

Embry-Riddle Aeronautical University Prescott Campus

Course PS160.01 Physics II for Engineers (Summer A 2019)
3 credit hours

Time MTWTh 2:25-3:55 PM **Location** 55B

Instructor Dr. Darrel Smith

Office Hours See the website: <http://physicsx.pr.erau.edu/>

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Course Description

Special theory of relativity; rotational motion; conservation of angular momentum; simple harmonic motion; waves; fluids; kinetic theory; thermodynamics. Prerequisite: PS150 Corequisite: MA242

Goals

This course is an introductory course in college physics designed primarily for students in Aerospace Engineering, Space Physics, Electrical Engineering and Computer Science and as an elective for others requiring physics at this level. The fundamental aim of the course is to provide a rigorous introduction to classical physics at a realistic level of conceptual and mathematical sophistication for students who are taking a second course in calculus. The emphasis is on developing an understanding of the basic principles. Problem solving is central to this course and practical applications are introduced where appropriate.

Textbook University Physics (14th edition) by Young & Freedman, Addison Wesley, Inc © 2016

This book gives an exhaustive and detailed explanation of physics principles and how to apply them. As a result, it's sometimes difficult to *see the forest for the trees*. In my lectures, I will strive to show how each of the concepts fits in to the grander body of knowledge that we call *physics*. Do not sell this book.

Attendance "Regular attendance and punctuality, in accordance with the published class schedule, are expected at all times in all courses." ***Don't miss class !!***

Course Outline

Chapter 11 Equilibrium and Elasticity (Review)

Chapter 12 Fluid Mechanics

1st Exam (10%)

Chapter 13 Gravitation

Chapter 14 Periodic Motion

* To be taught in PS303--Modern Physics

2nd Exam (15%)

Chapter 15	Mechanical Waves
Chapter 16	Sound and Hearing
Chapter 17	Temperature and Heat

3rd Exam (20%)

Chapter 18	Thermal Properties of Matter--Molecular Properties of Gases
Chapter 19	The First Law of Thermodynamics
Chapter 20	Entropy and the 2 nd Law of Thermodynamics

Final Exam (25%) **Comprehensive Exam**
Saturday, June 22, 2019 **1:00 – 3:00 PM** **55B**

Grading	Weight	
Homework	20%	A = 90 - 100%
Quizzes	10%	B = 80 - 90%
Exams	10/15/20% each (3 exams = 45%)	C = 70 - 80%
Comprehensive Final	25%	D = 60 - 70%

Mastering Physics

You will submit your homework assignments, quizzes, exams and final exam using Mastering Physics. If you do not have a Mastering Physics license, go to masteringphysics.com and purchase one. Once you have a license, you can connect to my course and its contents using the access code: **MPSMITH8168764**. The first homework assignment is due Wednesday, so, you should start reading Chapter 11 and start submitting your answers to the homework problems soon.

Homework

Homework is an essential part of this course. The homework sections at the end of each chapter are designed to develop and improve (1) your critical thinking skills, and (2) your ability to apply physics principles when solving physics problems.

Learning Outcomes (from the university syllabus):

1. Be able to understand what led Einstein to his postulates of theory of special relativity. Be able to solve problems in time dilation, Lorentz contraction and mass changes.
2. Work problems in rotational kinematics and rotational dynamics. Be able to use energy methods in rotational motion.
3. Be able to solve problems using Newton's law of gravity. Be familiar with Bohr's theory and emission and absorption spectra.
4. Define simple harmonic motion. Derive and use to solve problems, the basic relationships involving simple harmonic motion.
5. Be able to describe various types of wave motion and explain superposition and interference. Be able to solve problems involving the Doppler Effect, standing waves and natural frequencies.
6. Demonstrate your understanding of Pascal's and Archimedes' Principles by solving hydraulic and buoyancy problems. Derive and solve problems with Bernoulli's equation for streamline flow.

I am required to include the above (and incomplete) learning outcomes even though they do not include the topics listed for this course from the corresponding university syllabus—most notably, thermodynamics. This course will include four chapters of thermodynamics covering the topics described in the university syllabus.

Topics in modern physics (Relativity and Bohr's atomic model) are covered in PS303, the modern physics course, and will not be covered in this course.

Access To Learning

ERAU is committed to the success of all students. It is University policy to provide reasonable accommodations to students with disabilities who qualify for services. If you would like to discuss and/or request accommodations, please contact Disability Support Services in Hazy Library Room 109, extension 6750, or 928/777-6750.

Civil Rights Equity and Title IX:

ERAU seeks to provide an environment that is free of bias, discrimination, and harassment. If you have been the victim of harassment, discrimination or sexual misconduct, we encourage you to report this. If you inform me of an issue of harassment, discrimination, or sexual misconduct I will keep the information as private as I can, but I am required to bring it to the attention of the institution's Title IX Coordinator. If you would like to talk to the Title IX Coordinator (Liz Higgins Frost) directly, she can be reached at Building 49, Dean of Students Office, 928-777-3747, froste@erau.edu. For more information, please refer to the Nondiscrimination/Title IX webpage at <http://prescott.erau.edu/about/health/sexual-misconduct-and-title-ix/index.html>.