

## PS 160 02 (Physics II for Engineers) – Fall 2017

**Instructor:** Dr. Brian Rachford (rachf7ac@erau.edu)

**Web pages:** <http://mercury.pr.erau.edu/~rachf7ac/> (use the “Courses” link)  
<http://www.masteringphysics.com/> (course ID: PHYSICS2RACHFORD2017FA)

**Lectures:** MWF 1:00-1:50pm in AC1-107

**Office:** Bldg 74 (AC1) - Room 255 Phone: 928-777-3971

**Office hours:**

Monday: 11:00-12:00, 3:00-4:15

Tuesday: 12:00-3:00

Wednesday: 3:00-4:15

Friday: 11:00-12:00

And by appointment

**Grading:**

	Points distribution	Letter grades
Homework	20% (200 pts)	A: 90-100% (900-1000 pts)
1st midterm	20% (200 pts)	B: 80-90% (800-899 pts)
2nd midterm	25% (250 pts)	C: 65-80% (650-800 pts)
Final exam	35% (350 pts)	D: 50-65% (500-650 pts)

**Exams:**

Exam #1 Chapters 11-14 (Mechanics)

Exam #2 Chapters 15-18 (Waves/Thermo Part I)

Final exam Monday, December 11th, 12:30-2:30pm (Comprehensive including Chapters 19-20)

**Attendance:**

Regular attendance and punctuality, in accordance with the published class schedule, are expected at all times in this course. You are responsible for all material and information given in class. You may not make up missed work except for an approved excused absence.

**Textbook:**

“University Physics” by Young & Friedman (14<sup>th</sup> Edition). You are expected to read and understand the material covered in the textbook. The lectures will be more instructive if you attempt to read and understand the material before it is presented in class.

### **Homework:**

Problem-solving is an integral part of the course. We will use the Mastering Physics online platform for homework. If you have not previously used Mastering Physics in PS 150, you will need to obtain an access code from your existing textbook, the campus bookstore, or on-line. You enter your homework answers into the Mastering Physics site and receive immediate feedback on your answer. If your answer is incorrect, you have several additional opportunities to enter a correct answer, with a small penalty for each wrong answer.

Each homework problem is worth 2.5 points. In addition, there will be an “Adaptive Follow-Up” assignment worth another 2.5 points. If you score 90% or more on the main assignment for a chapter, you get the extra 2.5 points “for free”. Otherwise, you must complete the Adaptive Follow-Up to get those points. Remember, *all* of these points count towards your grade.

Homework assignments are generally due at 11:59pm on the next class day after we finish the chapter. Late homework will be accepted on a case-by-case basis with an excused absence (e.g., off-campus athletic, academic, or military activities, illness, etc.)

### **Assistance:**

If you have any questions or concerns, please ask in class, office hours, or by appointment. ERAU is committed to access for 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 (DSS). DSS is located on the first floor of Hazy Library, at the end of the hall. You may stop by, call 928/777-6750, or email the director at: **marcee.keller@erau.edu**

### **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>**

### **Continuity planning:**

In the event of a temporary campus closure due to an emergency or disaster situation, courses will continue via electronic communication using Canvas, email, or other services.

**Course description:****PS160 - Physics II for Engineers 3 credit hours**

This is a calculus-based study of the fundamental principles of classical mechanics and topics include rotational motion, simple harmonic motion, waves, fluid, heat, kinetic energy, and thermodynamics. Prerequisite: PS150; Corequisite: MA242

**Goals:**

This course is the second of a three-semester sequence, intended for students of science and engineering and is designed to provide the student with an appropriate background for more advanced physics and engineering course work. Problem solving is central to this goal, and practical applications are introduced where appropriate.

**Learning Outcomes (from the university syllabus):**

1. Define simple harmonic motion. Derive and use to solve problems, the basic relationships involving simple harmonic motion.
2. Solve problems involving wave motions, describe various types of wave motion and explain superposition and interference. Solve problems involving the Doppler Effect, standing wave and natural resonant frequencies.
3. Know how wave speed, wave frequency and wavelength are related.
4. Solve problems involving pressure measurements, variation of pressure with depth, and Archimedes' Principle.
5. Solve elementary fluid dynamics problems using the equation of continuity and Bernoulli's Principle.
6. Demonstrate an understanding of Thermodynamics; zeroth, first, and second laws. Entropy, Carnot cycle, heat engines, heat capacity, heat transfer, kinetic theory.
7. Demonstrate an understanding of Pascal's and Archimedes' Principles by solving hydraulic and buoyancy problems.
8. Derive and solve problems with Bernoulli's equation for streamline flow.

**Approximate schedule:**

	Monday	Wednesday	Friday
Week 1	28 Aug 2017 Introduction	30 Aug 2017 Chapter 11	01 Sep 2017 Chapter 11
Week 2	04 Sep 2017 Labor Day	06 Sep 2017 Chapter 12	08 Sep 2017 Chapter 12
Week 3	11 Sep 2017 Chapter 12	13 Sep 2017 Chapter 12	15 Sep 2017 Chapter 13
Week 4	18 Sep 2017 Chapter 13	20 Sep 2017 Chapter 13	22 Sep 2017 Chapter 14
Week 5	25 Sep 2017 Chapter 14	27 Sep 2017 Chapter 14	29 Sep 2017 Review
Week 6	02 Oct 2017 Exam 1	04 Oct 2017 Chapter 15	06 Oct 2017 Chapter 15
Week 7	09 Oct 2017 Chapter 15	11 Oct 2017 Chapter 15	13 Oct 2017 Mid-term break
Week 8	16 Oct 2017 Chapter 16	18 Oct 2017 Chapter 16	20 Oct 2017 Chapter 16
Week 9	23 Oct 2017 Chapter 17	25 Oct 2017 Chapter 17	27 Oct 2017 Chapter 17
Week 10	30 Oct 2017 Chapter 18	01 Nov 2017 Chapter 18	03 Nov 2017 Chapter 18
Week 11	06 Nov 2017 Review	08 Nov 2017 Exam 2	10 Nov 2017 Veteran's Day
Week 12	13 Nov 2017 Chapter 19	15 Nov 2017 Chapter 19	17 Nov 2017 Chapter 19
Week 13	20 Nov 2017 Chapter 19	22 Nov 2017 Thanksgiving	24 Nov 2017 Thanksgiving
Week 14	27 Nov 2017 Chapter 20	29 Nov 2017 Chapter 20	01 Dec 2017 Chapter 20
Week 15	04 Dec 2017 Chapter 20	06 Dec 2017 Review	08 Dec 2017 Study Day
Finals Week	<b>Final exam, Monday, Dec. 11th, 12:30-2:30pm</b>		