Physics 122 – 01, – 02, and –03: General Physics II

CRNs: 62122 (-01), 62123 (-02), 62818 (-03)

Fall Semester 2017

Lecture: Workman Center 101, T Th 11:00-12:15

Recitation: (Work. 113) Tues. 4:30–6:25 pm (-01), Wed. 4:30–6:25 pm (-02), or Wed. 7:00–8:55 pm (-03)

Corequisites: Physics 122L (lab), Math 132 (Calculus II)

4 credits *(Lab is a separate 1-credit course)*

Class Instructor: Paul Arendt
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Office Hours: (to be announced)

Course Designation:

Welcome to the second semester of General Physics. This course finishes the introductory physics requirement for students pursuing a B.S. degree who are not majoring in physics.

Course Learning Outcomes:

This semester, you will gain a working knowledge of the laws of electromagnetism, including electromagnetic forces, sources of electromagnetic fields, circuits, and the properties of electromagnetic radiation. We will begin with a brief look at optics and the wave phenomena of radiation.

Program Learning Outcomes:

Successful completion of this course is required for all Bachelor of Science degree programs at New Mexico Tech, and concludes the introductory physics requirement for all majors except Physics.

Reading Materials and Resources:

Required Textbook: *Physics for Scientists and Engineers*, D. C. Giancoli, 4th edition, with Mastering Physics supplement. (Additionally, most other calculus-based introductory physics texts will cover the same material and can be studied in parallel; the OpenStax University Physics is a free on-line example and many hardcopy examples are available in the library and study rooms.)

Class webpage URL:
`http://infohost.nmt.edu/~parendt/Phys122/Phys122.html`

Material will also be on the Canvas server:
`https://nmt.instructure.com/`

Our course there is called "PHYS-122-01." You should already have access to this course if you are enrolled in one of the class sections. (Most material will be available from both Canvas and our webpage, but *slides from the lectures will only be on Canvas* to prevent copyright issues with images used from the publisher.)

Online homework (Mastering Physics):
`http://www.masteringphysics.com/`

MP Course ID: MPARENDT122FALL17

(Please be sure to enter this *exactly* when you sign up, or there could be many problems to fix if you accidently become enrolled in a different class!)

Homepage for iClickers:
`http://www.iclicker.com/`

We will cover material from the textbook as outlined below (see "Pace of the Class" for details). In addition, the homework assignments and various online reading resources will be available from the class webpage.

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 5 percent of your course grade. Correct answers will be worth extra credit in this area. If you already have an iClicker, you do not need to get another one for this class (the same one will work). Please visit the iClicker webpage (given above) and follow the instructions to register your clicker once you obtain it; this will ensure that your answers are credited to you.

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 %), recitation quizzes (10 %), and class participation (5 %). Although reciation is combined into your course grade, the lab class is counted completely separate as its own 1-credit course.

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! I wish this didn't need to be pointed out, but it does: do your homework! Simple math shows that if you do not, your class grade will go down by 35 percent – more than 3 letter grades downward.

Exams: We will have 3 regular (in-class) exams throughout the semester, and a mandatory comprehensive final. Calculators are not only allowed, but

encouraged! However, cell phones and other internet-ready devices (even if an "app" on one *is* your calculator) are forbidden during exams – a simple calculator which has trig functions typically only cost a few dollars, so get one if you need to. 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. I will also provide a sample cheat sheet; think of this as a guideline for the minimum which you ought to put on your cheat sheet. 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. Keep your old cheat sheets, as you can use all of them for the final exam.

Quizzes: We will have daily iClicker quizzes in class; however, these just count toward your participation score (unless you get the answer correct, which gives extra credit). Each week in recitation, you will work out problems in groups and turn one in (with multiple tries allowed, if incorrect) for a weekly quiz score; perfect attendance in recitation should therefore give a perfect score. Conversely, if you do not attend recitation, expect your grade to drop by 10 percent (one letter).

Attendance/Participation: is counted using the iClicker response system. 5 points are awarded for attending each day (answering iClicker questions), and one additional point of *extra credit* is given for each correct response given. Although this is only worth 5 percent of the grade, statistics on past courses show *overwhelmingly* that your iClicker score is correlated most strongly with your overall grade in the course. The lesson is clear: in order to do well in the course, come to each class and pay attention!

Pace of the Class:

As is typical for the introductory science classes, we will cover *many* different topics, and so we can spend only a short time on each before moving on (usually, building upon what has come before). So, do keep up – it's to your advantage!

Brief Schedule by week (Last updated 21 Aug.):

1. 21 Aug.: Chs. 32-33;	**No Lab**
2. 28 Aug.: Chs. 33,15;	**Lab:** Snell's Law
3. 04 Sep.: Chs. 16,34;	**Lab:** Geometric Optics
4. 11 Sep.: Chs. 34-35;	**Lab:** Standing Waves
5. 18 Sep.: Ch. 21;	**Lab:** Interference/Diffraction
6. 25 Sep.: Ch. 22;	**Lab:** Oscilloscopes
7. 02 Oct.: Ch. 23;	**Lab:** Velocity of EM Waves
8. 09 Oct.: Ch. 24; *(Midsemester!)*	**Lab:** Elec. Field Comp. Lab
9. 16 Oct.: Chs. 25,26;	*49'ers week;* **Lab:** Equipotentials
10. 23 Oct.: Ch. 27;	**Lab:** Capacitors
11. 30 Oct.: Ch. 28;	**Lab:** Ohm's Law
12. 06 Nov.: Ch. 29;	**Lab:** Circuits

13. 13 Nov.: Chs. 29, 30;	**Lab:** Magnetic Forces
14. 20 Nov.: Ch. 31;	No class Thurs. 23rd; **No Lab**
15. 27 Nov.: Finish ch. 31;	**Lab: Faraday's Law**
16. 04 Dec.: (Catch-up);	**No Lab**
17. 11 Dec.: Finals week;	**No Lab**

Exams will likely be after ch. 35 (exam 1), after ch. 24 (exam 2), after ch. 28 (exam 3), and after the whole semester (final exam). We will lose class lecture days to exams, so the syllabus will likely "advance" and fill week 16 as the semester progresses.

Getting Help:

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.

The graduate students and OSL tutors will have scheduled times dedicated at the OSL (upstairs in Speare Hall); hours will be posted after they have been scheduled. I am also glad to answer your questions during (or after) class, or at my office (during office hours, and also whenever I'm not too busy with other things); email if you would like to set up an appointment.

The class webpage has links to many online resources. Particularly helpful are the Physics Forums boards, where folks at all hours are ready to give hints for homework problems and answer other physics and math questions. We can also set up a class message board for HW help on Canvas if there is interest – let me know if so!

Reasonable Accommodations:

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.

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.

Academic Honesty:

New Mexico Techs Academic Honesty Policy for undergraduate students is found starting on page 64 of the NMT Undergraduate Catalog:
`http://www.nmt.edu/images/stories/registrar/2015-2016_UNDERGRADUATE_Catalog_FINAL.pdf`

You are responsible for knowing, understanding, and following this policy.

Respect Statement:

New Mexico Tech supports freedom of expression within the parameters of a respectful learning environment. As stated in the New Mexico Tech Guide

to Conduct and Citizenship: New Mexico Techs primary purpose is education, which includes teaching, research, discussion, learning, and service. An atmosphere of free and open inquiry is essential to the pursuit of education. Tech seeks to protect academic freedom and build on individual responsibility to create and maintain an academic atmosphere that is a purposeful, just, open, disciplined, and caring community.

Good luck, and have a great semester!