

PHYS 121: General Physics I: Mechanics SYLLABUS AND COURSE CALENDAR: 25 August 2014



Syllabus and Summary Information:

- Content:** **Calculus-based Introductory Newtonian Classical Mechanics:**
Kinematics, Velocity, Acceleration, Vector Motion, Cartesian Unit Vectors, Circular Motion, Centripetal Acceleration, Projectile Motion, Particle Dynamics, Newton's Laws of Motion, Free-Body Diagrams, Contact Forces, Tension, Pulleys, Friction, Spring Forces, Work, Path integrals, Kinetic energy, Energy & Momentum Conservation, Classical Work-Energy Theorem, Classical Impulse-Momentum Theorem, Systems, Center-of-Mass, Elastic & Inelastic Collisions, Rotational Motion, Conservation of Angular Momentum, Torque, Simple Harmonic Motion, Damped Oscillators, Harmonic Waves, Gyroscopes, Gravity, Relativity, Some: Astrophysics, Cosmology
- Prerequisites:** One of these (concurrent) MATH 121 or MATH 125
or one year of high school calculus
- Schedule:** Lectures: M W F 11:30 to 12:20 PM in Strosacker Auditorium, Case Quad
Labs: every other week as scheduled.
- Instructor:** Corbin Covault, Rockefeller 207 (2nd floor)
Phone: 216-368-4006 (office) or 216-339-3861 (mobile)
E-mail: corbin.covault@cwru.edu
- Co-Instructor:** Craig Copi
Rockefeller 210 (2nd floor)
Phone: 216-368-8831 (office)
E-mail: cjc5@cwru.edu

(Syllabus and Summary Information continues next page....)

Syllabus and Summary Information Continued:

Course Web Page:	http://www.phys.cwru.edu/courses/p121	
Lab Web Page:	http://physicslabs.phys.cwru.edu/MECH/121	
Phorum Board:	http://www.phys.cwru.edu/forums/list.php?82	
Office Hours:	Generally Mon 1-4PM, Tue 1:30-4PM, and Fri 1:30-2:30PM, and other times by appointment.	
Online Text:	<i>Physics 121 Online Notes</i> by Bob Brown	
Recommended Texts:	<i>Physics for Engineers and Scientists, Vol 1, 3rd Ed.</i> by Ohanian and Markert <i>The Cartoon Guide to Physics</i> by Gonick and Huffman	
Also Recommended:	<i>ResponseCard RF LCD</i> by Turning Technologies (clicker, available at bookstore) Or, alternatively, <i>ResponseWare</i> software license (use your smartphone as a clicker)	
Required for Online Homework:	<i>The Expert TA</i> , software license: Class Code: 701485-LZ register at: https://www.theexpertta.com/registration/	
Required for Lab:	<i>Intro Mechanics Lab Manual</i> and a Lab Notebook (available in bookstore)	
Homework:	Worth 15% of your grade, as follows: 5% = <i>Online Homework</i> due weekly , usually Fridays, 11 PM via The Expert TA. 10% = <i>Written Homework</i> due weekly, usually Mondays, 5 PM outside Rock 207. Written Homework solutions by instructor, will be posted online. Eleven weekly homework assignments, lowest score will be dropped. <i>No late homework will be accepted under any circumstances.</i>	
Workload:	Homework	15% (11 homeworks, lowest score is dropped)
	1st hour exam (Fri Sep 19)	5%
	2nd hour exam (Fri Oct 17)	10%
	3rd hour exam (Fri Nov 14)	10%
	Laboratory	25%
	Final exam (Mon Dec 15, 4PM)	35%
Bonus Points:	<i>Entirely Optional:</i> Up to 5% extra points for clicker participation and for watching pre-lecture bonus video clips.	

PHYS 121 Fall 2014 Course Schedule:

Here is an *approximate* schedule for the course (subject to modification in the weekly reading and homework assignment). For this table, I count fifteen weeks in the class and label each week by the date of the Monday on that week. Note that all Hour Exams will be held on Fridays. **Important: the dates indicated for the Hour Exams and the Final Exam are fixed.** Also dates where no class will be held are so indicated:

	Monday	Assigned Reading from	
	Wk	Date	Online Notes: Important Dates
Cycle 1	1	Aug 25	Ch 00 to Ch 04
	2	Sep 01	Ch 05 to Ch 08
	3	Sep 08	Ch 09 to Ch 12
	4	Sep 15	Ch 13 to Ch 15
			No Class: Mon Sep 1
			1st Exam: Fri Sep 19
Cycle 2	5	Sep 22	Ch 01+ to Ch 04+
	6	Sep 29	Ch 05+ to Ch 08+
	7	Oct 06	Ch 09+ to Ch 12+:
	8	Oct 13	Ch 13+ to Ch 15+
			2nd Exam: Fri Oct 17
Cycle 3	9	Oct 20	Ch 01++ to Ch 04++
	10	Oct 27	Ch 05++ to Ch 07++
	11	Nov 03	Ch 08++ to Ch 10++
	12	Nov 10	Ch 10++ to Ch 13++
			No Class: Mon Oct 27
			3rd Exam: Fri Nov 14
Cycle 4	13	Nov 17	Ch 14++ to Ch 15++
	14	Nov 24	Gravity & Relativity
	15	Dec 01	Astrophysics & Cosmology
			No class: Fri Nov 28
			Fri Dec 05: Last Day of Class
		Dec 08	Reading Days, Dec 8, 12
		Dec 15	Final Exam 4PM to 7PM
			Review Session: Sat Dec 13, 1PM
			Final Exam: 4PM to 7 PM, Mon Dec 15

PHYS 121: Goals and Philosophy of the Course:

The main goals for for Physics 121 General Physics I: Mechanics are:

- To introduce students to the formal method of investigating the world through physical sciences, and in particular, to have students learn for themselves how physics as a discipline can be used to obtain a deep understanding of how the world works.
- To have students master the basic calculus-based mathematical formalism for describing the motion of bodies (called kinematics) and also to master the major paradigm called Newton Laws which seeks to explain the causes of that motion (dynamics) in terms of forces.
- To have students understand important reformulations and extensions of Newton's Laws which can provide powerful ways for explaining essential phenomena. These include the conservation laws (energy and momentum), harmonic motion, rotational motion, and motion due to the influence of gravity.
- To have students learn and be able to demonstrate a mastery of understanding and a consistent ability to apply these concepts and methods toward solving a broad range of both familiar and unfamiliar technical problems with clarity, precision, logical coherence, and mathematical sophistication.
- To have the students become familiar with a select set of modern physics topics so as to earn an appreciation for both the flavor of cutting-edge research and to gain a sense of the value of “thinking like a physicist” – a perspective that provides a powerful general approach to tackling a wide range of technical problems in almost any field of endeavor.