

Syllabus (Spring 2009)
PHY105/135
PHYSICS LABORATORY (1 credit hour)

Instructor: Tohru AZUMI, PhD Visiting Professor of AIU,
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Office hours: Wednesday & Thursday: 15.00-19.00; Office: A35 (A Building, 2nd Floor)
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Meeting times: Wednesday (Section 1) 18.30-20.10; Thursday (Section 2) 18.30-20.10

DESCRIPTION:

In this course, students themselves are going to carry out laboratory experiments related to physics. The entire course is designed so that students will be able to understand the fundamental concepts of physics.

OBJECTIVES:

Physics is essentially an experimental subject and thus must be understood as different from mathematics. Although theory is important, it is simply a tool for systematically explaining numerous experimental facts. The primary objectives of this course are to (1) develop the skills needed to set up the equipment required to test models or theories and (2) be able to interpret experimental results and develop correct conclusions.

STUDY MATERIALS:

Lab manuals specially prepared by the instructor will be provided each week.

You will need a calculator. In many experiments, only simple arithmetic calculations (+, −, ×, ÷) will be sufficient. However, once in a while, you may need trigonometric functions. If you have a scientific calculator, bring it with you. If you do not have it, you do not have to buy only for this class. You could use a scientific calculator preinstalled in the computer in the laboratory.

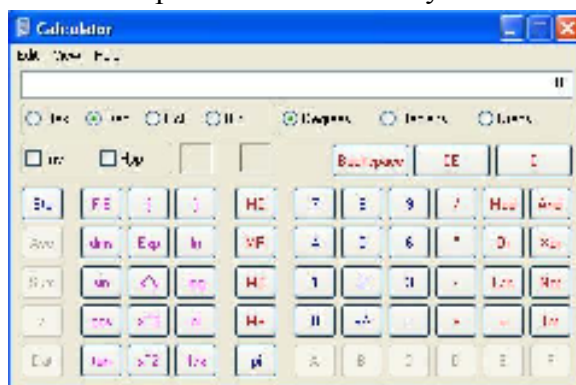
You can open the scientific calculator in the following manner.

Start → Programs → Accessories → Calculator

If the calculator you see is not the scientific calculator you can change it into scientific calculator as follows:

View → Scientific.

Help menu will show you how to use.



ASSESSMENT: Student achievement of the course will be measured in terms of student performance in the following areas: (1) Reports describing the results and discussion of each experiment (40 %), (2) Degree of participation in group experiments (40 %), and final examination (20 %).

EXPECTED ACADEMIC BACKGROUND: None

GROUP EXPERIMENTS

Usually, experiments will be carried out with a group of two to three students. The groups will be determined by you by a draw. At the beginning of each class, you are to select one card, and the numbering of the card specifies your group number (group 1 through group 6).

POLICIES

1. Policy on attendance:

Attendance is basically mandatory. You are expected to attend all the classes and actively participate into group experiments. For those of you who have to be absent due to legitimate reason will be given a chance of makeup.

Usually, important instruction will be given at the beginning of each class. It is thus very important that you attend the class punctually. It is expected that you come to the class at least five minutes before the class starts. Delayed attendance will be counted as one-half absence.

Fortunately, we have two sections: one in Wednesdays and one in Thursdays. Thus, the easiest way for you to do makeup is to join the other section in the same week. In this case, **it is basically expected that you inform the instructor beforehand through e-mail or orally**. If you can makeup in this way, you can work together with other students. Otherwise, your makeup experiment might have to be carried out by you alone.

For those of you who have to be absent due to job hunting, special arrangement will be provided.

2. Policy of reports

At the end of each week, you are expected to submit the report briefly describing the results of experiments.

Basically, you are to submit the report at the end of each class; however, if you are unable to finish it by time (i.e., by 20:10), you can submit it before the following week with instructor's permission. The submitted report will be returned to you within a week.

Try not to loose any of the returned reports because you are allowed to bring in all the returned reports in the final examinations.

FORMAT AND ACTIVITIES: The class basically starts with description of theoretical background. After this, each group of students is expected to do experiments. The last 30 minutes will be spent for writing the report.

TENTATIVE SCHEDULE:

* Note that Friday, May 8 will be the Wednesday class day.

Date Section 1	Date Section 2	Theme
4/15	4/9	Introduction Significant Figures
4/22	4/16	Monte Carlo Method to Determine π
5/8*	4/23	Linear Motion (1) Slow Motion of Your Walk
5/13	5/14	Linear Motion (2) Motion of a Cart Along a Slope Determination of the Earth's Gravity
5/20	5/28	Newton's Second Law of Motion
6/3	6/4	Weight in Accelerating Frame Apparent Weight
6/10	6/11	Force of Buoyancy
6/17	6/18	Temperature and Heat Transfer
6/24	6/25	Determination of the Size of a Nucleus
7/1	7/2	Greenhouse Effect
7/15	7/16	Diffraction of Light. Determination of Wavelength of a Laser Light
7/22	7/23	Continuous and Discrete Energy Observation of Emissions by a Home-Made DVD Spectrometer
7/22	7/23	Conversion of Kinetic Energy into Heat. Student Evaluation
7/29	7/30	Final Examination