50:750:131 – Elements of Physics I

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Office	CNS 216C	**Final Exam**	TBA

Class meeting time:

Text: "**Fundamentals of Physics**, "David Halliday, Robert Resnick, Jearl Walker" Vol. 1 – **10th** Edition.

ISBN : 978-0470469088, *Hardcover*, contains both Vol. 1 & 2

ISBN : 978-0470564738, *Binder version*, contains both Vol. 1 & 2 (best value)

You are welcome to purchase older versions of this text, but please be aware that I will be assigning readings and homework problems based on the 10th edition. If you choose to use an older or newer edition, you will be responsible for cross-referencing assigned chapter readings and homework problems.

Description:

This course is the first part of the Elements of Physics tandem, which are calculus-based physics courses taught mostly to Engineering, Physics, and Chemistry majors. You will be expected to use algebra, calculus, geometry, and trigonometry in order to solve physical problems pertaining to realistic systems. See the end of this document for a tentative outline.

During the course of this semester, you will become familiar with the principles of physics that determine the motion of objects e.g. Newton's laws and conservation of energy. You will also be introduced to the practice of using mathematics to describe physical phenomena and using it as a tool to make predictions. The goal for this course is to provide the student with a working knowledge of Newtonian physics.

Co-requisite: 50:750:133 Laboratory. The grade for the laboratory is assigned by the laboratory instructor and is separate from the lecture grade.

Specific Student Learning Outcomes (SLOs) Objectives:

1. Understand the problem-solving process and develop critical thinking skills.
2. Model and solve a variety of problems using trigonometry, algebra, calculus, and geometry.
3. Understand laws of motion and causes.
4. Understand the concepts of work and energy and apply them to solve problems.
5. Understand momentum and its role in collisions.
6. Understand rotational motion and its relationship to translational motion. Correctly define mechanical equilibrium.
7. Gain an introduction to waves and their properties.

Details:

1) I will be available during office hours to provide you will help on the course material and answer any questions you may have. If you need assistance outside of office hours, please email me to schedule a time.
2) ***There are no make-up exams***. If you miss an exam, you must provide a written medical excuse or the equivalent. If the excuse is accepted, you receive the average of the other

three exams that you will have completed. If you miss the final exam, you will need a medical excuse ***and*** must contact the instructor within 48 hours of the final to discuss your options.

3) Homework assignments will be assigned through OpenStax on a weekly basis and will be worth 15% of your total grade. These problems are meant to act as steppingstones toward harder open-ended problems from the textbook.
4) Open-ended homework will be assigned for each chapter but will not be collected nor graded. You are strongly advised to have tried all problems by the due date. I typically review some of the problems in class and you will gain the most benefit from this if you have done the homework problems beforehand. The exams will be based on the homework and the lecture notes.
5) In addition to exams, I reserve the right to administer quizzes that will count towards your final grade. There will be no make-up quizzes. Students missing a lecture quiz will receive a zero for that quiz. The lecture quizzes are intended to assess your study habits and help you stay on track.

Grading:

- 3 Hourly Examinations (3 semester) – total 60% of final grade
- 6 Quizzes – total of 25% of the final grade
- OpenStax Assignments – total of 15% of final grade
- Specific questions regarding exam points are permitted, however, all disputes must be presented within one week of receiving your exam grade. I.e., I will not consider any exam grade changes at the end of the semester.
- A curve may or may not be implemented depending on the class average. Do not count on a curve as it is <u>not</u> guaranteed. If a curve is not applied, letter grades will be assigned based on the following ranges:

A	89.50 - 100%	C	66.50 - 75.49%
B+	86.50 - 89.49%	D	55.50 - 66.49%
B	79.50 - 86.49%	F	<55.49%
C+	75.50 - 79.49%		

*Please note, these numbers already reflect rounding, and no additional rounding will be implemented. Emails requesting additional grade rounding will not be responded to.

This grading rubric is subject to change if the instructor finds a curve or additional assignments necessary to properly assess the students.

Instructor's Statement:

- Do not engage in any form of academic dishonesty. I will report any violations of this policy to the campus Judicial Officer. If you do not know what academic dishonesty is, please consult this statement:
  http://www.camden.rutgers.edu/RUCAM/info/Academic-Integrity-Policy.html.

- Please note that it is necessary to explain all steps that you take when solving problems during an exam – make an effort to ***clearly*** show your work. Answers without justification will not be accepted!

- Do not use cell phones in class or disrupt class in any way. If you do so, you will be asked to leave and will not be welcomed back for the rest of the class period.

- Attending the lecture is not enough. Take notes in class and read the relevant sections in the textbook. In addition, make sure to review all example problems and attempt all the homework problems. The importance of practicing problems cannot be emphasized enough.

Class Resources:

Lecture notes, answer keys, homework solutions, and announcements will all be posted on the course's Canvas.

https://canvas.rutgers.edu/

Tentative Class Outline:

Chapter 1 - Introduction, Review of Math, Coordinate systems, etc.
Chapter 2 - Kinematics
Chapter 3 - Vectors
Chapter 4 - Motion in Two and Three Dimensions
Exam 1 – October 13th

Chapter 5 - Force and Motion I
Chapter 6 - Force and Motion II
Chapter 7 - Kinetic Energy and Work
Chapter 8 - Potential Energy and Conservation of Energy
Exam 2 – November 10th

Chapter 9 - Center of Mass and Linear Momentum
Chapter 10 - Rotation
Chapter 11 - Rolling, Torque, and Angular Momentum
Chapter 10 - Oscillations
Exam 3 – TBA