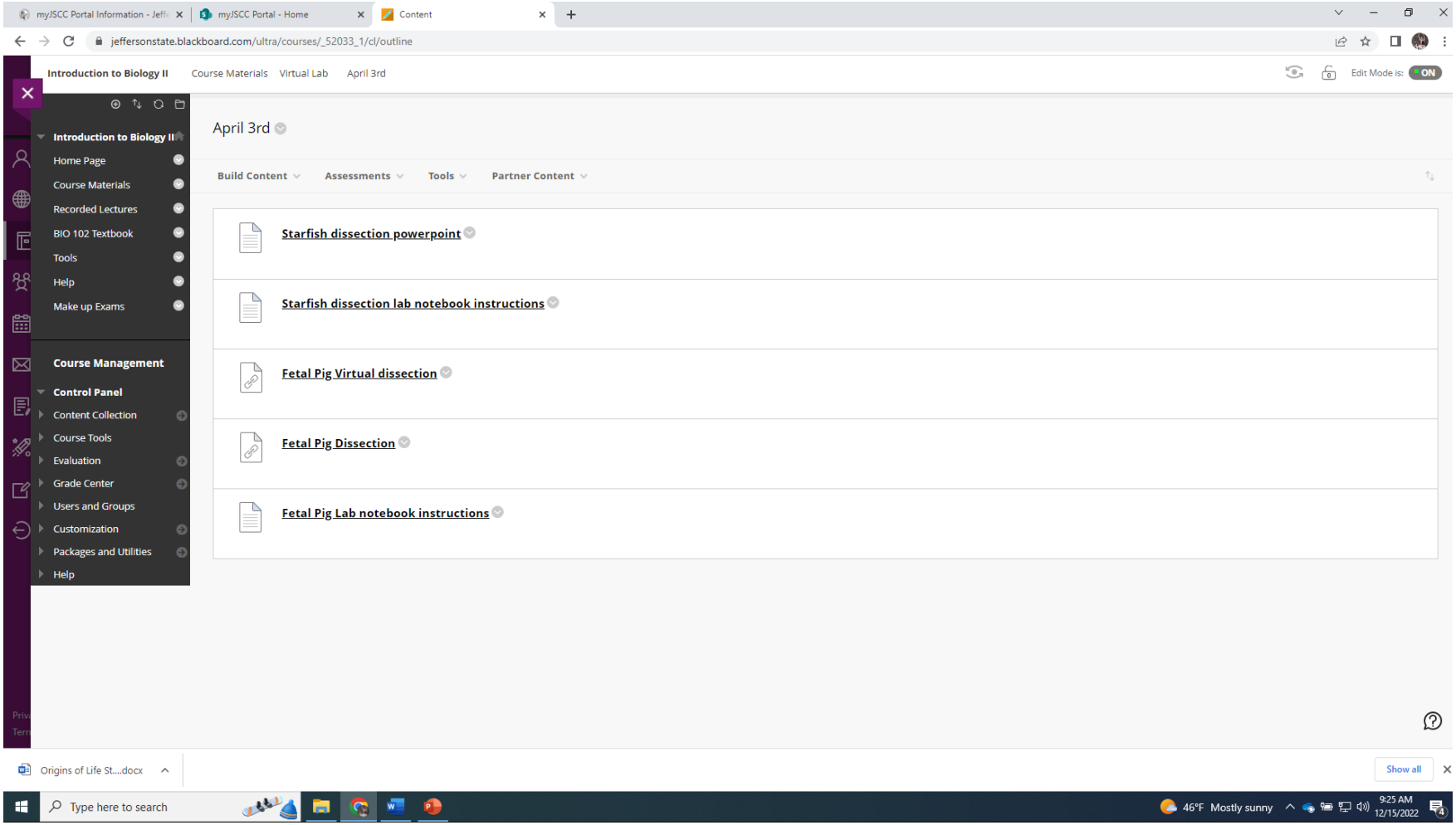
24. Species that influence the viability of a community, although their numbers may not be exceedingly high, are referred to as:
A. Pioneer species
B. Alien species
C. Introduced species
D. Nonnative species
E. Keystone species

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



Evidence for SLO 2: Examples of virtual lab dissection materials



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 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 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.

<table>
<tr><th>Intended Outcomes</th><th>Means of Assessment</th><th>Criteria for Success</th><th>Summary & Analysis of Assessment Evidence</th><th>Use of Results</th></tr>
<tr>
<td>1. Demonstrate knowledge of the fundamental concepts and processes in biology including the scientific method, evolution, biological macromolecules and biochemistry</td>
<td>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

See Appendix A for SLO assessment questions</td>
<td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO1</td>
<td>
<table>
<tr><td>Fall 2019</td><td>Jefferson</td><td># students tested = 34
correct = 100
% correct = 74%</td></tr>
<tr><td></td><td>Shelby</td><td># students tested = 59
correct = 173
% correct = 73%</td></tr>
<tr><td></td><td>Clanton</td><td># students tested = 16
correct = 60
% correct = 94%</td></tr>
<tr><td></td><td>Pell City</td><td># students tested = 26
correct = 80
% correct = 77%</td></tr>
<tr><td>Summer 2020</td><td>Jefferson</td><td># students tested = 28
correct = 104
% correct = 93%</td></tr>
<tr><td></td><td>Shelby</td><td># students tested = 21
correct = 73
% correct = 87%</td></tr>
<tr><td></td><td>Clanton</td><td># students tested = 8
correct = 29
% correct = 91%</td></tr>
</table>

Total Students Tested = 192
Total Annual Success Rate: 81%
</td>
<td><u>Observations/Changes Based on Current Cycle (19/20)</u>

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)

Instructors will also add an additional assignment in support of this outcome.</td>
</tr>
<tr>
<td>2: Demonstrate an ability to identify molecular and cellular processes in</td>
<td>Student learning outcomes were assessed by using a 14 question standardized</td>
<td>70% or > successful
69% or < unsuccessful
The percent is based upon the</td>
<td>
<table>
<tr><td>Fall 2019</td><td>Jefferson</td><td># students tested = 34

correct = 113

% correct = 47%</td></tr>
</table>
</td>
<td><u>Observations/Changes Based on Current Cycle (19/20)</u>

The COVID pandemic has led to all Biology</td>
</tr>
</table>

<table>
<tr>
<td>prokaryotic and eukaryotic cells.</td>
<td>multiple choice examination at the end of the semester. A total of seven questions (Q5 – Q11) were used to assess SLO2

See Appendix A for SLO assessment questions</td>
<td>average of correctly answered questions related to SLO2</td>
<td>
<table>
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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>

Total Students Tested = 192
Total Annual Success Rate: 61%
</td>
<td>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.</td>
</tr>
<tr>
<td>3: Demonstrate an ability to recognize genetic, morphological and life cycle characteristics of bacteria, fungi, and viruses.</td>
<td>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</td>
<td>70% or > successful
69% or < unsuccessful
The percent is based upon the average of correctly answered questions related to SLO3</td>
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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>
</td>
<td><u>Observations/Changes Based on Current Cycle (19/20)</u>

It is again our goal to review resources to ensure that we are adequately covering this content.</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td>– Q14) was used to assess SLO3

See Appendix A for SLO assessment questions</td>
<td></td>
<td>
<table>
<tr><td>Summer 2020</td><td>Jefferson</td><td># students tested = 28
correct = 70
% correct = 83%</td></tr>
<tr><td></td><td>Shelby</td><td># students tested = 21
correct =52
% correct = 83%</td></tr>
<tr><td></td><td>Clanton</td><td># students tested = 8
correct = 19
% correct = 79%</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Total Students Tested = 192
Total Annual Success Rate: 63%
</td>
<td></td>
</tr>
<tr>
<td>Plan submission date:</td>
<td></td>
<td></td>
<td>Submitted by:</td>
<td></td>
</tr>
<tr>
<td colspan="3"></td>
<td colspan="2"></td>
</tr>
</table>

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 F_2 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 atoms atomic number?

4. What determines an atoms 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.

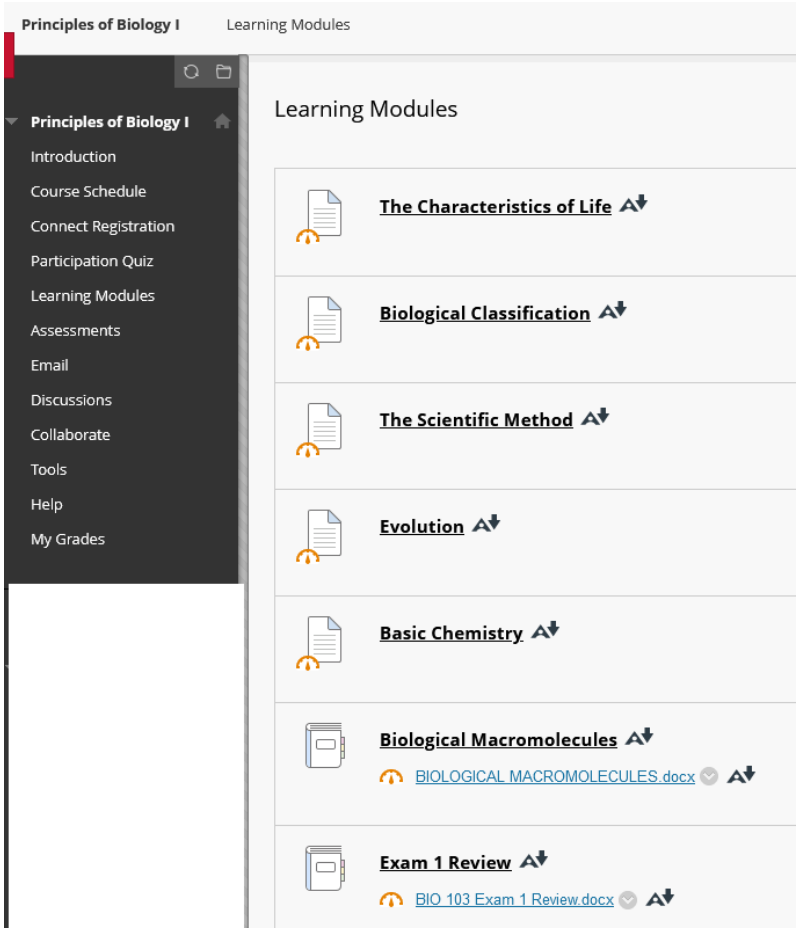
15. What is an acid? What is a base?

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



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

Heterotropic

Animal

Plant

Autotropic

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%	**Observations/Changes Based on Current Cycle (19/20)** We will provide materials related to evolution for
			Summer 2020	Jefferson	# students tested = 19 # correct = 149 % correct = 87%	
			Summer	Shelby	# students tested = 21	

	9 questions (Q1-Q6 and Q 18-20) were used to assess understanding of SLO1 See Appendix A: BIO 104 SLO Assessment	(1 to 6) related to SLO 1. (6 questions)	2020 | | # correct = 159 % correct = 84% **Total Students Tested = 52** ***Total Annual Success Rate* = 82%**	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.
2. Demonstrate an ability to identify the structural characteristics and life cycles of both plant and animal phyla.	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 See Appendix A: BIO 104 SLO Assessment	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)	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% **Total Students Tested = 52** ***Total Annual Success Rate* = 88%**	**Observations/Changes Based on Current Cycle (19/20)** 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.

<table>
<tr><td></td><td></td><td></td><td colspan="2"></td><td></td></tr>
<tr><td>3. Recognize components of population and community ecology and identify how biodiversity contributes to a stable ecosystem.</td><td>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

See Appendix A: BIO 104 SLO Assessment</td><td>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)</td><td colspan="2"><table><tr><td>Fall 2019</td><td>Jefferson</td><td># students tested = 12
correct = 49
% correct = 82%</td></tr><tr><td>Summer 2020</td><td>Jefferson</td><td># students tested = 19
# correct = 68
% correct = 72%</td></tr><tr><td>Summer 2020</td><td>Shelby</td><td># students tested = 21
# correct = 83
% correct = 79%</td></tr></table>Total Students Tested = 52
Total Annual Success Rate = 77%</td><td><u>Observations/Changes Based on Current Cycle (19/20)</u>
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.</td></tr>
<tr><td colspan="3">Plan submission date:</td><td colspan="3">Submitted by:</td></tr>
</table>

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

7) The embryonic tissue layer that will form the inner-most lining of the lungs and intestines is the_____.
A) Endoderm B) Transderm C) Mesoderm D) Ectoderm

8) The type of metazoan where the blastopore becomes the anus is the_____.
A) Protostome B) Deuterostome C) Zygote D) Bilateran

9) Malpighian tubules function as excretory organs in_____.
A) Arthropods B) Annelids C) Echinoderms D) Molluscs

10) Chordates possess all of the following characteristics some time during thier lives EXCEPT:
A) ventral nerve cord B) postanal tail
C) notocord D) pharyngeal slits

11) Mites and ticks belong to the order_____.
A) Diplopoda B) Araneae C) Acari D) Chilopoda

12) Amphibians likely evolved from
A) cartilagenous fisbes B) very primitive fishes
C) lobe-finned bony fishes D) ray-finned bony fisbes

13) The term "habitat" is defined as:
A) The ecological role that a particular species plays in it's environment.
B) The environment where a specific individual is found.
C) The specific location of a community.
D) A major type of ecosysten that covers a large geographic region of the Earth.

14) A school of fishes provides an example of the_____pattern of dispersion.
A) Clumped B) uniform C) random D) clustered

15) Which of the following is true of the exponential growth model?

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) mutalistic 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 primarilly 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

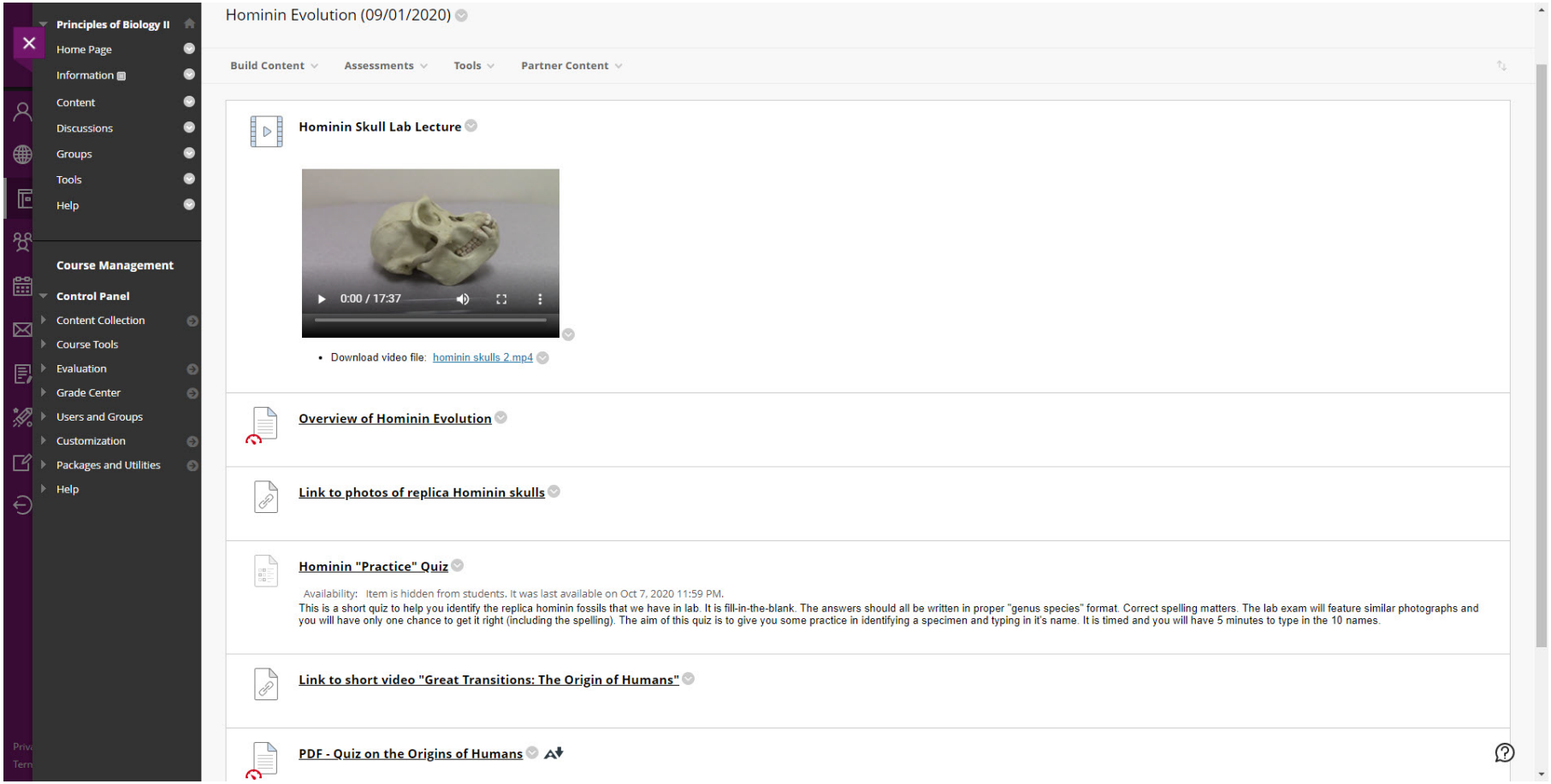
ACCESS TO A RELIABLE HIGH-SPEED INTERNET CONNECTION IS REQUIRED.
Lectures, streaming data, other essential resources and all exams will be posted on Blackboard.

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.

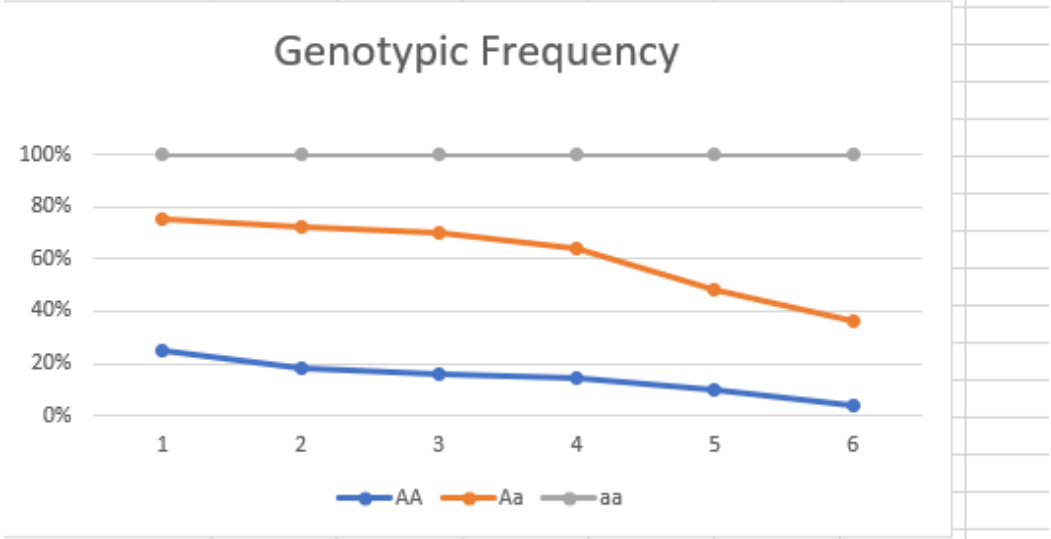
LABORATORY: Students are expected to dissect and/or examine preserved specimens as part of the laboratory experience. Old clothes or a lab coat, goggles and non-sterile latex gloves are required during these activities. Gloves and goggles are not provided and may be obtained at drug or home improvement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

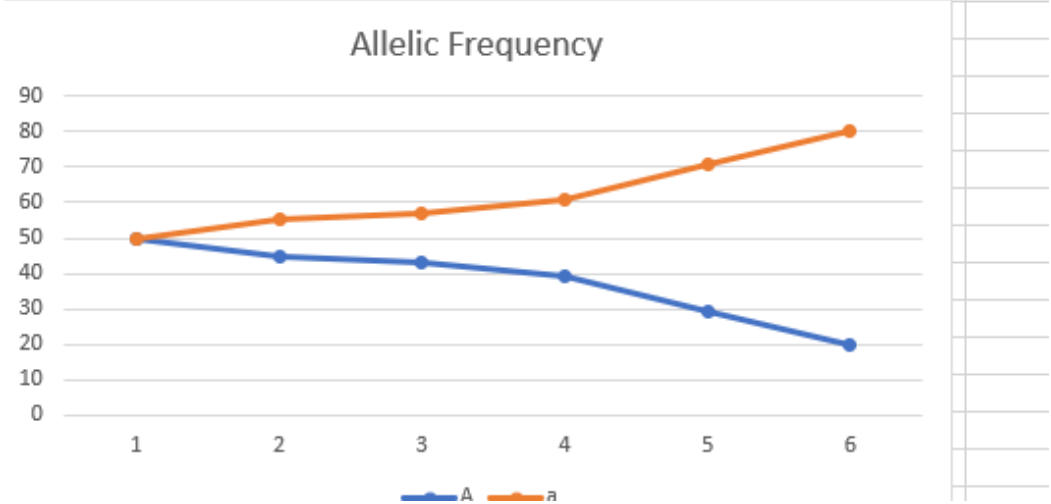
ATTENDANCE Students are expected to attend all classes for which they are registered. Students who are unable to attend class regularly, regardless of the reason or circumstance, should withdraw from that class before poor attendance interferes with the student's ability to achieve the objectives required 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.

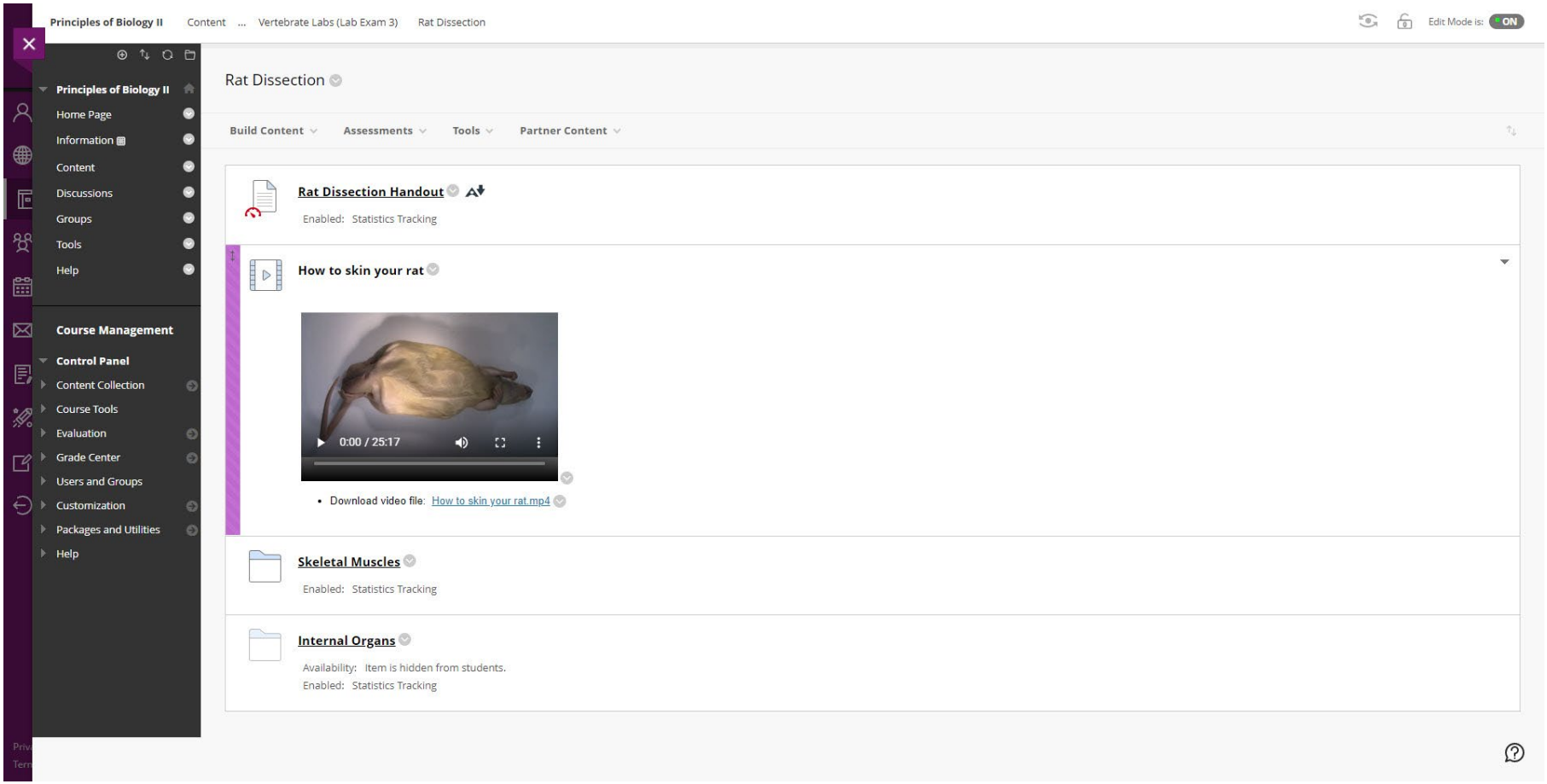


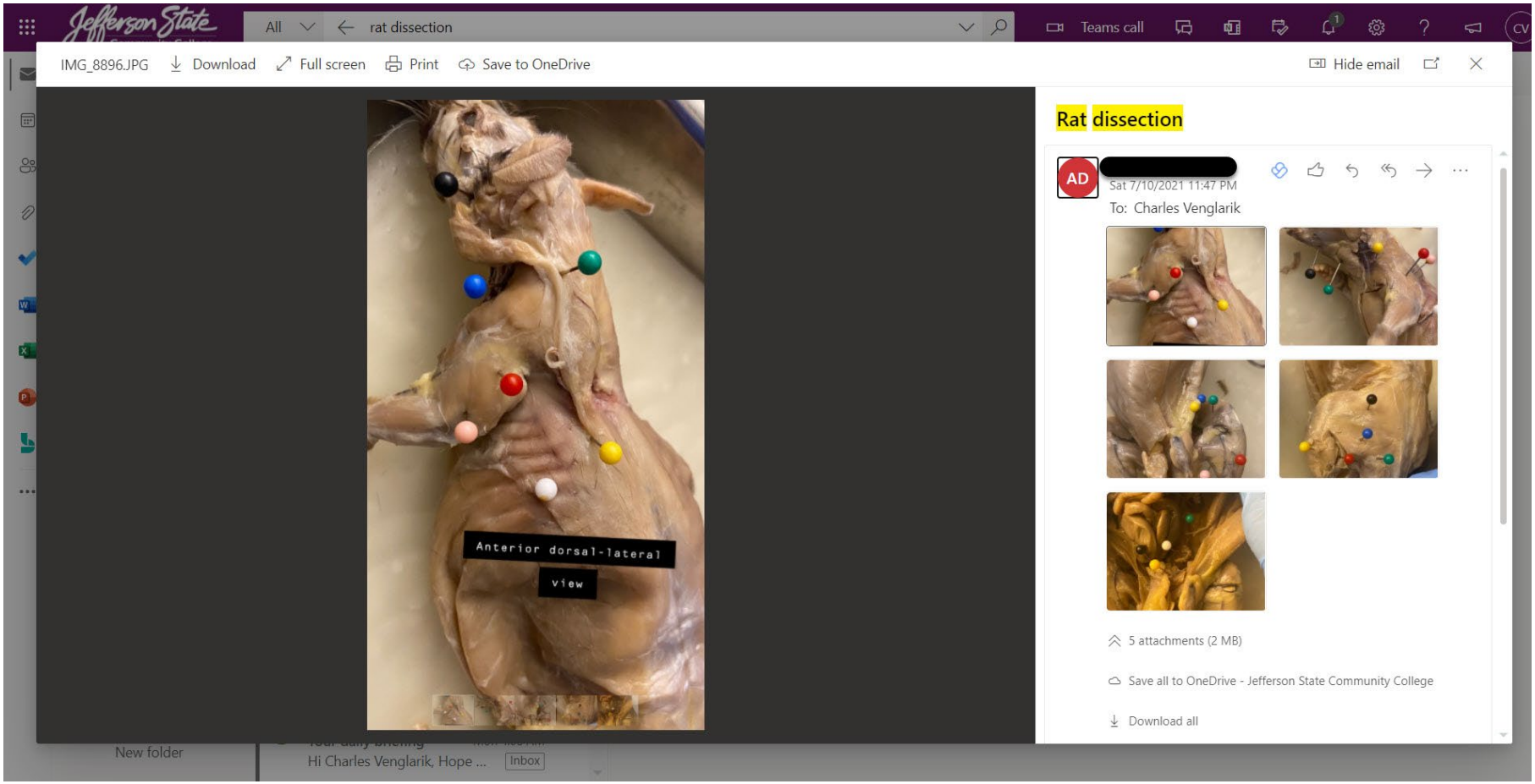
	AA	Aa	aa		A	a
Gen 0 expected	12.5	25	12.5		50	50
Gen 1 observed	9	27	14		45	55
Gen 2 observed	8	27	15		43	57
Gen 3 observed	7	25	18		39	61
Gen 4 observed	5	19	26		29	71
Gen 5 observed	2	16	32		20	80



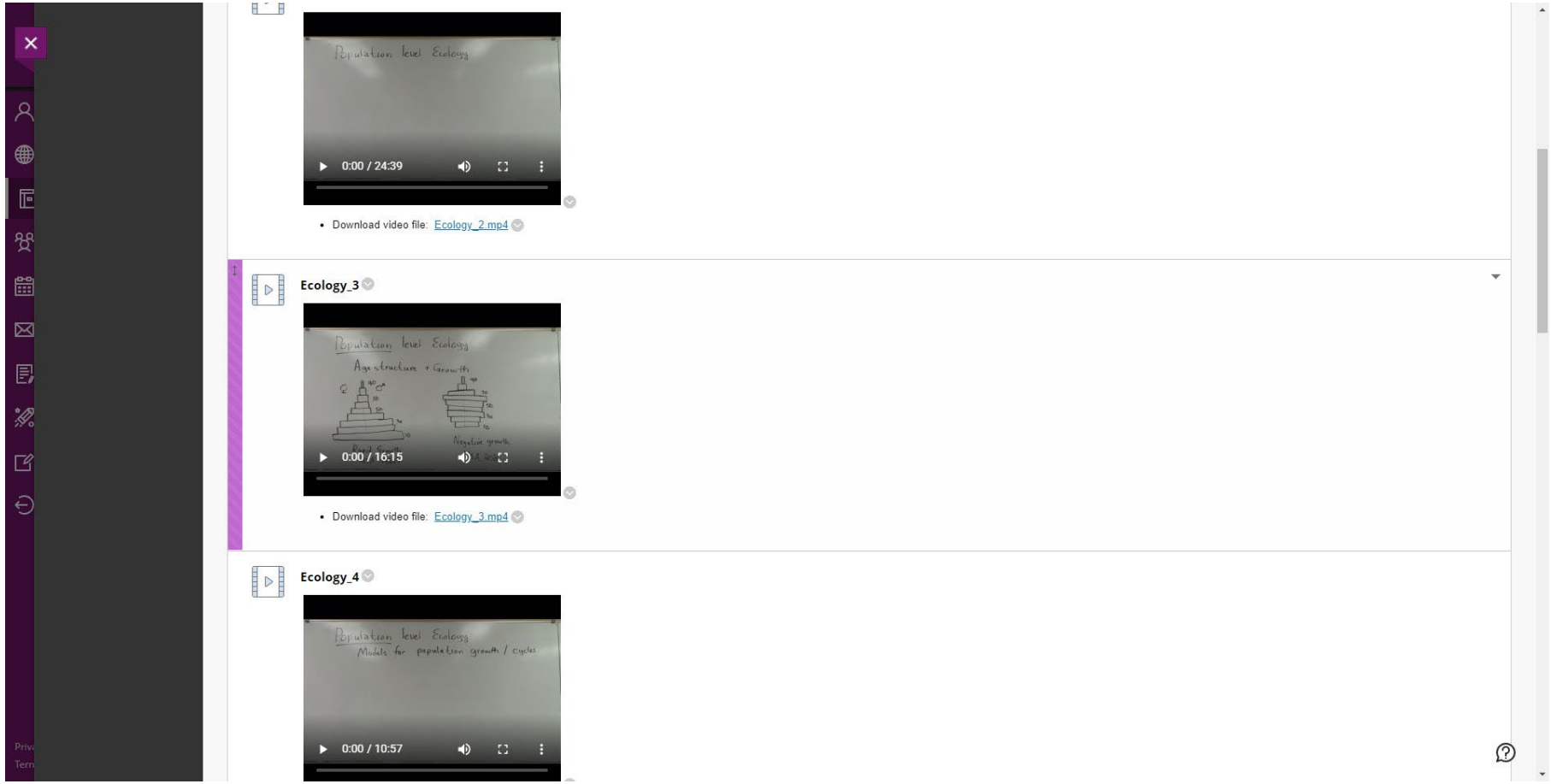


Evidence for SLO 2: Various dissection units including the rat and the shark. Students pick up a kit at the beginning of the semester with all necessary materials. The LMS contains a handout, and a dissection video to aid students in completing the dissection.




Jefferson State
All
rat dissection
Teams call
IMG_8896.JPG
Download
Full screen
Print
Save to OneDrive
Hide email
Anterior dorsal-lateral
view
Rat dissection
AD
[redacted]
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



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	

<table>
<tr>
<td></td>
<td>used to assess SLO1</td>
<td></td>
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<table>
<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>
Total Students Tested = 622
Total Annual Success Rate = 79%
</td>
<td>rate of success was 79%

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.</td>
</tr>
<tr>
<td>SLO 2: Identify and recognize the distinct characteristics of the systems listed below

A. Integumentary System
B. Skeletal System</td>
<td>Student learning outcomes were assessed by using a 16 question standardized multiple choice</td>
<td>Correct responses by 70% of the students for each SLO will be defied as a</td>
<td>
<table>
<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>
</td>
<td>The students tested met the requirements for success for SLO 2.</td>
</tr>
</table>

C. Muscular System D. Nervous System	examination at the end of the semester. A total of 4 questions (Q5, Q8, Q11, and Q14) were used to assess SLO2	successful outcome.			% correct = 75%	The success rate for SLO 2 78% which represents an increase from last years rate of success (73%) 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. We will continue to stress the details of each organ system in both lecture and lab throughout the semester. We will also work to make materials available online to the students
				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%	
			Total Students Tested = 622 ***Total Annual Success Rate* = 78%**			

<table>
<tr><td></td><td></td><td></td><td></td><td>throughout the semester.</td></tr>
<tr><td>SLO 3: Recognize the relationship between structural organization and function</td><td>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</td><td>Correct responses by 70% of the students for each SLO will be defied as a successful outcome.</td><td>
<table>
<tr><td>Fall 2019</td><td>Jefferson</td><td># students tested = 123
correct = 275
% correct = 56%</td></tr>
<tr><td></td><td>Shelby</td><td># students tested = 212
correct = 476
% correct = 56%</td></tr>
<tr><td></td><td>Clanton</td><td># students tested = 81
correct = 220
% correct = 68%</td></tr>
<tr><td></td><td>Pell City</td><td># students tested = 64
correct = 130
% correct = 51%</td></tr>
<tr><td>Summer 2020</td><td>Jefferson</td><td># students tested = 51
correct = 159
% correct = 78%</td></tr>
<tr><td></td><td>Shelby</td><td># students tested = 77
correct = 251
% correct = 81%</td></tr>
<tr><td></td><td>Clanton</td><td># students tested = 14
correct = 49
% correct = 89%</td></tr>
</table>
Total Students Tested = 622
Total Annual Success Rate = 63%</td><td>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</td></tr>
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<td>significantly lower rate of success, suggesting it may be problematic. We will evaluate other potential questions to replace that question in the assessment.</td>
</tr>
<tr>
<td>SLO 4: Define homeostasis and identify the role of homeostasis within and between appropriate systems</td>
<td>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</td>
<td>Correct responses by 70% of the students for each SLO will be defied as a successful outcome.</td>
<td>
<table>
<tr><td>Fall 2019</td><td>Jefferson</td><td># students tested = 123
correct =219
% correct = 89%</td></tr>
<tr><td></td><td>Shelby</td><td># students tested = 212
correct = 374
% correct = 88%</td></tr>
<tr><td></td><td>Clanton</td><td># students tested = 81
correct = 132
% correct = 81%</td></tr>
<tr><td></td><td>Pell City</td><td># students tested = 64
correct = 70
% correct = 55%</td></tr>
<tr><td>Summer 2020</td><td>Jefferson</td><td># students tested = 51
correct = 97
% correct = 95%</td></tr>
<tr><td></td><td>Shelby</td><td># students tested = 77
correct = 144
% correct = 94%</td></tr>
<tr><td></td><td>Clanton</td><td># students tested = 13
correct = 28
% correct = 100%</td></tr>
</table>
Total Students Tested = 622
Total Annual Success Rate = 86%
</td>
<td>The students tested did meet the requirements for success for SLO 4.

The success rate for SLO 4 is 86% which is consistent with the rate of success from last year.

We will continue to stress the importance of homeostasis in</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td>each organ system.</td></tr>
<tr><td>SLO 5: Identify the major structures of each system

A.Integumentary System

B.Skeletal System

C.Muscular System

D.Nervous System</td><td>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</td><td>Correct responses by 70% of the students for each SLO will be defied as a successful outcome.</td><td>
<table>
<tr><td>Fall 2019</td><td>Jefferson</td><td># students tested = 123
correct = 364
% correct = 74%</td></tr>
<tr><td></td><td>Shelby</td><td># students tested = 212
correct = 656
% correct = 77%</td></tr>
<tr><td></td><td>Clanton</td><td># students tested = 81
correct = 246
% correct = 76%</td></tr>
<tr><td></td><td>Pell City</td><td># students tested = 64
correct = 187
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<tr><td>Summer 2020</td><td>Jefferson</td><td># students tested = 51
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correct = 252
% correct = 82%</td></tr>
<tr><td></td><td>Clanton</td><td># students tested = 14
correct = 55
% correct = 98%</td></tr>
</table>

Total Students Tested = 622
Total Annual Success Rate = 78%</td><td>The students tested did meet the requirements for success for SLO 5.

The success rate for SLO 5 is 78% which is slightly higher than the rate of success last year (76%).

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.</td></tr>
</table>

Plan submission date:	Submitted by:

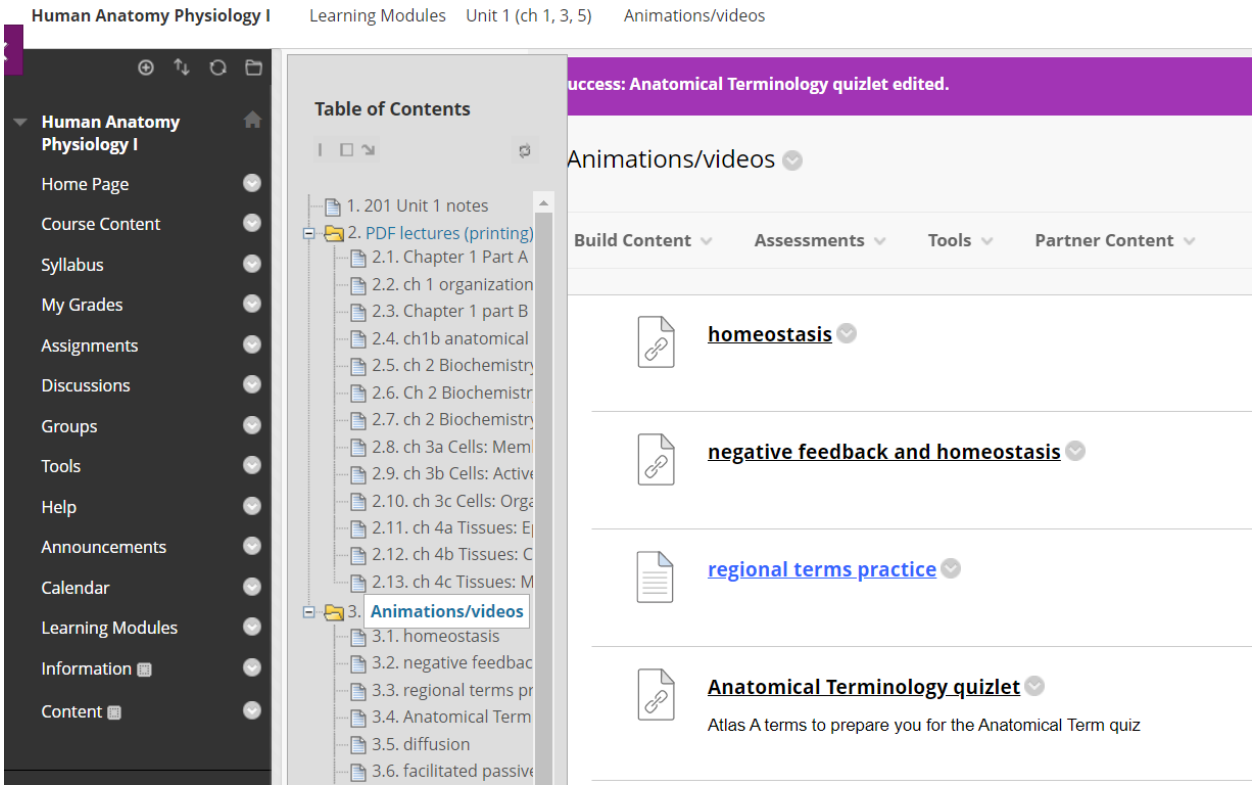
BIO 201 MW 10am Course Outline-Fall 2019

Tentative and Subject to Change*

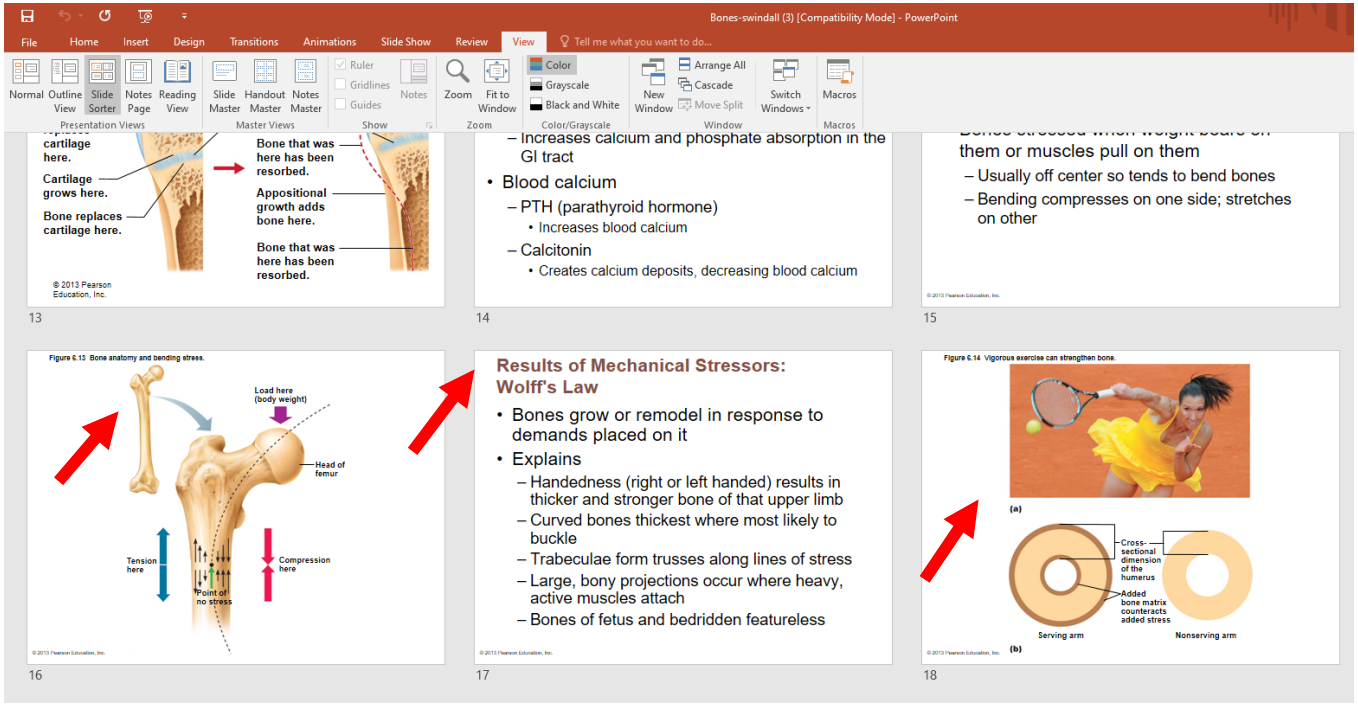
Date	Monday Lecture	Lab (Mon)	Date	Wednesday Lecture
8/19	Class Policies and Introduction Intro To Anatomy-CH1	NO LAB	8/21	Intro To Anatomy & Anatomical Terminology -CH1
8/26	Chemistry-Ch2	Microscope Histology	8/28	Histology-Ch 4 **Vocab Quiz #1 (a- to den-)**
9/2	NO CLASS Labor Day	Torso Model	9/4	Integumentary 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.

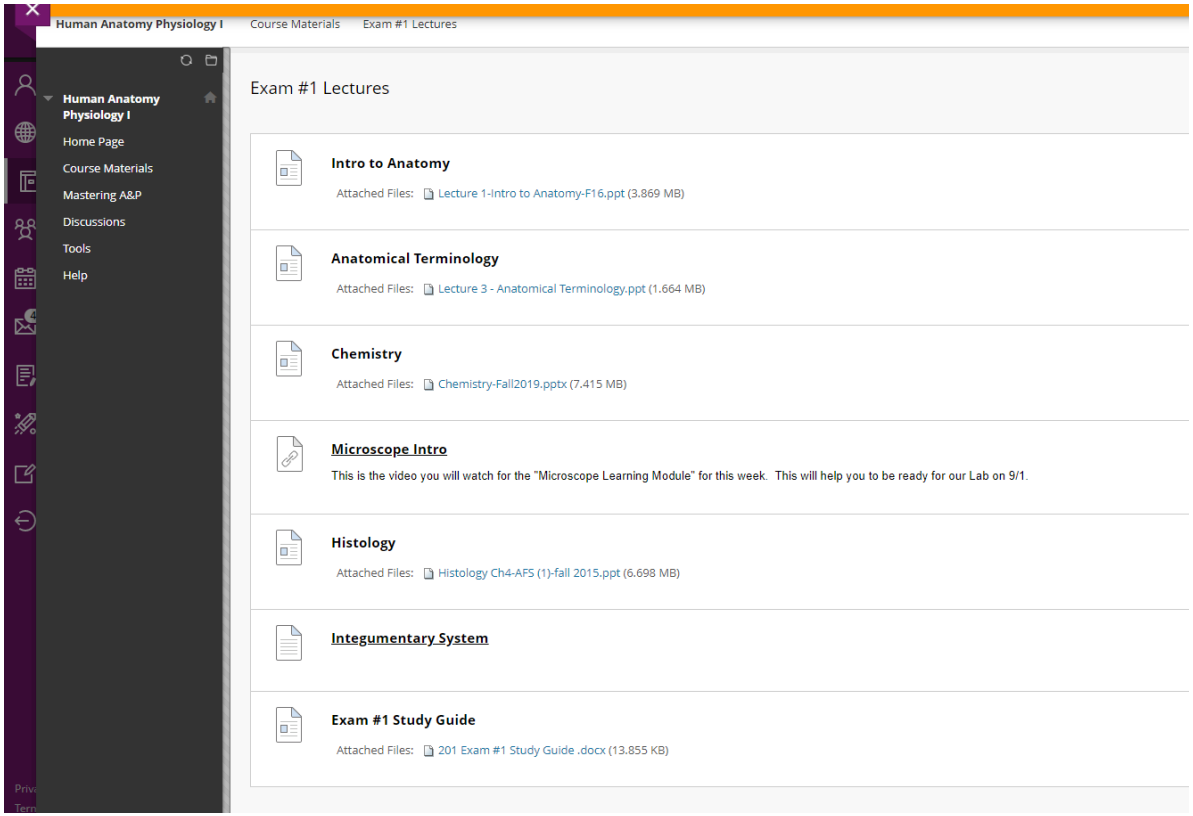
SLO 1- BB Shell showing quizlets to reinforce both regional and directional terms. All Blackboard material is available throughout the semester.



Slides from lecture showing relationship between bone structure and function.



Blackboard shell showing all lecture material available to students online.



BIO 201 MW 10am Course Outline-Fall 2019

Tentative and Subject to Change*

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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-)**
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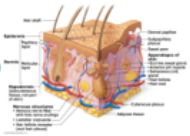
10/14	**Lecture Exam #2**	Skeleton Review	10/16	**Lab Exam #2** During Lecture Period
10/21	Muscular System 1 Ch 10	Muscles-face, back, head, neck,torso	10/23	Muscular System 2 Ch 10 **Vocab Quiz #3 (kine- to philo)**
11/28	Muscular System 3	Muscles of Upper Limb Handout Lab Quiz	11/30	Muscles 4
11/4	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.

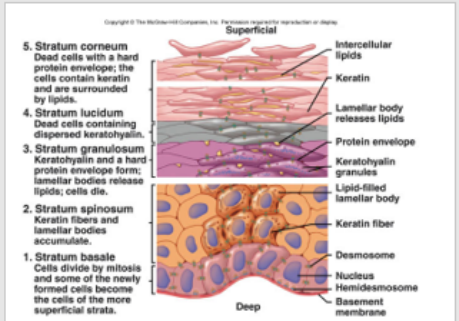
SLO 2 - Example of PowerPoint from Integumentary system showing details for this system.

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



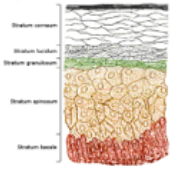
3



4

Layers of the Epidermis: Stratum Granulosum (Granular Layer)

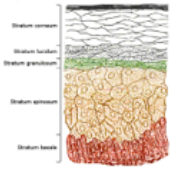
- Thin - four to six cell layers
- Cell appearance changes
  - Cells flatten
  - Nuclei and organelles disintegrate
  - Keratinization begins
    - Cells accumulate keratohyaline granules
  - Cell accumulate lamellar granules
- **Cells above this layer die**
  - Too far from dermal capillaries



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



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

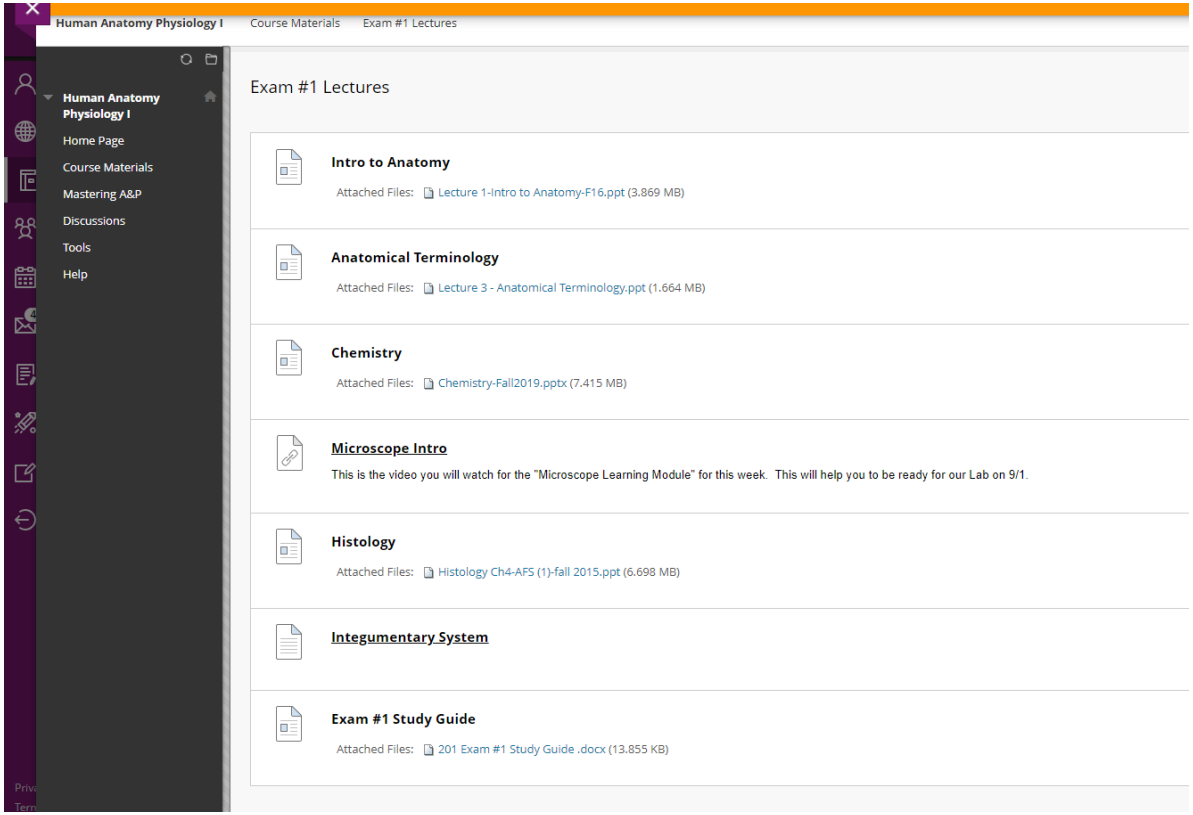
13

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

14

Blackboard shell showing all lecture material available to students online.



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

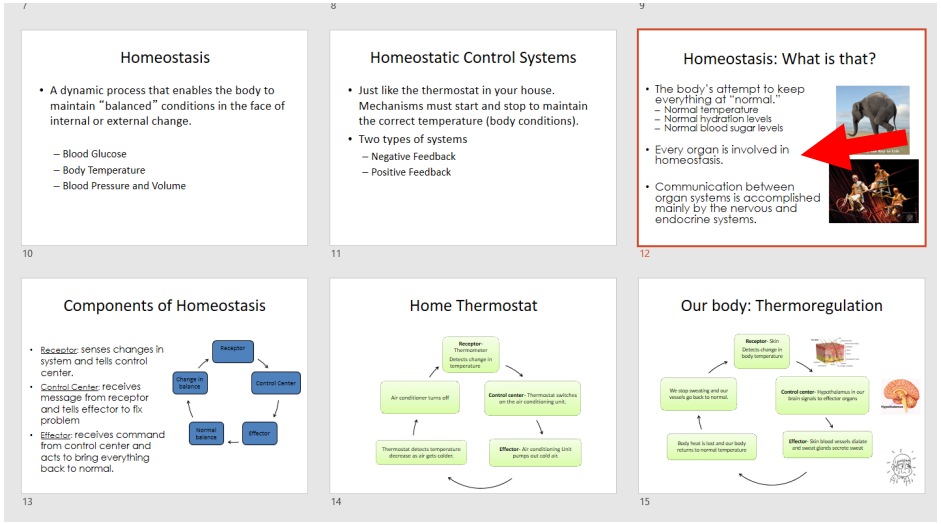
BIO 104: Incorporate more in class discussion, discuss current topics, incorporate videos

BIO 201: update and reassess some questions

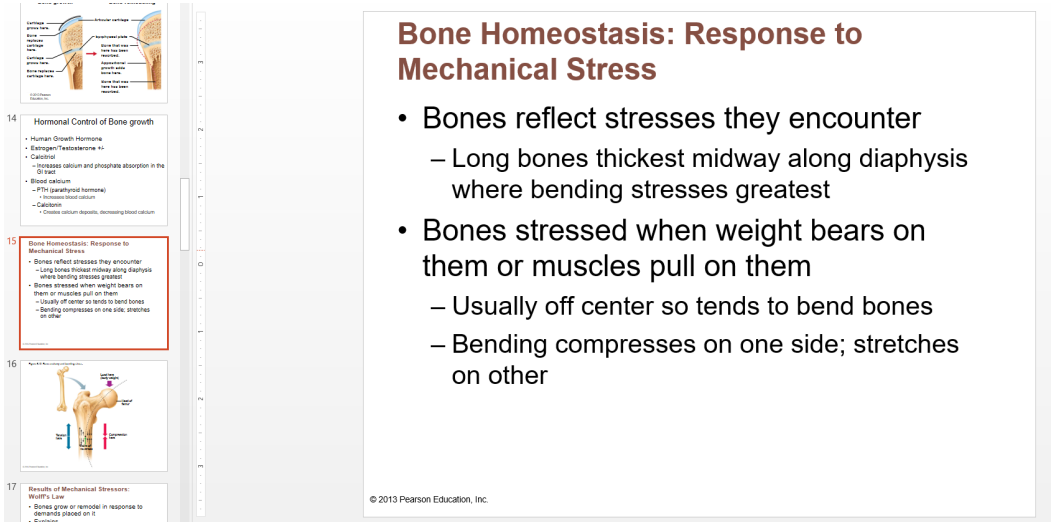
BIO 202: No change

BIO 220: evaluate q 2 and q 3 of assessment

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



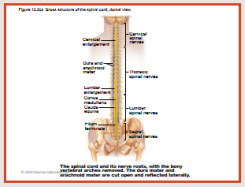
Lecture Notes from BIO 201 showing bone homeostasis being discussed.



SLO 5: BIO 201 Lecture notes showing major structures (spinal cord) in central nervous system.

Clipboard | Slides | Font | Paragraph | Drawing | Editing

33

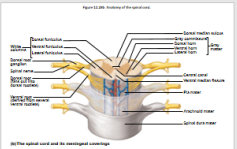


34

Spinal Cord

- **Spinal nerves** (Part of PNS)
  - 31 pairs
- Cervical and lumbosacral enlargements
  - Nerves serving upper and lower limbs emerge here
- **Cauda equina**
  - Collection of nerve roots at inferior end of vertebral canal

35

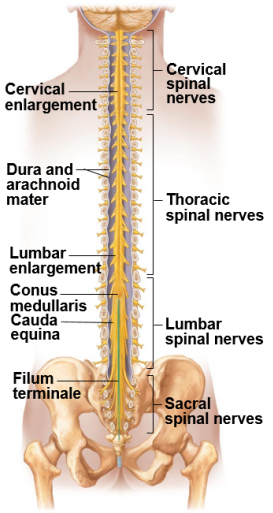


36

White and Gray Matter in CNS

- **Gray Matter**
  - Mostly neural cell bodies
  - Inside on spinal cord, outside in brain

Figure 12.26a Gross structure of the spinal cord, dorsal view.



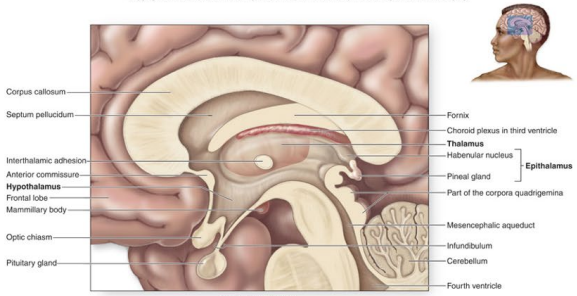
The spinal cord and its nerve roots, with the bony vertebral arches removed. The dura mater and arachnoid mater are cut open and reflected laterally.

Click to add notes

academic.kellogg.cc.mi.us/herbrandsonc/bio201...

Diencephalon

- Epithalmus – Pineal Body-sleep/wake cycles
- Thalamus – Third Ventricle
- Hypotalamus – Pituitary Gland



Midsagittal section

Click to add notes

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

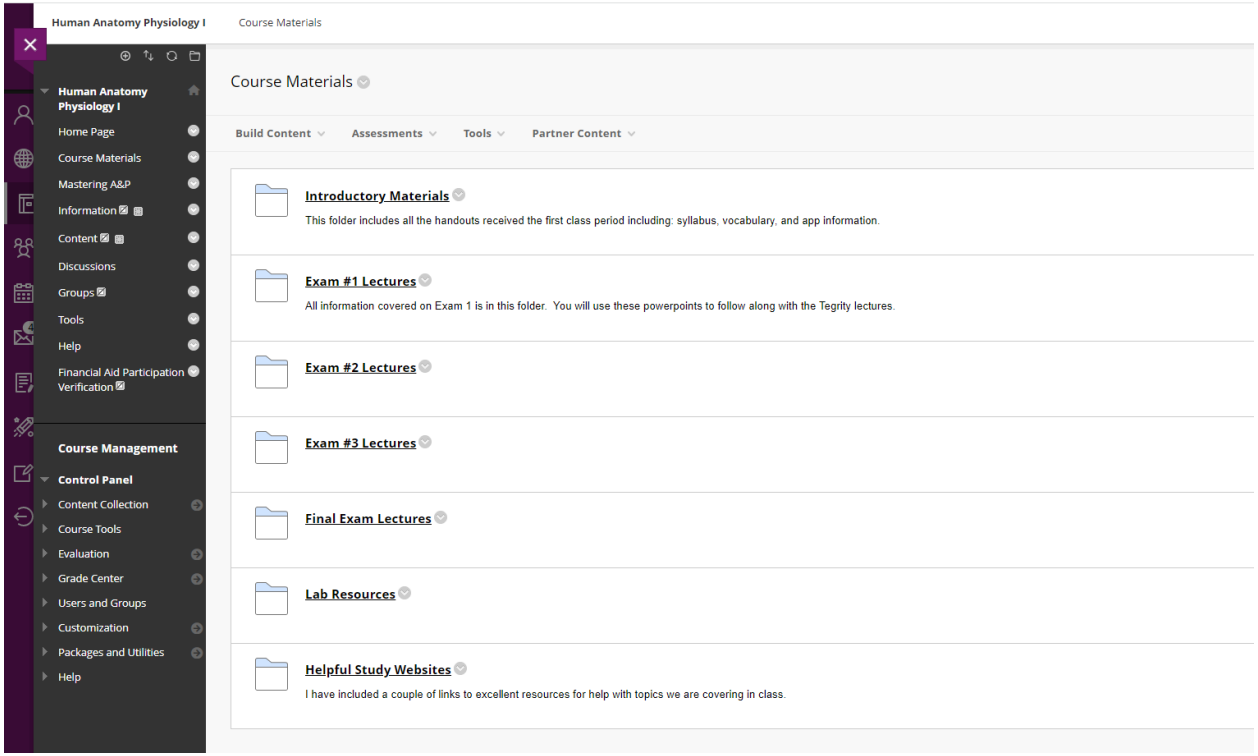
Studies have shown that drawing, labelling and coloring in anatomical structures can lead to a greater familiarity with the structures and therefore a better grade on exams. Each unit you will have a selection of structures that you must draw, color and label. You do not have to draw freehand – you may 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

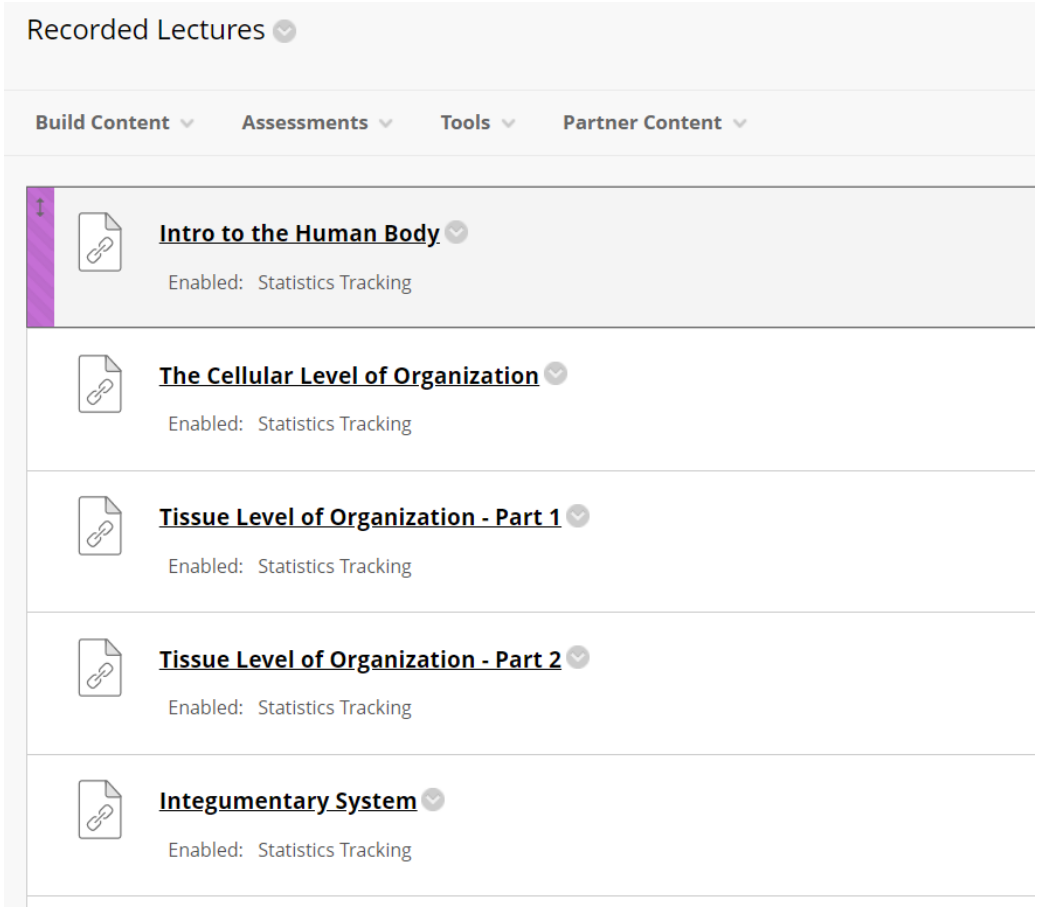
The Human Torso:
Draw, color, and label the following structures from the human torso
The brain, carotid artery, jugular vein, thyroid, larynx, trachea, bronchi, esophagus, heart, lungs, diaphragm, liver, gallbladder, stomach, pancreas, spleen, small intestines, greater omentum, large intestines, rectum, 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.



Blackboard shell showing recorded lectures available throughout the semester.

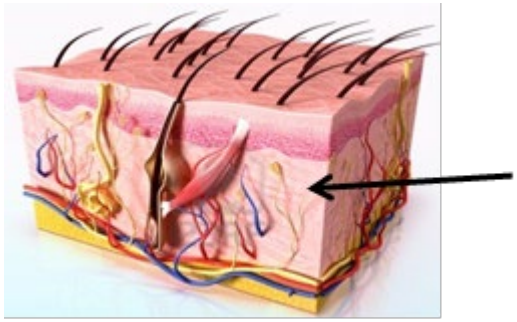


Biology 201 Comprehensive Survey

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

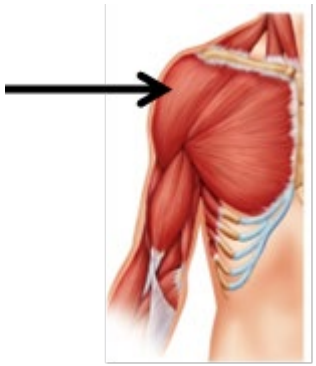
5. **(SLO2A)** The cell that produces melanin is called
    a. Kerotinocyte
    b. Melanocyte
    c. Melanogenic cell
    d. Dendritic cell
    e. Chondroblast

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

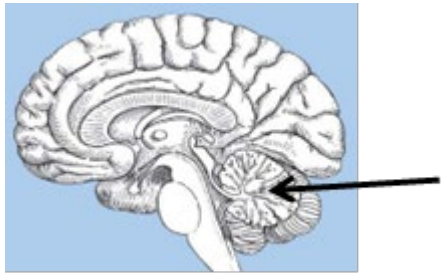
8. **(SLO2B)** The cell type responsible for building bone is _____.
    a. Myocyte
    b. Chondrocyte
    c. Osteoclast
    d. Osteoblast

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 _____.
    a. Acetylcholine (ACh)
    b. Dopamine
    c. Acetylcholinesterase (AChE)
    d. Myosin



12. **(SLO5D)** The arrow is pointing to which structure in the brain?
    a. Corpus callosum
    b. Cerebellum
    c. Midbrain
    d. Pons
    e. Thalamus

13. **(SLO3C)** The pelvic girdle lacks the mobility of the _____, but is far more stable due to the acetabulum and strong ligaments.
    a. Radius and ulna
    b. Vertebral column
    c. Pectoral girdle
    d. Pubic bone

14. **(SLO2D)** There are ____ pairs of cranial nerves.
    a. 2
    b. 7
    c. 12
    d. 31

15. **(SLO4)** _____ is the ability of the body to maintain stable internal conditions.
    a. Refraction
    b. 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. 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.		Shelby	# students tested = 52 #correct = 211 % correct = 81%	from last year (73%).
				Clanton	# students tested = 15 #correct = 67 % correct = 89%	We will 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 due to continual access to course materials and lectures, and the student being able to continually review material in order to master the learning

Total Students Tested = 328
***Total Annual Success Rate* = 75%**

<table>
<tr><td></td><td></td><td></td><td></td><td>outcome information.</td></tr>
<tr><td>2: Define homeostasis and identify the role of homeostasis within and between appropriate systems.</td><td>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.</td><td>70% or > successful

69% or < unsuccessful

The percent is based upon the average of correctly answered questions related to SLO2.</td><td>
<table>
<tr><td>Fall 2019</td><td>Jefferson</td><td># students tested = 47
#correct = 76
% correct = 81%</td></tr>
<tr><td></td><td>Shelby</td><td># students tested = 119
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<tr><td></td><td>Clanton</td><td># students tested = 15
#correct = 30
% correct = 100%</td></tr>
</table>
Total Students Tested = 328
Total Annual Success Rate = 85%</td><td>The students tested did meet the requirements for success for SLO 2.

The success rate for SLO 2 is 85% which is a slight increase in success from last year (81%).

We will continue to stress the importance of homeostasis in each chapter and with each organ system.</td></tr>
<tr><td>3: Recognize the major structures of each system listed below.

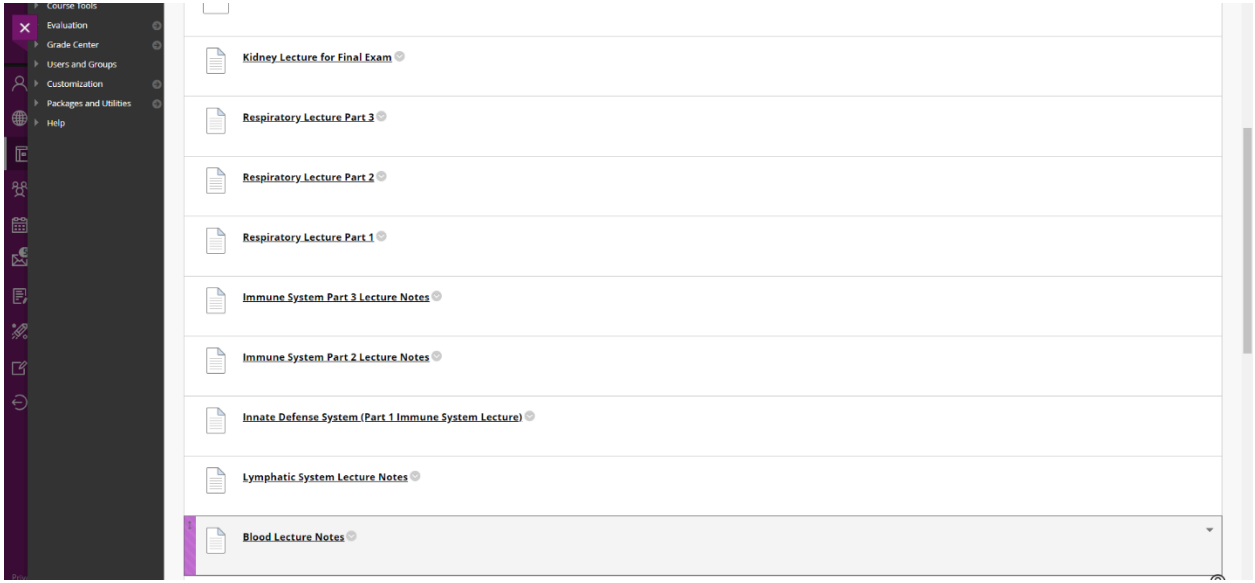
A. Endocrine System</td><td>Student learning outcomes were assessed by using a 12</td><td>70% or > successful

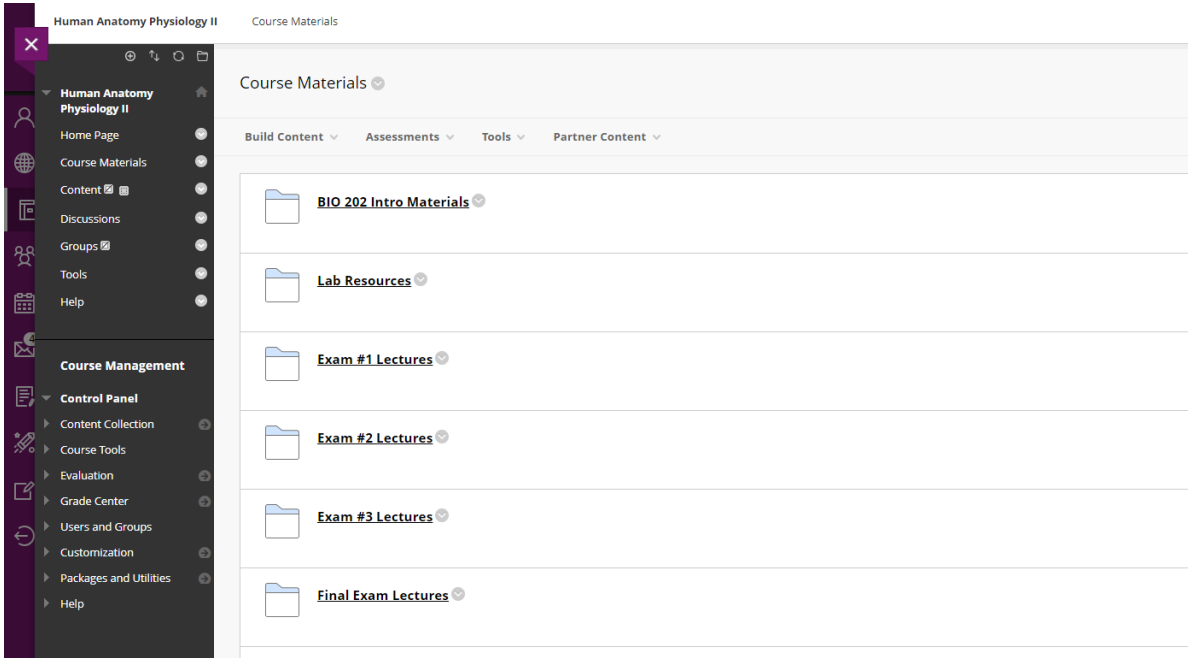
69% or < unsuccessful</td><td>
<table>
<tr><td>Fall 2019</td><td>Jefferson</td><td># students tested = 47
#correct = 207
% correct = 88%</td></tr>
<tr><td></td><td>Shelby</td><td># students tested = 119
#correct = 491
% correct = 83%</td></tr>
</table>
</td><td>The students tested did meet the requirements for</td></tr>
</table>

B. Cardiovascular System C. Lymphatic and Immune System D. Respiratory System E. Digestive System F. Urinary System G. Reproductive System	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.	The percent is based upon the average of correctly answered questions related to SLO3.	<table><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> **Total Students Tested = 328** ***Total Annual Success Rate* = 85%**	success for SLO 3. The success rate for SLO 3 is 85% which is a slight increase in success from last year (81%). 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

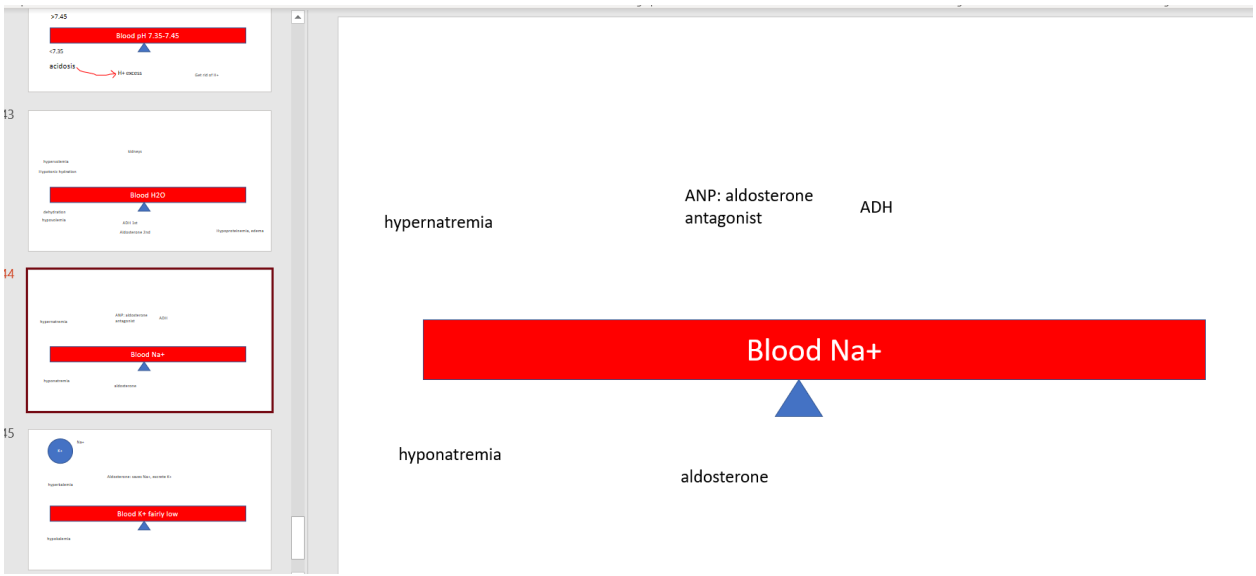
				due to continual access to course materials and lectures and students being able to continue their efforts to master material throughout the duration of the course.
Plan submission date:			**Submitted by:**	

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

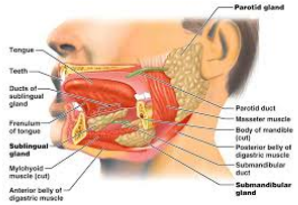
esophagus
stomach
- fundus
- body
- pylorus
- rugae
- pyloric sphincter
- esophageal sphincter

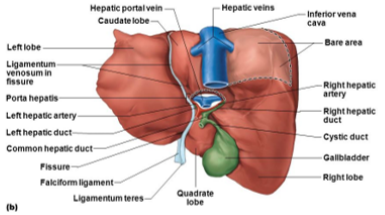
small intestine
- duodenum: duodenal papilla
- jejunum
- ileum
- ileocecal valve

large intestine
- 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



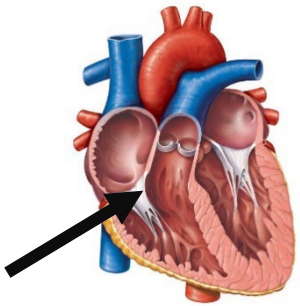


Biology 202 SLO Assessment

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

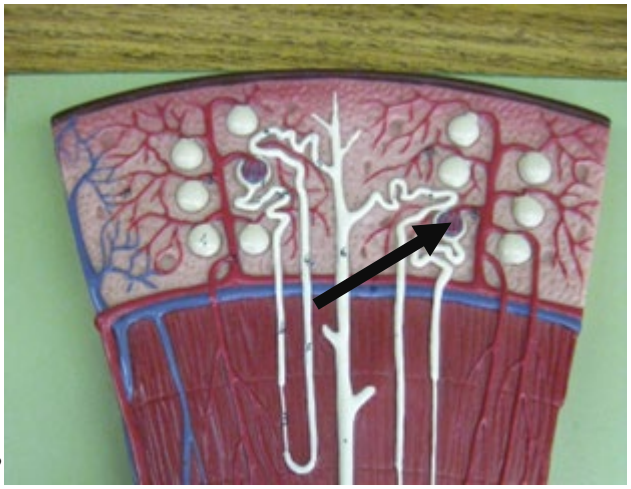
6. **(SLO 2)** The component of blood responsible for clotting is
   A. Erythrocytes
   B. Platelets
   C. Leukocytes
   D. Hemoglobin

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
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.	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.	70% or > successful 69% or < unsuccessful The percent is based upon the average of correctly answered questions related to SLO-1.	Fall 2019	Jefferson	#Students Tested = 36 #Correct = 27 %Correct = 38%	**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.
				Shelby	#Students Tested = 73 # correct = 54 % correct = 37%	
				Clanton	#Students Tested= 23 # correct = 43 % correct = 93%	
				Pell City	#Students Tested = 14 # correct = 22 % correct = 79%	
			Summer 2020	Jefferson	#Students Tested = 44 # correct = 58 % correct = 66%	

<table>
<tr>
<td></td>
<td>See Appendix A: BIO 220 SLO Assessment</td>
<td></td>
<td>
<table>
<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>
</table>
Total Students Tested = 294
Total Annual Success Rate = 58%
</td>
<td>We will, therefore, continue to emphasize the differences between prokaryotic and eukaryotic cells throughout the semester, in lecture and lab as applicable.</td>
</tr>
<tr>
<td>SLO 2: Recognize the metabolic and genetic pathways in microorganisms as well as the clinical and industrial applications of these properties.</td>
<td>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.

See Appendix A: BIO 220 SLO Assessment</td>
<td>70% or > successful

69% or < unsuccessful

The percent is based upon the average of correctly answered questions related to SLO-2.</td>
<td>
<table>
<tr><td>Fall 2019</td><td>Jefferson</td><td>#Students Tested = 36
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%Correct = 56%</td></tr>
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% 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>
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</td>
<td>Observations/Changes:

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%).</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td></td>
<td>
<table>
<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>
Total Students Tested = 294
Total Annual Success Rate = 71%
</td>
<td>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.</td>
</tr>
<tr>
<td>SLO 3: Identify the relationship between microorganism infection and disease, interactions with the host immune system, and various methods for controlling the growth and</td>
<td>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-</td>
<td>70% or > successful

69% or < unsuccessful

The percent is based upon the average of correctly answered</td>
<td>
<table>
<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>
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</td>
<td>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</td>
</tr>
</table>

<table>
<tr>
<td>dissemination of microorganisms.</td>
<td>Q7) were used to assess SLO-3.

See Appendix A: BIO 220 SLO Assessment</td>
<td>questions related to SLO-3.</td>
<td>
<table>
<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>
</table>
Total Students Tested = 294
Total Annual Success Rate = 89%
</td>
<td>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)</td>
</tr>
<tr>
<td>SLO 4: Recognize proper laboratory technique and protocols including aseptic technique, media selection, slide preparation, and microscopy.</td>
<td>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</td>
<td>70% or > successful

69% or < unsuccessful

The percent is based upon the average of correctly answered</td>
<td>
<table>
<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>
</td>
<td>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%).</td>
</tr>
</table>

<table>
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<td></td>
<td>See Appendix A: BIO 220 SLO Assessment</td>
<td>questions related to SLO-4</td>
<td>
<table>
<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>
Total Students Tested = 294
Total Annual Success Rate = 81%
Fall 2019
</td>
<td>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.</td>
</tr>
<tr>
<td colspan="2">Plan submission date: 2019-2020 Year</td>
<td colspan="3">Submitted by: Stephanie Miller</td>
</tr>
</table>

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.
    a. RNA, RNA
    b. RNA, DNA
    c. DNA, DNA
    d. DNA, RNA
    e. DNA, protein

SLO 3

6. What are microbes that cause diseases in all humans called?
    a. Normal Flora
    b. Transient Flora
    c. Pathogens
    d. Opportunistic Pathogens
    e. None of the above

7. The destruction of all microbial growth, including endospores, is called _____.
    a. Sanitation
    b. Disinfection
    c. Sterilization
    d. All of the above
    e. None of the above

SLO 4

8. When inoculating an agar slant from a broth, what should be used?
    a. Inoculating Loop
    b. Inoculating Needle
    c. Inoculating Spatula
    d. Inoculating Dropper
    e. None of the above

9. When inoculating a new growth media from a pure bacterial culture, the biggest concern is _____?
    a. Not transferring enough bacteria
    b. Transferring too much bacteria
    c. Contamination
    d. 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. **Nucleiod 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. **Pillus**-- 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

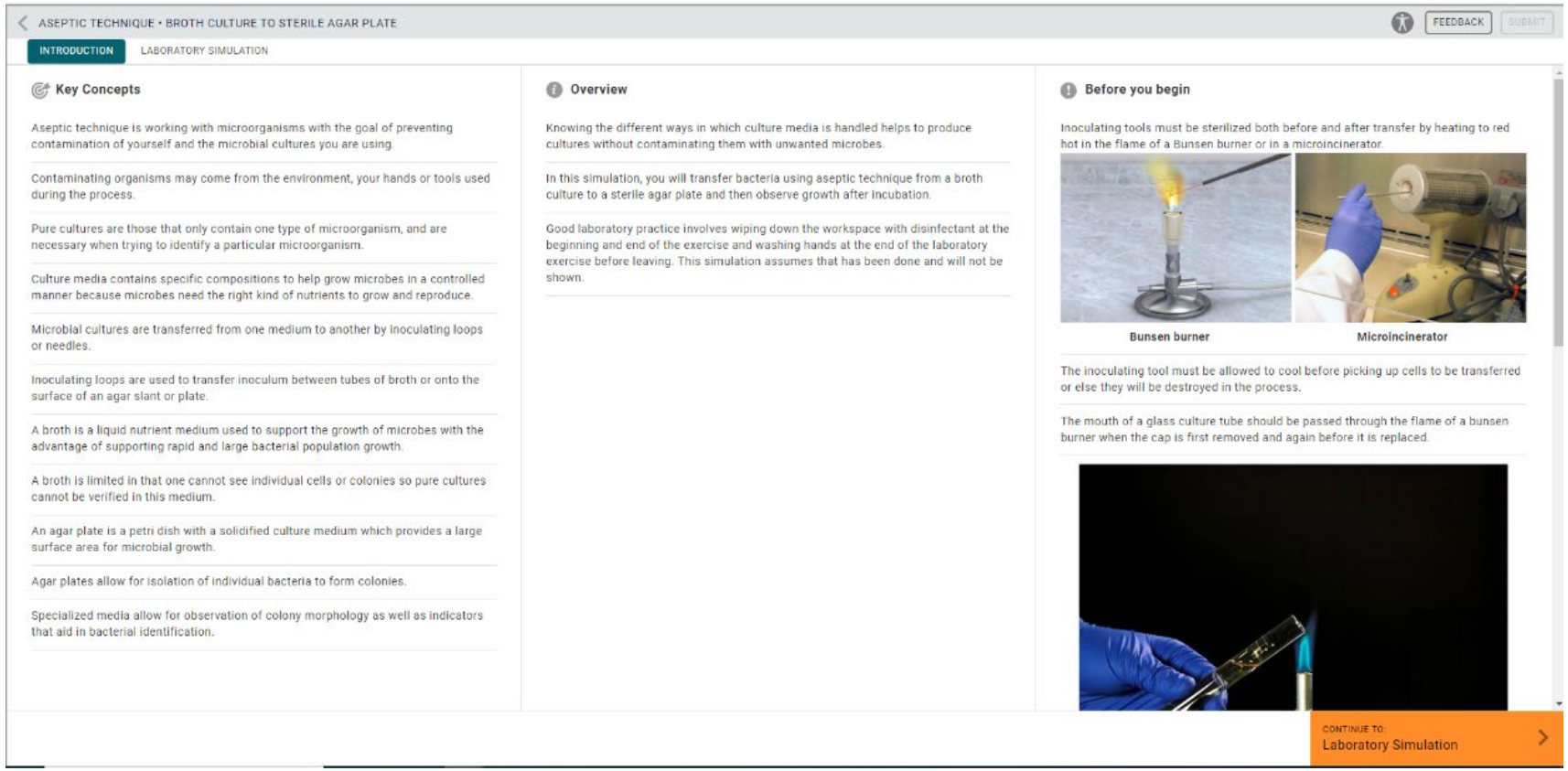
12. Chloroplast – site of photosynthesis. Like the mitochondria it has its own DNA and ribosomes that are similar to prokaryotes.

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.

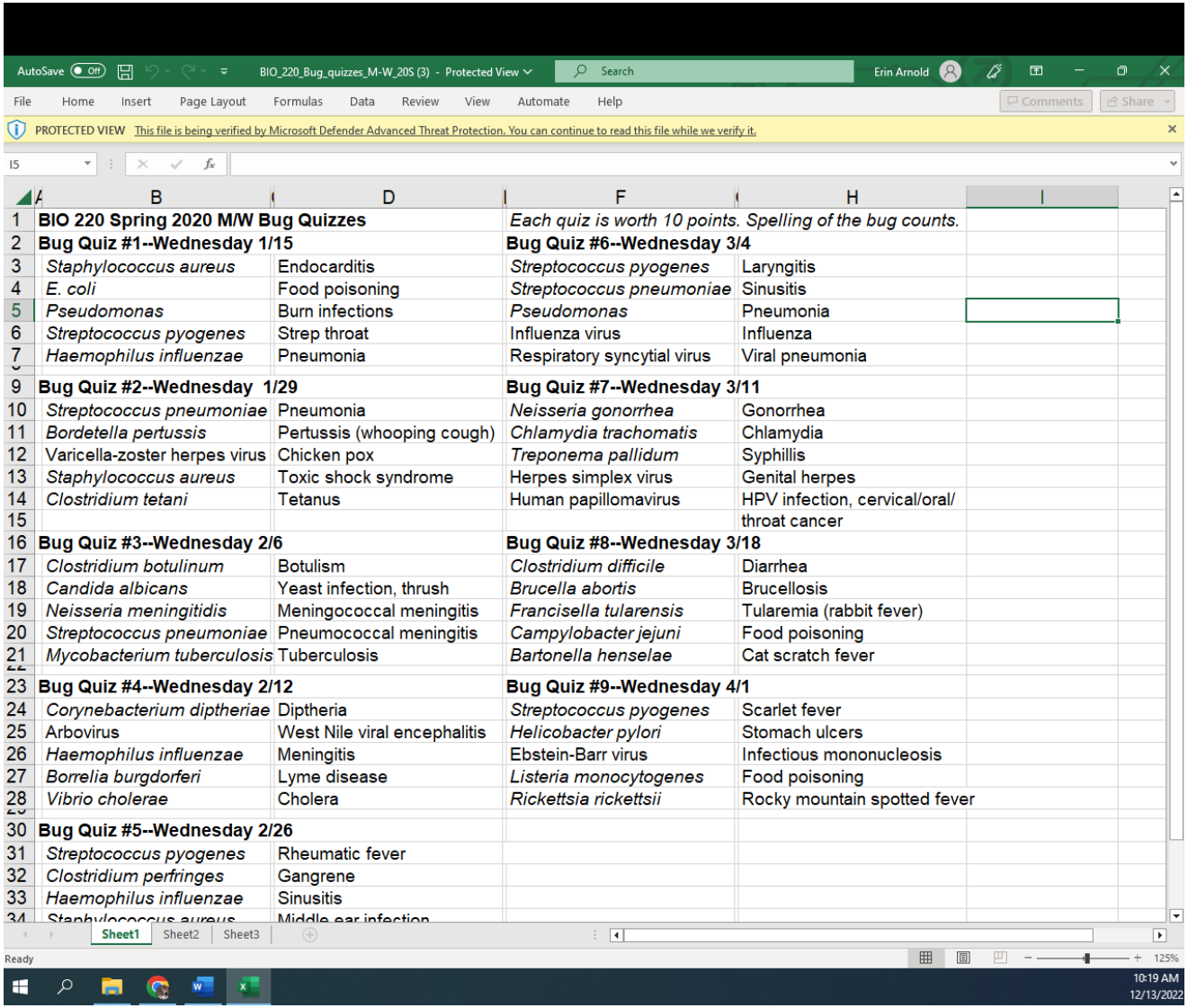
SLO 2 Evidence:

Example of the Connect Pre-lab assignment



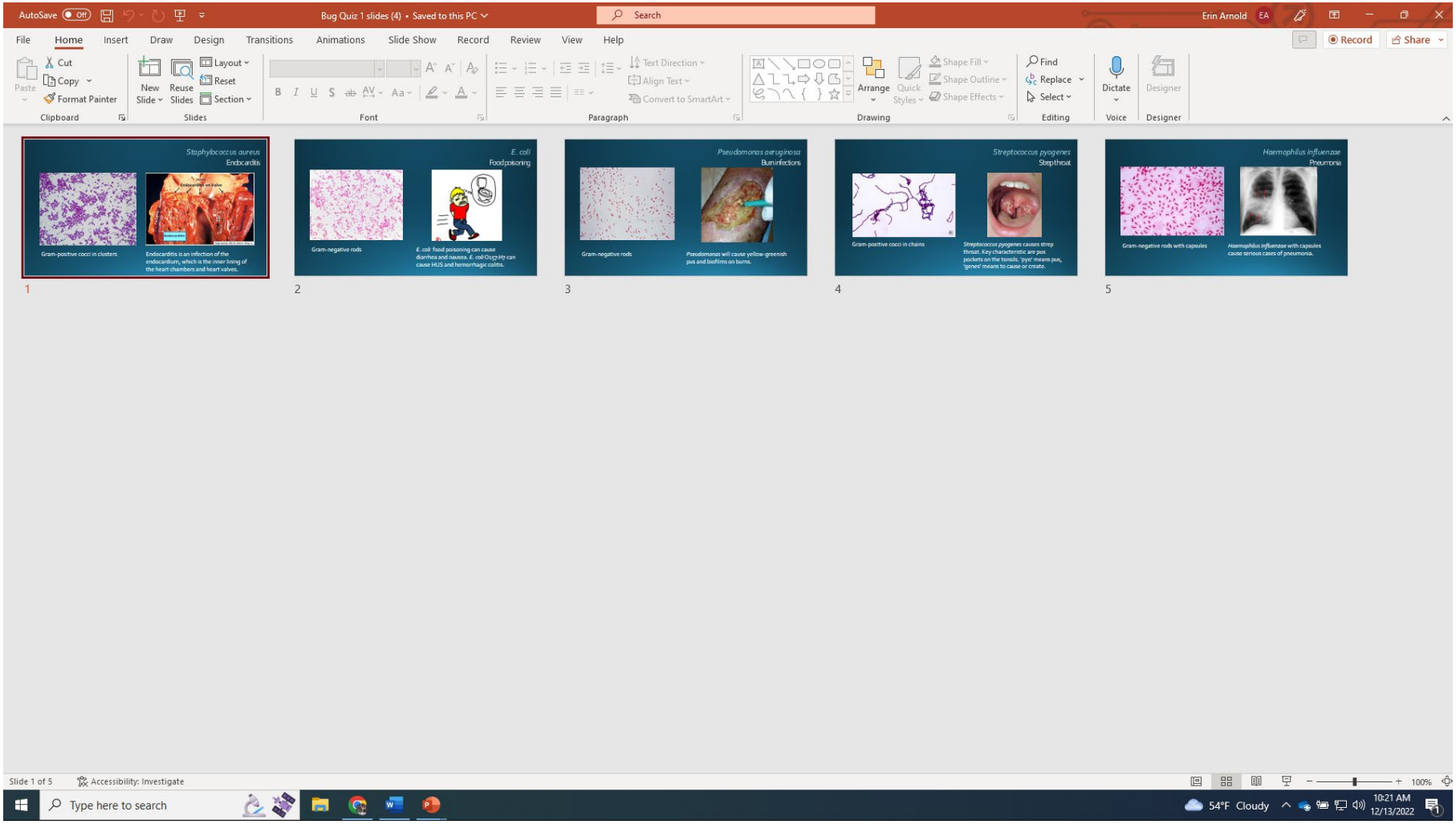
SLO 3 Evidence:

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

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



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.