

## SYLLABUS FOR PHYSICS 481 LAB

<b>Course:</b>	Physics 481L, Advanced Physics Lab
<b>Meets:</b>	Section I <i>Tuesdays</i> from 12:00pm to 2:50pm in Watanabe 221 Section II <i>Thursdays</i> from 12:00pm to 2:50pm in Watanabe 221
<b>Text:</b>	Experimental Physics by A. Melissinos and J. Napolitano (2 <sup>nd</sup> ed.)
<b>References:</b>	Handouts in the lab instruction.
<b>Instructor:</b>	Prof. Thomas Browder, WAT 224, 956-2936
<b>Office Hours:</b>	Open or by appointment
<b>Email:</b>	teb@phys.hawaii.edu

Physics 481L covers several advanced experimental topics in modern physics. Physics 481L consists of three to four experiments. All experiments must be completed in order to obtain a passing grade in this course. Working in teams of 2 or 3 persons, you will perform experiments on the muon lifetime in cosmic rays, X-ray spectroscopy and the Mossbauer effect. For each experiment you will turn in your lab notebook and a **Physical Review Letters style paper** reporting the results. The first drafts of the reports will be due at the end of the third week, sixth week and tenth weeks of the semester. The grade for the course is almost entirely (95%) based on your written work.

The final results of your experiment will be a short (1500-2000 words) report of the type that appears in the journal Physical Review Letters. The report should include the following parts:

- Abstract (200-300 word summary including the result)
- Background (history and the motivation for the experiment)
- Apparatus (general, including resolution etc.)
- Procedure (do not list data here)
- Calculation of results and errors
- Discussion (compare with theory and other experiments here)

Be sure to write complete sentences. Pay attention to agreement of the subject and verb. Organize our report into paragraphs with a lead sentence. You may want to make an outline before starting to write. Read what you have written out loud either to yourself or someone else. Does it make sense? Consider my suggestions for writing good lab reports and make sure your grammar is correct.

After I receive your first draft on the dates indicated I will read them and make comments on physics and on writing, I will indicate a tentative grade for the experiment and return your paper. You may submit a second or third draft to try for an improved grade. Please visit my office in WAT 224 if you have questions or problems with writing. If the first draft is late, you will lose one grade step on your final grade for the experiment (A to A- to B+...) for each day after the due date.

You should use a word processing packages such as WORD or LATEX to compose your reports. I suggest you turn in drafts with all figures included so that you can resubmit the report without completely redrawing the figures. Of course, I may ask you to make changes in the figures.

You can find additional help with writing at the web site of the Manoa Writing Program at <http://mwp01.mwp.hawaii.edu/>. Follow the “Student Resource & Information” link, followed by the “Help for Writers” link. Notice that you can make an appointment to get help with your writing by calling the Writing Workshop (956-7619).

You must obtain a bound laboratory notebook or computation book of the type I will show you. Each member of a team should record their answers to the self-test questions, experimental procedures, setups and data in his or her lab book. As data is recorded it must always be entered on an informal plot in the lab book. One team member may initially record and plot the data so that the others can subsequently copy it. Each day’s work should be dated. Be sure to record enough information so that you can tell me exactly what you did and what settings were used on the equipment. You need not write complete sentences, but be clear and neat.