## Master Syllabus Department of Physics and Astronomy



# PHYC 141: General Physics 1 Laboratory

#### **Course Description**

General Physics 1 (Calculus based) Lab. The laboratory component to accompany PHYC 140. Computer simulations and in-lab experiments are performed. (1 credit hour)

Prerequisite or parallel: PHYC 140.

Not open to students who have credit in PHYC 120.

#### **Course Objectives**

This course represents the laboratory component that traditionally accompanies the general physics courses. In contrast with PHYC 120 in which the laboratory component is integrated within the single course, PHYC 141 (together with the companion course PHYC 140) decouples the laboratory from the content part of the course. By so doing, additional scheduling flexibility is provided to the student. Also, the combination of PHYC 140 and PHYC 141 is designed to facilitate the use of self-paced individualized learning environments through the extensive use of computer technology. The objectives for this approach remain the same as the traditional laboratory setting - to have the student learn how laboratory work and measurement play key roles in the development and verification of physical laws and theories.

#### **Course Rationale**

This laboratory course is part of the PHYC140/PHYC141 combination that will enable students to satisfy the general physics lecture/lab course requirements that is currently being satisfied by PHYC 120. PHYC 141 will incorporate a combination of computer-based simulation experiments, data taking using materials delivered to the student, and actual on-campus laboratory activities.

#### Course Content, Format, and Bibliography

#### Content

Experiments to be performed will be selected from the following illustrative list. One laboratory exercise will be accomplished for each major topic in the content part of the course. An important component of this laboratory will be the use of computer simulations for mechanics experiments.

Uniformly Accelerated Motion on the Air Table Kinematics in Two Dimensions on the Air Table Force Table and Vector Addition of Forces Newton's Second Law on the Air Table Conservation of Energy on the Air Table Centripetal Acceleration of an Object in Circular Motion

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The Ballistic Pendulum and Projectile Motion Conservation of Momentum on the Air Table Torques and Rotational Equilibrium of a Rigid Body Moment of Inertia and Rotational Motion Simple Harmonic Motion Standing Waves on a String

### Format

Methods of evaluating student performance: Course grades will be based on the student's performance on two exams (midterm and final) and laboratory reports submitted for each of the lab exercises. The lab reports will typically be prepared in a formal fashion using word processor and spreadsheet tools. Exams will, in part, be laboratory based.

## Bibliography

Textbook: Laboratory Manual by CENGAGE Learning

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