PS113   Summer A   2017

Instructor: Dr. Darrel Smith

Lectures: PS113.01   MTWTh   11:05 – 12:35   Room 52B
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: Physics 10th Edition by Cutnell & Johnson   publisher: wiley.com   © 2015
Calculator (not a cell phone calculator)
Electronic Textbook:
https://www.vitalsource.com/referral?term=9781118899175

Suggested Materials:
"Student Study Guide"

Grading:				
Homework	25%	90 – 100%	"A"
3 exams	35%	80 – 90%	"B"
Quizzes	10%	70 – 80%	"C"
Labs	0%	60 – 70%	"D"
Final	30%	< 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 24, 2017   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. Late homework will not be accepted after 3 days (weekends excluded) and all late homework will be marked down 1-point for each day it's late.

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 as soon as you can and enter the institution name: **erau**, and the **Class Key: erau 9830 5406** and you will have access to the homework assignments, quizzes and exams. You will need to purchase a WebAssign license to gain access to the assignments and testing material. This is my second time using WebAssign, so, if I discover that its grading algorithms needs adjusting, I will make the necessary corrections (in your favor) as the semester progresses.

Textbook: You are expected to read and understand the material covered in the textbook (see Required Materials up above). 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 when trying to work 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 4-6	Dynamics & Work-Energy
Exam #3	Chapters 7-9	Impulse, Angular Kinematics and Dynamics
	Chapters 10-11	Simple Harmonic Motion, Elasticity and Fluids (on the final)

Final:

Comprehensive final includes chapters 1-11.

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 Building **43-109**, extension 6750, or (928) 777-6750.