

COURSE SLO ASSESSMENT REPORT, SCC

Department: Biology Course: Biology 211 Cellular & Molecular Biology

Year: 2011 Semester: Spring

1) Outcome assessed	2) Means and criteria of assessment	3) Summary of data collected			4) Analysis of data	5) Plan of action/what to do next
Express a coherent understanding of fundamental biological concepts that include cell structure, energy, cell reproduction, and genetics.	A series of questions will be embedded in the final exam. The questions are ranked according to degree of difficulty with the expectation that the 10% of the students will correctly answer the “A” question (reflecting the typical “A” student), 20% will answer the “B” question correctly, and 68% will answer the “C” question correctly.	<p align="center">Cell Reproduction A question</p>	<p>How do cells at the completion of meiosis compare with the cell from which they were derived? a) they have twice the amount of cytoplasm and half the amount of DNA b) they have half the number of chromosomes and half the amount of DNA c) they have the same number of chromosomes and half the amount of DNA d)they have the same number of chromosomes and the same amount of DNA e) they have half the a-mount of cytoplasm and twice the amount of DNA</p>	<p align="center">Total # Responses 39 # correct responses 30 % correct responses 77%</p>	The results all were higher than the minimum assessment expectations. While student outcome indicates a higher success rate with question A than question B, the overall success rate for question C was 90%.	Greater emphasis needs to be placed on non-disjunction events and the outcomes of said events.
		<p align="center">B question</p>	<p>If nondisjunction occurs in meiosis II during gametogenesis, what will be the result at the completion of meiosis? a) all the gametes will be diploid b) half of the gametes would have an extra chromosome and half would be missing a chromosome c) 1/4 of the gametes would have an extra chromosome, 1/4 missing a chromosome, and half would be euploid d) there would be three extra gametes e) two of the four gametes will be haploid, and two will be diploid</p>	<p align="center">Total # responses 39 # correct responses 20 % correct responses 51%</p>		
		<p align="center">C question</p>	<p>The beginning formation of a cell plate across the middle of a cell while nuclei reform at opposite ends is characteristic of: a) an animal cell in metaphase b) a plant cell in metaphase c) an animal cell undergoing cytokinesis d) an animal cell in telophase e) a plant cell undergoing cytokinesis</p>	<p align="center">Total # responses 39 # correct responses 35 % correct responses 90%</p>		

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Express a coherent understanding of fundamental biological concepts that include cell structure, energy, cell reproduction, and genetics.	A series of questions will be embedded in the final exam. The questions are ranked according to degree of difficulty with the expectation that the 10% of the students will correctly answer the “A” question (reflecting the typical “A” student), 20% will answer the “B” question correctly, and 68% will answer the “C” question correctly.	<p>Cell Structure A question</p>	<p>The cell walls of bacteria, fungi, and plant cells and the extracellular matrix of animal cells are all external to the plasma membrane. Which of the following is NOT a characteristic of ALL of these extracellular structures? a) they must be highly permeable to water and small molecules in order to allow cells to exchange matter and energy with their environment b) they must permit information transfer between the cell’s external environment and the cytoplasm c) they must provide a rigid structure that maintains an appropriate ratio of cell surface area to volume d) they are constructed of materials that are largely synthesized in the cytoplasm and then transported out of the cell e) they are composed of a mixture of proteins and carbohydrates</p>	<p>Total # responses 57 # correct responses 17 % correct responses 30%</p>	The SLO results all indicate a higher success rate relative to the assessment criteria.	Continue to assess this SLO.
<p>B question</p>	<p>Which of the following is NOT a known function of the cytoskeleton? a) to maintain a critical limit on cell size b) to provide mechanical support to the cell c) to maintain the characteristic shape of the cell d) to hold mitochondria and other organelles in place within the cytosol e) to assist in cell motility by interacting with specialized motor proteins</p>	<p>Total # responses 57 # correct responses 35 % correct responses 61%</p>				
<p>C question</p>	<p>All of the following are part of a prokaryotic cell EXCEPT: a) chromosome b) cell wall c) plasma membrane d) ribosomes e) mitochondria</p>	<p>Total # responses 57 # correct responses 48 % correct responses 84%</p>				

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Express a coherent understanding of fundamental biological concepts that include cell structure, energy, cell reproduction, and genetics.	A series of questions will be embedded in the final exam. The questions are ranked according to degree of difficulty with the expectation that the 10% of the students will correctly answer the “A” question (reflecting the typical “A” student), 20% will answer the “B” question correctly, and 68% will answer the “C” question correctly.	<p>Energy A question</p>	<p>Why is glycolysis considered to be one of the first metabolic pathways to have evolved? A) It produces much less ATP than does oxidative phosphorylation. B) It is found in the cytosol, does not involve oxygen, and is present in most organisms. C) It is found in prokaryotic cells but not in eukaryotic cells. D) It relies on chemiosmosis which is a metabolic mechanism present only in the first cells-prokaryotic cells. E) It requires the presence of membrane-enclosed cell organelles found only in eukaryotic cells.</p>	<p>Total # responses 57 # correct responses 45 % correct responses 79%</p>	<p>The SLO results all indicate a higher success rate relative to the assessment criteria. Question B was missed more frequently than A and is more analytical. Perhaps question B should actually be the A question as in retrospect it does seem more difficult.</p>	Continue to assess this SLO.
		<p>B question</p>	<p>Which of the following is a true distinction between fermentation and cellular respiration? a) only respiration oxidizes glucose b) NADH is oxidized by the electron transport chain only in respiration c) fermentation, but not respiration, is an example of an anabolic pathway d) substrate-level phosphorylation is unique to fermentation e) NAD⁺ functions as an oxidizing agent only in respiration</p>	<p>Total # Responses 57 # correct responses 37 % correct responses 65%</p>		
		<p>C question</p>	<p>The ATP made during glycolysis is generated by A) substrate-level phosphorylation. B) electron transport. C) photophosphorylation. D) chemiosmosis. E) oxidation of NADH to NAD⁺.</p>	<p>Total # responses 57 # correct responses 49 % correct responses 86%</p>		

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Express a coherent understanding of fundamental biological concepts that include cell structure, energy, cell reproduction, and genetics.	A series of questions will be embedded in the final exam. The questions are ranked according to degree of difficulty with the expectation that the 10% of the students will correctly answer the “A” question (reflecting the typical “A” student), 20% will answer the “B” question correctly, and 68% will answer the “C” question correctly.	<p>Genetics A question</p>	<p>A man who is an achondroplastic dwarf with normal vision marries a color-blind woman of normal height. The man's father was six feet tall, and both the woman's parents were of average height. Achondroplastic dwarfism is autosomal dominant, and red-green color blindness is X-linked recessive. How many of their daughters might be expected to be color-blind dwarfs? A) 100% B) 0% C) 50% D) 25% E) 75%</p>	<p>Total # responses 39 # correct responses 25 % correct responses 64%</p>	The results all were higher than the minimum assessment expectations. While student outcome indicates a slightly higher success rate with question A than question B, the overall success rate for question C was 97.4%.	Continue to assess this student learning outcomes in genetics.
		<p>B question</p>	<p>In cats, black fur color is caused by an X-linked allele; the other allele at this locus causes orange color. The heterozygote is tortoiseshell. What kinds of offspring would you expect from the cross of a black female and an orange male? A) Tortoiseshell females; tortoiseshell males B) Black females; orange males C) Orange females; orange males D) Tortoiseshell females; black males E) Orange females; black males</p>	<p>Total # responses 39 # correct responses 24 % correct responses 61.5%</p>		
		<p>C question</p>	<p>All of the offspring of a cross between a black-eyed alien and an orange-eyed alien have black eyes. This means that orange eyes are _____ to black eyes. a) co-dominant b) recessive c) better than d) dominant e) incompletely dominant</p>	<p>Total # responses 39 # correct responses 38 % correct responses 97.4%</p>		

COURSE SLO ASSESSMENT REPORT, SCC

Department: Biology

Course: Biology 211 Cellular and Molecular Biology

Year: 2011

Semester: Spring

1) Outcome to be assessed	2) Means of assessment and criteria of success	3) Summary of data collected	4) Analysis of data	5) Plan of action/what to do next
<p>Employ the principles of the scientific method to investigate situations.</p>	<p>An investigative problem was included on the first exam. Students were asked to identify the appropriate information in the problem for each element of the scientific method listed (observation, question, hypothesis, prediction, experiment, conclusion, and how the conclusion related to the hypothesis. Each element was scored using a rubric with a total of 8 possible points for all answers. The hypothesis element had a possible 2 point value with one point being awarded for a response that was close to being correct. It was expected that the average student would earn 5 out of the 8 points.</p>	<p>A total of 64 students took the exam. Observation: 39 correct responses (61%). Question: 20 correct responses (31%). Hypothesis: 42 students received full credit (66%), 2 students received partial credit (5%). Of the possible 128 points, 86 points were awarded (67%). Prediction: 47 correct responses (73%). Experiment: 60 correct responses (94%). Conclusion: 60 correct responses (94%). How the conclusion related to the hypothesis: 34 correct responses (53%). Of the 512 points possible for the 64 students, 346 were awarded (68%), average # points per student = 5.4. A total of twenty students had correct answers for all parts = 31% of the class.</p>	<p>Students had difficulty in correctly identifying an appropriate question based on the information given. The ability of students to formulate a question based on the observation and relate their conclusion to the hypothesis also appears to be challenging. Students were very successful in identifying what the experiment was and the conclusion. Student success for this SLO was greatly improved over the previous semester. The class as a whole earned 68% of the points (equivalent to a "C" grade in this class) relative to 45% the last time the class was taught by this instructor (23% improvement) and averaged 5.4 points per student relative to 3.6 points last year. This moves the success of this SLO into the range than was expected for student success.</p>	<p>Continue to assess this SLO to ensure than we are providing the proper instruction for student success.</p>