

Syllabus

Course. University Physics I, PHYS 2325, Section 201, Spring 2010, MW 10:30–11:45, LBVSC 220.

Instructor. Dr. David Milovich, Assistant Professor, Dept. of Engineering, Mathematics, and Physics, david.milovich@tamiu.edu.

Office. Canseco Hall, 313C. Phone: (956) 326-2570. Office Hours: TR 10:30–11:30, MTWR 2:30–3:30, and by appointment.

You're welcome come to my office at times other than those listed above. If you want to make sure I'm there before you come, then call ahead and/or email me.

Course description. A calculus-based treatment of the fundamentals of classical mechanics, sound, fluid mechanics and heat. Topics include one and two dimensional motion, forces and Newton's Laws, momentum conservation, energy conservation, rotational dynamics, angular momentum, waves, simple harmonic motion, kinetic theory, calorimetry and thermodynamics. Prerequisite: MATH 2413 or equivalent, or concurrent registration therein. Must be taken concurrently with PHYS 2125.

Student learning outcomes. Upon successful completion of this course, the student will be able to:

- differentiate between a vector quantity and a scalar quantity;
- state Newton's three laws of motion and give everyday examples of each law;
- state the work-energy theorem and apply it to physics problems;
- state the law of conservation of energy and apply it to physics problems;
- state the law of conservation of momentum and apply it to physics problems.

Textbook. Required: *Physics for Scientists & Engineers with Modern Physics*. 4th Edition (2008). Douglas C. Giancoli. Prentice Hall. ISBN-10: 0-13-149508-9, ISBN-13: 978-0-13-149508-1.

The topics of this course are too broad for me to lecture on every detail. I expect you to read the chapters listed in the Approximate Schedule of Topics (see below) *before* we discuss those topics in the classroom. That said, in the table of contents of *Giancoli*, you will notice that most chapters have a few sections marked with a *. Unless I specifically ask the class to read such a section, consider it optional (but interesting!) reading.

I've also recommended (but not required) *Schaum's Outline of Mathematics for Physics Students*. This is a reference book not intended to teach you math

that you don't know, but to help you quickly look up some useful math that you might have forgotten.

Homework. Expect homework each week, unless there is an exam coming up. For homework and exam problems, your submitted solutions should include final answers and an organized presentation of the nontrivial steps you used to reach those answers. If you get the right answer but use a wrong step to get there, you probably won't receive full credit. Also, it's a good idea to initially solve problems on scratch paper and then write up more organized solutions. Finally, if you're not sure whether a step is trivial enough that you don't need to write it down in your submitted solution, ask yourself these questions. 1) Does the professor usually skip this kind of step in his lectures? 2) Was this step easy enough to do in my head, or did I need to write some things down?

In summary, **show your work and show it neatly.**

Ideally, every homework problem will be graded, but for each homework assignment I reserve the option to grade a selected subset of the homework problems.

Calculators. Calculators are strongly recommended for both homework assignments and for exams.

Exams. There will be two midterm exams and a final exam. The final exam will be comprehensive.

- Midterm I, in class, Monday, February 22.
- Midterm II, in class, Wednesday, March 31.
- Final Exam: during final exam week; exact time and place TBA.

Grading. Components: Homework 20%; Midterm I 25%; Midterm II 25%; Final Exam 30%. Final letter grade, given a total score of $x\%$: A: $x \geq 90$; B: $80 \leq x < 90$; C: $70 \leq x < 80$; D: $60 \leq x < 70$; F: $x < 60$.

Make-ups. There are no make-ups for missed work, except by situations covered by university rules. (See the Student Handbook.)

Approximate Schedule of Topics

Day	Date	Chapter	Topic
W	20-Jan	1	Intro
M	25-Jan	2	Motion
W		2	
M	1-Feb	3	2D kinematics
W		4	Dynamics
M	8-Feb	4	
W		5	More Applications
M	15-Feb	6	Gravity
W		6	
M	22-Feb	1-5	Midterm 1
W		7	Work & Energy
M	1-Mar	8	Energy Conservation
W		9	Linear Momentum
M	8-Mar	9	
W		10	Rotational Motion
M	22-Mar	11	General Rotation
W		12	Static Equilibrium
M	29-Mar	12	
W		6-11	Midterm 2
M	5-Apr	13	Fluids
W		14	Oscillations
M	12-Apr	15	Wave Motion
W			
M	19-Apr	16	Sound
W		17	Temperature
M	26-Apr	18	Kinetic Theory of Gas
W		19	Thermodynamics
M	3-May	20	Thermodynamics