DeAnza College **SLO ARCHIVE**

Student Learning Outcomes for PHYS 4A

Physics for Scientists and Engineers: Mechanics

Team Members:

Team Leader:
Eduardo Luna () in PHYS

Other members:

1. David Newton (x8668) PHYS

Additional team members/notes about team:

Ron Francis

Additional Notes:

Outcomes:

Outcome 1 Phase I: Statement

Critically examine new, previously un-encountered problems, analyzing and evaluating their constituent parts, to construct and explain a logical solution utilizing, and based upon, the fundamental laws of mechanics.

Outcome 1 Phase II: Assessment Strategy Used:

Assessment Quarter: Winter 2011
Assessors: David Newton
Assessment Tools: *No tools assigned*.
Sections being assessed: 01, 02, 03

Outcome 1 Phase III: Reflect & Enhance

Number of people involved in Phase III: 1

Changes:

Methods:
As assessment tools we used selective new un-encountered problems on the lecture final. Assessment was then based on the scores obtained on these selective problems on an

individual and overall class basis. The following problem on the lecture final was used as an assessment:Two equal masses each of a given mass 'm' connected together by a string of length 'L' both as a system are in free-fall radially inwards towards a planet of mass 'M'. Calculate the tension force in the string.

Findings and Conclusions:
a) 15% of the class was able to solve the problem correctly, 50% did acceptably well, and 35% did not perform well.b) 35% of the class needed to improve their analytical and problem solving skills.c)65% success was acceptable for the class, but not outstanding.d)Areas for improvement would be to further help students develop their analytical and problem solving skills using the principles/laws/theories of classical mechanics.e) The results are typical in this type of class and reasonably acceptable considering the size of the class.

Enhancement (Planned Actions)
Part I:
The assessment results suggested areas of student learning improvement. In order to improve student learning and success, the instructor should address the SLOs and the assessment results in an effective pedagogical approach.

Part II:
Supplementing our teaching methods with computer-based technology and traditional physics demonstrations would be ideal to help students understand physics principles from a conceptual and practical viewpoint.

Outcome 2 Phase I: Statement

Gain confidence in taking precise and accurate scientific measurements, with their uncertainties, and then with calculations from them, analyze their meaning as relative, in an experimental context, to the verification and support of physics theories.

Outcome 2 Phase II: Assessment Strategy Used:

Assessment Quarter: Winter 2011
Assessors: David Newton
Assessment Tools: •
Sections being assessed: 01, 02, 03

Outcome 2 Phase III: Reflect & Enhance

Number of people involved in Phase III: 1

Changes:

Methods:
Proper knowledge of the Scientific Lab Report as accessed in the lab final including; scientific measurements with uncertainties, error analysis, calculations, and hands-on experience with the experimental method. The following problem was used as an assessment on error analysis in the lab:Using the methods of uncertainty propagation, find

the algebraic (no numbers) value for the absolute uncertainty in the following quantity Z defined as follows:Z = X / (X+Y)^2Assume the absolute uncertainties in X and Y are given.

Findings and Conclusions:
a) About 30% of the class was able to solve the problem correctly, 30% did acceptably well, and 40% did not know how to solve it.b) 60% success was partially acceptable for the class and thus there weren't any apparent student needs and issues revealed.c)80% success on error analysis was acceptable for the class, but not outstanding.d)Area for improvement would be to further help students develop a conceptual and practical understanding of the physics principles in the lab.e)Based on previous performances for such a class, the results are reasonably acceptable.

Enhancement (Planned Actions)
Part I:
The assessment results suggested areas of student learning improvement. In order to improve student learning and success, the instructor should address the SLOs and the assessment results in an effective pedagogical approach.

Part II:
Supplementing our teaching methods with computer-based technology and traditional physics demonstrations would be ideal to help students understand physics principles from a conceptual and practical viewpoint.

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