

## Physics 121: General Physics I (sections 01–03)

Fall 2014

Class: Workman Center 101, T-Th 09:30–10:45 am  
Recitation: MSEC 195 (-01), Workman 109 (-02), or Cramer 239 (-03)  
CRNs: 55820 (-01), 55821 (-02), and 57195 (-03)  
Corequisites: Physics 121L (lab), Math 131 (calculus I)  
4 credits

Class Instructor: Paul Arendt  
Office: Workman 305  
Phone: 835-5431  
email: *arendt "at" "our school domain"*  
Office hours: M 10-11:45 am, T 11 am-12 pm

### Course Designation:

Welcome to the first semester of General Physics. This course (and its companion lab course) will satisfy the first half of the introductory physics requirement for students pursuing a B.S. degree in majors other than physics.

### Course Description:

This semester, we will learn the basic laws of motion and mechanics, gravity, conservation laws, and thermodynamics.

### Reading Materials and Resources:

Required text: *Physics for Scientists and Engineers*, C. Knight, third edition, with Mastering Physics supplement. (You do not *need* the “with Modern Physics” version, but it’s OK if you have it; I even recommend it for your future reference if you can obtain that version.)

### Class webpage URL:

<http://infohost.nmt.edu/~arendt/Phys121/Phys121.html>

### Online homework (Mastering Physics):

<http://www.masteringphysics.com/>

M.P. Course ID: MPARENDT61323

### Homepage for iClickers:

<http://www.iclicker.com/>

### Moodle server (see “General Physics 1” or “Phys121Sect1-3-Fa14”):

<https://moodle.nmt.edu/>

(This uses your Tech email login and password for access.)

### Course Goals:

This semester, you will gain a working understanding of the basic laws of non-electromagnetic physics, including laws of motion, thermodynamics, and conservation laws.

### Attendance:

Attendance of the freshman physics classes is *required*, both for the main class and recitations. We will be using the iClicker response system to interact during class time; your participation in this will count as your participation class grade (with correct answers worth extra credit). To check out an iClicker for the semester costs 2 dollars at the library. If you already have an iClicker (personal

property, or checked out for another class), you do not need to check out another one for this class (the same one will work). You may instead download an iClicker app for your smart phone from their web site, if you prefer.

For the recitation sections, attendance will be taken by the weekly quiz (see quizzes below).

**Grading:**

Your grade will be based upon homework (35 %), exams (50 %), quizzes (10 %), and participation (5 %).

*Homework:* will be assigned and due once a week, on average. There will be two types of weekly homework: written problems to be turned in, and online (Mastering Physics) problems which are graded automatically and immediately. The online homework allows up to 5 tries each question (with a slight penalty for each wrong answer given), and offers hints if needed (a bonus will be given for not using these). Late homeworks will be accepted for full credit on the day they are due, and will lose points after that (depending upon how late they are), both for written and online assignments. You are allowed and even encouraged to work in groups on homework assignments, but the finished homework that you turn in must be your own writing (or typing), and you should show all important intermediate steps. Make sure to always give the physical units (dimensions) of the final answers on exams and homeworks!

*Exams:* We will have 4 exams throughout the semester. The fourth exam will be given during the final exam scheduled for the class, and will be partly over the last quarter of the class and the rest comprehensive (covering the entire semester). Calculators are allowed and even encouraged. However, **calculators must not be internet-capable** for exams, so obtain a cheap one (which will at least have trig functions on it) rather than using an app on your smart phone. The exams will be closed book and closed notes, with the exception that you are allowed to construct a ‘cheat sheet’ for each exam. This should consist of writing on one side only of a *single* 8.5 by 11 inch sheet of paper. Creating your cheat sheet is a good way to help study for the exams. I will provide a study guide for each exam on the class webpage with all of the important information you are responsible for briefly summarized; you are welcome to use it as a guideline to construct your cheat sheet (and even to photocopy and reduce it, if you prefer). The idea is not that you must memorize all of the important equations, but that you should be able to use the equations correctly during an exam. Please keep your cheat sheets 1-3 as you will be able to use them again during the comprehensive portion of the final exam.

*Quizzes:* We will have daily iClicker quizzes in class; however, these just count toward your participation score, even if you get them wrong, but correct answers will be worth extra credit. Each week in recitation, you will solve problems out of the book and turn one in (with multiple tries allowed, if incorrect) for a weekly quiz score; perfect attendance in recitation should therefore give a perfect quiz score.

**Getting Help, and Academic Honesty:**

There are many resources available to help you with problems or concepts which you find difficult. I encourage and even expect most of you to work

with each other on many of the homework problems; however, please *share* the workload and be fair about it. The work that you turn in should be written by you, even if you have worked together on an assignment. On exams, absolutely no help from others nor internet access will be tolerated; please see the Academic Honesty policy on pp. 59–70 of the undergraduate catalog for details.

The graduate students provide tutoring at the (free!) help sessions in Workman 110 (center of the downstairs floor); I will post the schedule after it is made (end of the first week). The Office for Student Learning is also going to provide us with a class learning coach and other tutors; I will also post their schedule when it is announced. I am also happy to answer your questions during (or after) class, or at my office.

The class webpage will have links to many online resources. Particularly helpful are the Physics Forums boards, where you can find literally *thousands* of folks online at any time, who are ready to give hints for homework problems and answer other physics and math questions. I may also reactivate a class message board if there is interest; just let me know.

New Mexico Tech is committed to protecting the rights of individuals with disabilities. Qualified individuals who require reasonable accommodations are invited to make their needs known to the Office of Counseling and Disability Services (OCDS) as soon as possible. To schedule an appointment, please call 835-6619.

This is also the number to call for counseling services: New Mexico Tech offers mental health and substance abuse counseling through the Office of Counseling and Disability Services. The confidential services are provided free of charge by licensed professionals. To schedule an appointment, please call 835-6619.

**Pace of the Class:**

Since this class is an introductory one, and because there are *many* different topics to introduce, the coverage of each will necessarily be rather brief; there is a lot of stuff! We will often cover a chapter or even more each week. It's a lot easier to keep up than to catch up, so it's very good advice to not fall behind.

Good luck, and have a great semester!

Physics 121 schedule (subject to change), Fall 2014

Wk	Dates	Class Topic	Reading (during week)	Labs
1	08/18/14	Motion Concepts	Ch. 1,2	No Lab
2	08/25/14	1D Motion, Vectors	Ch. 2,3	Measurement Uncertainty
3	09/01/14	Vectors, 2/3D Kinematics	Ch. 4	Accel. of Grav.& Vec. Addition
4	09/08/14	Force	Ch. 5,6	Proj. Motion
5	09/15/14	Newton's Laws	Ch. 7	Newton I
6	09/22/14	2/3D Mechanics, <b>Exam 1</b>	Ch. 8	Newton II
7	09/29/14	Cons. of Energy	Ch. 8,10.1-10.6	Binary Stars
8	10/06/14	Work & Energy	Ch. 11	Collisions in 1 and 2D
9	10/13/14	Momentum, Impulse	Ch. 9	Rolling without Slipping
10	10/20/14	Collisions, <b>Exam 2</b>	Sect. 10.7	Angular Momentum
11	10/27/14	Rotation Dynamics	Ch. 12	Inelastic Collisions
12	11/03/14	Angular Momentum	Ch. 12	Gyroscope
13	11/10/14	Gravity	Ch. 13	Harm. Osc.
14	11/17/14	Oscillations, <b>Exam 3</b>	Ch. 14	Thermal Energy
15	11/24/14	Thermodynamics	Ch. 16, 17	No Lab (Thksg. Week)
16	12/01/14	Kinetic Theory	Ch. 18, 19	No Lab
17	12/08/14	<b>Final Exam</b>	Ch. 1-19	No Lab (Finals)