

Physics 118 – Introductory College Physics (4)
Course Outline GE B3

Prerequisites for Phys 118: MATH 118 and high school trigonometry, or MATH 119.
Primarily for students in kinesiology. Not open to students with credit for PHYS 121 or PHYS 141.
4 Lectures

Learning Objectives and Criteria:

Upon completion of the course the student is expected to know:

- a. That the physical world can be understood in terms of laws of nature.
- b. That the laws of nature are written in the language of mathematics.
- c. How to use vectors to understand motion.
- d. How to draw free-body diagrams and use Newton's laws of motion to understand forces and motion, especially within the context of human movement.
- e. How to apply the laws of conservation of energy and conservation of momentum.
- f. How energy and heat are transferred and transformed, especially within the context of human movement and metabolism.
- g. How to solve problems in an organized and systematic way.

Physics 118 will introduce students to the basic laws of mechanics and energy. Where possible, applications will emphasize how physics is relevant to human motion and metabolism. A substantial part of the course will be devoted to showing students how to solve problems in a structured and organized way. The course provides the necessary preparation for students to go on to further studies in biomechanics and exercise physiology or to continue with PHYS 122/123.

Text and References:

Knight, Jones, Field, College Physics, Vol. 1, 1st Edition, Pearson Addison Wesley.

Content and Method:

Method: Physics 118 is a traditional lecture course (4 Lectures). There are occasional demonstrations.

Examinations and quizzes require the student to explain how he/she obtained the answer and thus to describe the reasoning, not just solve equations. Typically this written portion will constitute one-third to one-half of the credit given. A variety of multiple choice (70-80%) and short answer formats (20-30%) have been used. Exams are a balanced mix of conceptual questions and quantitative problems. Different faculty may give somewhat different weights to the different aspects of assessment, but the variation among faculty is small. Learning depends on discussion of homework, quizzes based on homework, and examinations of the principles discussed in class.

Formative assessment of objectives c, d, e, and f will be through in-class “concept questions,” assigned homework, and periodic quizzes. Summative assessment of all objectives will be through two midterm exams and a final exam, all of which will include short-answer questions as well as quantitative problems.

Content: Physics 118 will adhere to the following topics:

- Week 1: Basic concepts of motion; vectors.
- Week 2: Motion in one and two dimensions.
- Week 3: Force and Newton’s laws of motion.
- Week 4: Using Newton’s laws; applications to human motion.
- Week 5: Circular and rotational motion.
- Week 6: Statics and elasticity; fluids and buoyancy.
- Week 7: Linear and angular momentum.
- Week 8: Energy and work.
- Week 9: Using energy; applications to human motion.
- Week 10: Heat and temperature; laws of thermodynamics.