Assessment: Assessment Unit Four Column

Spring/Summer 2018

El Camino: PLOs (NSC) - Environmental Horticulture

PLOs	*Assessment Method Description*	*Results*	*Actions*
PLO #1 Planning with Given Materials - Upon completion of their study of course materials for the Environmental Horticulture Program, the successful student will be able to accurately identify a set of plant material; use that plant material in a landscape design; and prepare a maintenance schedule for the chosen plant materials. **PLO Status:** Active **PLO Assessment Cycle:** 2017-18 (Spring 2018) **Input Date:** 11/12/2013 **Comments:** Per Russell Serr's 11.08.2016 e-mail; program may be discontinued.			

Assessment: Assessment Unit Four Column

Spring/Summer 2018

El Camino: PLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology)

PLOs	*Assessment Method Description*	*Results*	*Actions*
PLO #3 Application of Health Science Concepts - Students will be able to apply concepts learned to healthy and pathological outcomes. **PLO Status:** Active **PLO Assessment Cycle:** 2013-14 (Spring 2014), 2017-18 (Spring 2018) **Input Date:** 11/12/2013	**Exam/Test/Quiz -** Multiple choice questions were incorporated into exams or quizzes to assess student understanding of cellular structure and function. **Standard and Rubric:** The rubric for the Cell Structure and Function PLO Assessment was: Level 0 Student answered all three questions about cell structure and transport incorrectly. Level 1 Student can answer one question about cell structure and transport. Level 2 Student can answer two questions about cell structure and transport. Level 3 Student can answer all three questions about cell structure and transport. **Additional Comments:** It is expected that 65% of students will score at	**Semester of Current Assessment:** 2017-18 (Spring 2018) **Standard Met:** Standard Not Met The questions used to assess student understanding included the following: 1. Red blood cells are observed under a microscope, then a 20% saline solution is added to them. Which of the following would you expect to see? A) The cells would swell up and lyse B) The cells would crenate (shrink) C) The cells would look the same as before the saline solution was added D) The cells would turn inside out E) The cells would dance the Macarena 2. In Tay-Sachs disease, glycolipids build up in nerve cells and cause neuronal death because the organelle that normally degrades the glycolipids is nonfunctional. Which one of the following 5 organelles is responsible for this disease? A) Mitochondrion B) Smooth Endoplasmic Reticulum C) Ribosomes D) Lysosomes E) Golgi Apparatus 3. The phospholipids of a cellular membrane will	**Action:** More emphasis needs to be made in terms of the effects of osmosis on cells, cellular organelle functions, and plasma membrane structure and function. Review the topics prior to exams. A cell membrane worksheet has been developed to assist students to understand the properties and functions of the plasma membrane of cells. (03/31/2019) **Action Category:** Teaching Strategies **Action:** More funding for outside and in-class tutoring assistance will be requested from the college. (03/31/2018) **Action Category:** Program/College Support **Follow-Up:** The following worksheet was used in the Allied Health Sciences Program classes to aid student understanding of the nature of a cell's plasma membrane and how materials move across it: Properties of a Cell Plasma

PLOs	Assessment Method Description	Results	Actions
	level 2 or higher on this PLO. For each of the individual questions asked, it is expected that 65% or greater of students assessed should answer the questions correctly.	have their ____ends facing each other and their _____ ends facing either the intracellular or extracellular space. A) hypotonic; hypertonic B) hypertonic; hypotonic C) hydrophilic; hydrophobic D) hydrophobic; hydrophilic E) hypotonic; hydrophobic RESULTS Assessment Data & Analysis: What are the results of your assessment? Provide the assessment data. Summarize the patterns observed in the data. What were the most important findings from the data? Enter text here. Overall, the average percent of students in the Allied Health Sciences Program who answered two or more questions correctly was about 64%, which did not quite meet the rubric target of 65% of students. However, some courses in the Program met or exceeded the target, whereas other courses fell short of the target. Courses that met or exceeded the target included Anatomy 32, with 69.2% of students meeting the target, Physiology 31, with 80.7% of students who met the target. It makes sense that the Physiology 31 students would have more students who exceeded the target goal because the students in that course have had to pass the prerequisites of Chemistry and Anatomy 32 to enter the course. Courses that did not meet the target included Anatomy 30, with 62.2% of student who met the target; Microbiology 33, with 57.5% of students who answered two or more questions correctly; Anatomy & Physiology 34A, with 55.5% of students on target; and Anatomy and Physiology 34b, with 58.3% of students meeting the target. It is puzzling as to why Anatomy and Physiology 34A and 34B students had sub-par scores because they both require prerequisites that should have prepared the students for the rigorous material, and they include the same material as the other Anatomy and Physiology courses. Surprisingly, the Anatomy 30 classes averaged a slightly higher percentage (62.2%) that that of the A & P 34A and 34B classes, despite the fact that	Membrane Phospholipid Bilayer Worksheet Diagram Key: ? = Phosphate head II = Fatty acid tails ECF = Extracellular fluid ICF = Intracellular fluid ECF ?????????????????????????????? ???????????? II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II II ?????????????????????????????? ???????????? ICF of a Red Blood Cell = 0.9% NaCl Use the following selections to answer questions 1-2. (Two answers for each question.) A. Polar B. Hydrophobic C. Nonpolar D. Hydrophilic 1. In the diagram of a cell membrane phospholipid bilayer above, the phosphates position themselves near the aqueous ECF and ICF because they are _____ and _____ 2. The fatty acid tails align themselves in the interior of the membrane because they are _____ and _____. 3. Which of the following substances can diffuse across the membrane? (Use all that apply.)

PLOs	Assessment Method Description	Results	Actions
		Anatomy 30 is an entry level course that has no prerequisites to enter the course. However, Anatomy 32, which is a higher level entry course than Anatomy 30, did have a greater percentage (69.2%) of students who achieved the target level. An examination of the methods whereby the questions' topics are taught in Anatomy 32 and Physiology 31 compared to those used in Anatomy 30, as well as A & P 34A and 34B could help to improve the scores in those classes. Microbiology 33 students also scored lower (57.5%) than the target level, which is another quandary because those students have successfully completed Anatomy 32 or A & P 34A and 34B, and often Physio. 31 prior to their entry into Microbiology. In terms of the overall percent of correct student answers to the individual questions, question #2 had the greatest percent of correct answers, at 61.7%, followed by question #3, at 59.8%, followed by question #1, at 56.2%. All of these fell short of the desired 65%. Question #1 was: 1. Red blood cells are observed under a microscope, then a 20% saline solution is added to them. Which of the following Would you expect to see? A) The cells would swell up and lyse B) The cells would crenate (shrink) C) The cells would look the same as before the saline solution was added D) The cells would turn inside out E) The cells would dance the Macarena Correct Answer: B	A. Water B. Ions C. Oxygen D. Carbon dioxide E. Proteins Use the following selections to answer questions 4-6. A. Water would diffuse into the cell, causing it to expand and lyse. B. Water would diffuse out of the cell, causing it to crenate (shrink). C. There would be no net diffusion of water – the cell would remain the same size. D. The cell is in a hypertonic solution. E. The cell is in a hypotonic solution. 4. If a red blood cell, with 0.9% NaCl in its ICF, were placed in a 10% NaCl solution, which of the above would happen to the cell? _____ Why? _____ 5. If a red blood cell were placed in distilled water, which of the above would happen to the cell? _____ Why? _____ 6. If a red blood cell was placed in a 0.9% saline solution, what would happen to the cell?_____ Once the students from each of our courses submitted their answers to the above questions, it was found that the majority of students understood the concepts from questions 1, 2, 4, 5, and 6 above. However, a relatively large

PLOs	Assessment Method Description	Results	Actions
		The correct answer of “B” was answered by the majority of students (56.2%), but 30.8% of the students chose answer “A,” which is the complete opposite of the correct answer. This seems to indicate that good percentage of students do not understand the basic concept of osmosis in cells, despite multiple techniques employed to teach the concept. Question #2 was: 2. In Tay-Sachs disease, glycolipids build up in nerve cells and cause neuronal death because the organelle that normally Degrades glycolipids is nonfunctional. Which one of the following 5 organelles is responsible for this disease? A) Mitochondrion B) Smooth Endoplasmic Reticulum C) Ribosomes D) Lysosomes E) Golgi Apparatus Correct Answer: D The correct answer of “D” was answered by the majority of students (61.7%), which almost met the target level of 65%. 16.6% of students answered “B,” which indicates that some students are uncertain about the difference in the functions	percentage of students answered question 3 incorrectly. There seemed to be a general misunderstanding about which types of molecules can diffuse across a cell membrane, versus which must be transported via channels or carrier proteins. Our faculty concluded that we need to be more clear about this topic in future lectures. (06/13/2019)

PLOs	Assessment Method Description	Results	Actions

of the two cellular organelles.
Question #3 was:
2. The phospholipids of a cellular membrane will have their ____ends facing each other and their _____ ends facing
either the intracellular or extracellular space.
A) hypotonic; hypertonic

B) hypertonic; hypotonic

C) hydrophilic; hydrophobic

D) hydrophobic; hydrophilic

E) hypotonic; hydrophobic

Correct Answer: D

The correct answer “D” was selected by the majority of students (59.8%), which indicates that most of the students understand the arrangement of phospholipids the plasma membrane. The second most frequent answer (25%) was letter “C,” which is the exact opposite of the correct answer. This illustrates that one quarter of the students were able to distinguish between the terms hypotonic vs. hydrophilic and hypertonic vs. hydrophobic, but still have a misconception about which direction the hydrophilic and hydrophobic regions of cell membranes are located.

(09/08/2018)
Faculty Assessment Leader: M. Steinberg and T. Noyes
Faculty Contributing to Assessment: T. Bui, M. Mubarak, J.

PLOs	Assessment Method Description	Results	Actions
		Padilla, P. Parks, M. Steinberg, M. Stupy, A. Valle **Courses Associated with PLO Assessment:** Anatomy 30, Anatomy 32, Anatomy & Physiology 34A, Anatomy & Physiology 34B, Physiology 31, and Microbiology 33 **Related Documents:** CellSLOReport2018.doc	