

PHY104 LAB (sections 10L, 11L, 12L, and 13L) Fall 2015 - Syllabus

Lab meets in 214 Cowley Hall:

Thu 10L (3:20p-5:20p)

Fri 11L (9:55a-11:55a)

Thu 13L (5:30p-7:30p)

Fri 12L (12:05p-2:05p)

Instructor: Dr. Rob Salgado, 116 Cowley

Office Hours: [as of Sep 8, 2015] Tu 3:20-4:15p, Wed 9:55-10:45a, Thu 2:15-3:10p
[check D2L for updates] or, by appointment, or drop into my office

Email: rsalgado@uwlax.edu (best way to reach me - please include **104 Lab** in the subject line)

Course Content

There will be 11 labs over the course of the semester designed to accomplish these two goals:

- 1) To solidify your understanding of the principles you learn in the Physics 104 lecture by demonstrating them *experimentally*
- 2) To help you gain experience with *laboratory techniques* and the *analysis and interpretation* of experimental data.

These labs focus on the connection between **experiment** and **theory** [a *summary of a body of knowledge that... has been supported with repeated testing by experiment and makes new predictions that is subject to more testing by new experiments*].

Almost all of the labs will emphasize (a) first using basic concepts to make theoretical predictions, followed by (b) performing the experimental test to verify the prediction. To make the theoretical predictions, you will have to do things on a more advanced level than simply “plug numbers into an equation and get the answer”. In typical experimental work, the limitations imposed by available measuring equipment compel us to *devise indirect methods* of measuring quantities of interest! Often, this involves applying basic physical laws to derive the appropriate formulas which *relate the “quantities of interest” in terms of the “quantities we can directly measure.”*

Laboratory handouts

When you arrive at lab, you will receive that week’s explanatory handout.

(Previews will be made available in advance on D2L. Final versions are what are distributed in class.)

An electronic version will then be posted on D2L. These handouts include background info, instructions on how to perform the experiments, sample exam questions, etc...

You are responsible for:

- (If given in advance) Reading through the appropriate section before coming to lab
- Working through the lab during the laboratory period
- Reviewing the handouts *and your notes* prior to each lab exam

You should take notes during the labs; this can be directly on the handouts or in a separate notebook.

You should record your experimental setup, results, conclusions, etc.

These notes will **not** be graded, nor will you be required to turn in any lab reports. However, **the lab exams will contain both theoretical and practical problems based entirely on the lab handouts which you have completed.** It is in your best interest to keep accurate notes so that you can study for the exams! And note that the “Sample Exam Questions” contain many *actual* exam questions from previous years’ exams.

Attendance and Participation (required)

An attendance sheet will be kept, which *you should sign each week.* **Plan for each lab to take the allotted 2 hours.** Some labs may be shorter than that, but you cannot plan for a given lab to let out early. **DO NOT** schedule other appointments during lab time. **DO NOT** work on other items during lab.

Making up Labs to be Missed (*but don't make a habit of this*)

If you cannot attend your regular lab section, you may be able to make up that week's lab as follows:

- Please **let me know *in advance*** (with at least an email) and **preferences** for an alternate 104-Lab section to attend during the **same** week. (The 104-Labs meet Thursday starting at 3:20p and 5:30p and Friday starting at 9:55a and 12:05p.)

“Grading”

Your laboratory grade will be based on two laboratory examinations (one for the first 6 labs, the second for the remaining 5 labs). Each exam will be worth half of your laboratory score. Since attendance and participation is required, absence may result in a decreased final score.

Your score will be reported to the PHY104 lecture instructor, who will [alone] incorporate that score for the laboratory into your overall course grade. **A final-lab-score of at least 55% is required in order to obtain passing grade in PHY 104.**

Exams

As mentioned above, there will be two lab exams, each covering roughly half of the semester. The exams are closed-book, closed-notes, and are heavily based on the lab activities you performed. An equation sheet will be provided.

Some exam problems will test your ability to make experimental measurements. Some problems will test your ability to analyze experimental data. Others will test your understanding of the physics involved in the lab experiments that you performed. Others may combine some of the above.

As mentioned above, the “Sample Exam Questions” in the lab handouts contain some actual exam questions from previous years' exams, along with other questions that I think might be good, so be sure to study these questions prior to the exams.

Accommodations (*arranged in advance, if possible*)

“Any student with a documented disability (e.g. ADHD, Autism Spectrum Disorder, Acquired Brain Injury, PTSD, Physical, Sensory, Psychological, or Learning Disability) who needs to arrange academic accommodations must contact The ACCESS Center (165 Murphy Library, 608-785-6900, ACCESSCenter@uwlax.edu) and meet with an advisor to register and develop an accommodation plan. In addition to registering with The ACCESS Center, it is the student's responsibility to discuss their academic needs with their instructors.”

“Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, disabilities) are welcome and encouraged to communicate these, in advance if possible, to the instructor.”

Students will be allowed to complete exams or other requirements that are missed because of a religious observance, provided arrangements are made *in advance*.

104 LAB SCHEDULE (Fall 2015)

10L Th3:20-5:20 11L F9:55-11:55
13L Th5:30-7:30 12L F12:05-2:05

(Thursday & Friday)

Sep 10,11	lab 01: Charge on a Cup (Coulomb Force)
Sep 17,18	lab 02: Electric-Field Mapping (Computer Simulation)
Sep 24,25	lab 03: Circuit Elements (Ohm's Law)
Oct 1, 2	lab 04: Oscilloscope and Waveforms
Oct 8, 9	lab 05: Kirchhoff's Rules [resistive circuits]
Oct 15,16	lab 06: RC Circuit
Oct 22,23	LAB EXAM 1 (covering labs 01-06)
Oct 29,30	lab 07: Magnetic-Field Mapping
Nov 5, 6	lab 08: Motion of Charged Particles (Computer Simulation)
Nov 12,13	lab 09: Reflection and Refraction
Nov 19,20	lab 10: Lenses
Nov 24-27	(no labs)
Dec 3, 4	lab 11: Diffraction and Interference
Dec 10,11	LAB EXAM 2 (covering labs 07-11)

(Dec 16 – Semester Ends)