

Embry-Riddle Aeronautical University Prescott Campus

updated: Jan. 16, 2018

Course **PS250.02** **Physics III for Engineers (Spring 2018)** **3 credit hours**
Time T Th 2:50 – 4:05 PM AC1-104

Instructor **Dr. Darrel Smith**
Office Hours See my web page: <http://physicsx.pr.erau.edu/>

Office AC1 Room 253
Phone 777-6663

Course Description

This course is a calculus-based study of the fundamental principles of electricity and magnetism. It is the third course of a three-semester sequence, intended for science and engineering students and is designed to provide the students with an appropriate background for more advanced physics and engineering course work. Topics of discussion include: electric forces, electric fields, Gauss's law, Ohm's law, Ampere's law, Faraday's law, Lenz's law, Kirchhoff's law, and Maxwell's equations; electric potential and electrostatic potential energy; capacitance; simple DC circuit theory; magnetic force, magnetic field; inductance; electromagnetic oscillations and wave propagation; linear accelerators, and cyclotrons. Prerequisites: PS160 and MA242.

Goals

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 concurrently taking a third-semester course in calculus. The emphasis is on developing an understanding of the basic physical principles. Problem solving is central to this aim and practical applications are introduced where appropriate.

Textbook **University Physics (14th edition)** by Young and Freedman, Pearson, © 2016

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 21 Electric Charge and the Electric Field
Chapter 22 Gauss's Law
Chapter 23 Electric Potential
1st Exam (10%) "Electrostatics"

Chapter 24 Capacitance and Dielectrics
Chapter 25 Current, Resistance, and Electromotive Force
Chapter 26 Direct Current Circuits

2nd Exam (15%) "DC Circuits"

Chapter 27 The Magnetic Field and Magnetic Forces
Chapter 28 Sources of Magnetic Field
Chapter 29 Electromagnetic induction
Chapter 30 Inductance and Magnetic Materials

3rd Exam (20%) "Magnetic Fields"

Chapter 31 Alternating Current Circuits
Chapter 32 Electromagnetic Waves

Final Exam (30%) Comprehensive Final
8:00 – 10:00 am May 3, 2018 (Thursday)

Grading	Weight	
Homework	25%	A = 90 - 100%
Exams	10/15/20% each 3 exams = 45%)	B = 80 - 90%
Comprehensive Final	30%	C = 70 - 80%
		D = 60 - 70%

Homework Assignments

Homework Assignments are posted on the Mastering Physics website. To obtain a MasteringPhysics license, log on to masteringphysics.com and request a student license. If you have a MasteringPhysics license from a previous course, your license may still be active and you may not have to purchase a separate license. The ID for this course is:

MPSMITH71668

You will find your homework assignments for this course posted once you have accessed this course ID. The prelecture portion of your homework will constitute 5% out of 25%, while the homework problems will constitute 20% out of 25%.

Classroom Notebook

I encourage you to keep and maintain a notebook for taking class notes and recording the solutions to your MasteringPhysics homework problems. When you prepare for your 3 exams and your final, you will discover that your notebook is a useful study tool.

The best way to prepare for the exams is to understand how to solve the homework problems. You are responsible for understanding the solutions to homework problems as well as the material presented in class.

LEARNING OUTCOMES:

1. Describe the interaction of static electric charges, utilizing the concept of electric field and compute the electric field produced by simple charge distributions by direct integration and by employing Gauss's Law.
2. Define electric potential, potential energy, and capacitance, solve related problems.
3. Analyze the behavior of simple direct-current circuits, including resistance-capacitance arrangements.
4. Describe the interaction of moving electric charges utilizing the concept of magnetic field.
5. Describe Gauss' law for magnetism, creation of electric fields from changing magnetic fields (Faraday's Law) and the creation of magnetic fields from changing electric fields (Amperes' Law with displacement current).
6. Solve problems involving electromagnetic induction and motional EMF.
7. Define inductance, and analyze the behavior of resistance-inductance and inductance-capacitance circuits.
8. Describe the interplay of oscillating electric and magnetic fields required for propagating electromagnetic waves.

Tutoring

Tutoring will begin Tuesday January 16, 2018 with additional times and tutors added throughout the following weeks. Go to: **ERNIE → Services → Academics → Tutoring Schedule**

Tutoring is free and unlimited for all ERAU students. Always check the online schedule for updates and changes.

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>.

PS250.02	Spring 2018
Date	Assignment
Chapter 21	11-Jan
Chapter 21	16-Jan
Chapter 21	18-Jan
Chapter 22	23-Jan
Chapter 22	25-Jan
Chapter 23	30-Jan
Chapter 23	1-Feb
Review	6-Feb
Exam 1	8-Feb
Chapter 24	13-Feb
Chapter 24	15-Feb
Chapter 25	20-Feb
Chapter 25	22-Feb
Chapter 26	27-Feb
Chapter 26	1-Mar
Review	6-Mar
Exam 2	8-Mar
Spring Break	Mar 12-16
Chapter 27	20-Mar
Chapter 27	22-Mar
Chapter 28	27-Mar
Chapter 28	29-Mar
Chapter 29	3-Apr
Chapter 29	5-Apr
Chapter 30	10-Apr
Chapter 30	12-Apr
Review	17-Apr
Exam 3	19-Apr
Chapter 31	24-Apr
Chapter 31	26-Apr
Final Exam	3-May