

## PS113 Summer A 2018

**Instructor:** Dr. Darrel Smith

**Lectures:** PS113.01 MTWTh 11:05 – 12:35 Bldg. 58 - 106  
**No Lab**

**Web Page:** <http://physicsx.pr.erau.edu/> "hover" on Courses, and select PS113

**Office:** Building AC1 – Room 253 **phone:** 777.6663  
**Office Hours:** M T W Th 12:45 – 2:15 PM  
or other times by appointment

### Required Materials:

Textbook: [College Physics](https://openstax.org/details/college-physics) by Urone and Hinrichs—this is a free textbook.  
<https://openstax.org/details/college-physics>  
Calculator (not a cell phone calculator)  
You must purchase a [WebAssign](http://webassign.net) license to do the homework, exams, and quizzes for this class. <http://webassign.net>

<b>Grading:</b>	<b>Homework</b>	30%	90 – 100%	"A"
	<b>4 exams</b>	50%	80 – 90%	"B"
	<b>Quizzes</b>	0%	70 – 80%	"C"
	<b>Labs</b>	0%	60 – 70%	"D"
	<b>Final</b>	20%	< 60 %	"F"

**Final Exam:** The final exam is comprehensive and everyone is expected to take it on the officially scheduled date and time: **Saturday June 23, 2018 10:15 – 12:15** (Bldg 58-106)

**Attendance:** You are responsible for all material and information given in class. If you are absent, you run the risk of getting behind because this is a "summer course" and we meet every day. As you can see from the calendar, our PS113 summer schedule has an activity just about every day. The recitation work is done in-class on the computer, and you must be present to earn credit for it.

**Do not schedule other activities that conflict with the time schedule for this class!!**

**Homework:** Homework is an integral part of the course. You are expected to know how to solve all the assigned homework problems. Your homework assignments can be found on WebAssign located at **webassign.net**. Please login to [webassign.net](http://webassign.net) as soon as you can; "click" on ENTER CLASS KEY (in the upper right-hand corner) and enter the **Class Key: erau 7046 3992** and you will have access to the homework assignments and exams for this course. Exams and recitations are in-class and password protected, so, you cannot start them until you arrive in class. When are the quizzes and the exams? Check the "Schedule" tab on my web page: <http://physicsx.pr.erau.edu/>. Again, you will need to purchase a WebAssign license to gain access to the assignments and testing material.

**Textbook:** The textbook is free (see the information above). You are expected to read and understand the material covered in the textbook. The lectures are more instructive if you read and understand the material before it's presented in class. You should take advantage of working through the examples (shown in each of the chapters) to develop your confidence and problem solving skills before trying to work the homework problems.

**If you have questions,** please ask – either during class or during my office hours, or by appointment.

**Lab:** There is no lab for this course during summer A.

**Catalog Course Description: PS113 – Technical Physics I Lecture Hours: 3 Laboratory Hours: 1**  
Survey Course in elementary physics. Stress will be placed on basic physics principles. Problem solving and problem solving logic will be an important, integral part of this course. Topics will include Newton's Laws, projectile motion, circular motion, work, energy, conservation laws, momentum. (Cannot be used for credit in physics toward degrees in Space Physics, Aerospace Engineering, Electrical Engineering, or Aircraft Engineering Technology.)

**Prerequisites:** MA111 or MA120 or MA140

**Co-requisite:** MA112 or MA220 or MA241.

**Goals:** This is a required course in the following degree programs: Aviation Technology, Aviation Maintenance Management - Avionics, Avionics Technology, Aeronautical Science, Wildlife Science, Forensic Biology, and Cyber Security. This course is also a prerequisite for PS114. It is designed to provide the student with a strong background in basic physics. This will be accomplished by developing a student's skills in problem-solving techniques.

**Learning Outcomes:**

1. Define physical units most frequently encountered in physics.
2. Use trigonometric relations, vectors and methods of vector addition in solving statics problems.
3. Describe the motion of an object in one dimension, including freely falling bodies with regard to various reference systems.
4. Calculate displacement, velocity and acceleration using the equations of motion.
5. Apply the equations of motion in two dimensions with emphasis on projectile motion.
6. Make calculations using the concept of inertia, force and acceleration of objects.
7. Apply Newton's laws of motion and draw free body diagrams to analyze objects in equilibrium and in non-equilibrium.
8. Calculate the speed, centripetal acceleration and forces acting on objects executing circular motion and apply it to motion of a satellite and artificial gravity.
9. Apply the concepts of work, kinetic energy and potential energy in solving problems.
10. Calculate work done by constant forces, kinetic energy of moving objects, gravitational potential energy of an object and power developed as work is done.
11. Apply the principle of conservation of energy to solve a variety of problems.
12. Quantitatively discuss the relationship between impulse applied and the corresponding change in momentum experienced by objects.
13. Apply the principle of conservation of linear momentum to solve problems of elastic and inelastic collisions.
14. Calculate angular displacement, angular velocity and angular acceleration using the rotational kinematic equations.
15. Apply Newton's law of rotation and describe the concepts of moment of inertia, and rotational work and energy as well as power.
16. Solve rotational kinematic and dynamic problems using the concept of torque.
17. Solve problems involving center of gravity locations and use the principle of conservation of angular momentum.

**Prerequisite Knowledge by Topic:**

1. Solution of linear equations.
2. Solution of systems of equations.
3. Graphing techniques.
4. Exponents and roots.
5. Quadratic equation.

6. Ratio and proportion.
7. Elementary trigonometry.
8. Right triangle solutions.

**Topics:**

1. Mathematical Concepts
2. Kinematics in One Dimension
3. Kinematics in Two Dimensions
4. Forces and Newton’s Laws of Motion
5. Dynamics of Uniform Circular Motion
6. Work and Energy
7. Impulse and Momentum
8. Rotational Kinematics
9. Rotational Dynamics
10. Simple Harmonic Motion and Elasticity
11. Fluids

**Exams:**

Exam #1	Chapters 1-3	Kinematics
Exam #2	Chapters 4-5	Newton’s Laws
Exam #3	Chapters 7	Work and Energy
Exam #4	Chapter 6	Uniform Circular Motion, Gravity
	Chapters 8	Linear Momentum and Collisions
	Chapters 9	Equilibrium and Torques

**Final:**

Comprehensive final includes chapters 1-9.

**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](mailto: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>.*