Anatomy and Physiology 103A & 103B

SLOAC PRESENTATION
SLO #4: Biology 103A

• Demonstrate skills in the use of biological instrumentation: microscopy, equipment capable of measuring action potentials and muscle physiology and anatomical dissection (including dissection of preserved animals and cadavers)

• Focus: Understanding the proper way to adjust a light microscope to examine stained histology slides.
SLO #4: Biology 103A

• **Significance:** Students in 103A will utilize the microscope throughout the entire two semester sequence to examine tissues and organs of the body. This skill is critical to accomplish SLO #1: Recognize and describe structure and function relationships at the cellular, tissue and organ levels.

• **General significance:** Gaining a key skill in the study of biology
SLO #4: Biology 103A

- **Teaching methods:** initially (prior to Fall 2012) I both lectured and demonstrated the following key skills. Since microscope skills are taught in the pre-requisite course, I assumed this was a review for the majority of the students.
  
  - *Functions of the parts of the microscope*
  
  - *Setting up critical illumination*
  
  - *Describing the relationships between magnification, field of view and depth of field*
SLO #4: Biology 103A

- **Assessment:** Practical examination questions and quiz questions tested each of the three microscope related knowledge and skill questions.
  - A microscope was employed in practical exams to test student knowledge about how it was set up or what were the functions of individual parts. In Fall 2012: test questions excluded critical illumination skills.
  - Fall 2012: initial assessment of critical illumination skills was casual. Estimates were made of the percentage of students whose microscopes were not properly set up when that student asked for help in examining a slide.
SLO #4:  Biology 103A

• Results:
  – **Fall 2012:** An average score of 2.7 and 2.3 out of 3 possible points (90% & 77%, respectively) for student’s knowledge of the functions of the parts of the microscope and the relationship between magnification and depth of field.
  – Casual assessment of properly setting up critical illumination was poor, however. I estimated only about 40% of students were able to properly set up their microscope.
SLO #4: Biology 103A

• Adjustments to teaching based on fall 2012 assessment:
  – *In Spring 2013 & Fall 2013 I had the students obtain their microscope and perform the proper adjustments during the lab lecture on the microscope rather than after I finished and demonstrated these skills.*
  – *When a student asked for help with a slide and their microscope was adjusted incorrectly I showed them how to adjust it individually.*
  – *I continued to assess knowledge on the functions of the parts and one relationships, but added practical test questions on properly setting up critical illumination*
SLO #4: Biology 103A

• Results of 2013 adjustments:
  – Students continued to test well in their knowledge of the functions of the microscope and the relationships of magnification, etc. (63%* and 81% ) respectively
  – 58% successfully identified the part that was improperly set up for critical illumination in a practical exam.
  – * the drop in the success rate for this had to due with including questions on the care and cleaning of microscopes in this section.
SLO #4: Biology 103A

- **Adjustments to teaching in 2014:** Earlier adjustments to teaching the use of the microscope were continued.

- When students asked for help with their microscope **rather than correcting improperly set up microscope for them**, I let them know it was improper then **asked them to adjust it**. If they did not know how to do that, I individually instructed them.
SLO #4: Biology 103A

- **Preliminary Spring 2014 Results:**
  - The following is based on a single practical exam question. This question required student’s to evaluate an improperly set up microscope and determine what needed to be adjusted.
  - 62% were able to identify the part of the microscope that needed adjusting.
  - This represents only a slight improvement over the 2013 results. (58% → 62%)
SLO #4: Biology 103A

• Conclusions:
  – Theoretical knowledge of the functions of the parts of the microscope was good.
  – Students **struggled to apply** this knowledge when asked to set up a microscope properly for critical illumination.
  – **Individual instruction** increased the percentage of students that were able to apply their knowledge.
  – Allowing student to **correct their own mistakes** further increased their ability to apply their knowledge
Anatomy and Physiology 103B

SLOAC Presentation
SLO #2&3: A &P 103B

• #2: Interpret physiological homeostatic mechanisms and their interactions in multiple body systems.

• #3: Relate normal homeostatic mechanisms to abnormal conditions observed in human pathologies.
SLO #2&3: A &P 103B

- **Use of Capstone project**: Biology 103A and B are utilized as a pre-requisite by a variety of health science related programs (nursing, PTA, RT, pre-pharmacy, etc.)
- The majority of students are interested in careers in the health sciences.
- These careers require students to apply their knowledge of normal physiological parameters and mechanisms to pathological situations.
SLO #2&3: A &P 103B

• Assessments:
  – *Test questions, practical examinations and quizzes* included questions that tested a student’s knowledge of normal and abnormal physiological parameters and mechanisms
  – Analysis of pathological conditions were included in *lectures as discussion points*
  – A *capstone take home exam case study* was given as part of the final exam. 4-5 students had that same case study but each student wrote a unique paper based on this case study. The case study described an individual patient’s condition and 4-5 specific questions were required to be answered in a 2 page paper.
SLO #2&3: A &P 103B

• Case study rubric:

• **Zero**: unable to *identify the normal* underlying principles or parameters affected in the patient.

• **1**: correctly *identified abnormal* or altered physiological mechanisms or parameters in the patient

• **2**: correctly *analyzed* how that physiological principle or parameter was abnormal in this context.

• **3**: correctly analyzed *how* the pathology has altered those parameters or principles and showed an ability to *integrate* that understanding with the pathology’s signs or symptoms.
SLO #2&3: A &P 103B

• Results:
  – Score of 0: no students earned this score
  – Score of 1: no students earned this score
  – Scores of 2-3: scores ranged from 2.2-3

  – Average score: 2.7/3 Thus 90% of students were able to analyze and apply their physiological knowledge to abnormal pathological situation.