Syllabus: Introduction to Experimental Physics

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Instructors
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Purpose

This is the first lab course for physics major at SJTU. The lab covers some basic experiments in mechanics, E&M, and optics & wave. The main purpose of this course is not to gain theoretical understanding in these topics, but rather to provide students hand-on experience working with basic lab equipment, and guide them to think how to design scientific experiments. Students will also learn basic data analysis techniques in this course.

Things you should expect

Unlike "traditional" physics labs, in this course the lecturing and help from the instructor/TA will be minimal. Each lab will be performed in two 3-hour sessions. You are encouraged to read about the lab principle before you come to class. In the first session, you should get familiar with the experimental setup (in many cases you will need to figure out things on your own), and start collecting data. In the second session, the instructor will cover selective topics in data analysis, and then you should work on the data analysis and lab report in a scientific manner.

Language

The lab manual will be in English. Your instructor will speak 100% English in the lab. You are encouraged to stick to English, though bilingual attempt will also be supported. Your lab reports are required to be written in English.

Lab time/Location

Experimental Physics Center.
Tuesday 18:00-20:15

Lab work

Two students will form a group working on the experiments together. You must work on the data analysis independently.

Lab report

Both English and Chinese are accepted.
A scientific report consists of the following parts

- Goal of the experiment
- Principle of the experiment and descriptions of the setup
- Measurements
- Data analysis (including uncertainty analysis and MATLAB code)
- Discussion and conclusion

Please use your own terse language. Long copying from your lab manual is a waste of your and your grader's time, and your grade will suffer.

Use ORIGIN to perform data analysis. You need to include your work book in your lab report.

The lab report is due 1 week after the 2nd session of each lab. Late submission will not be graded unless you give your instructor advanced notice and he/she agrees.

Grades

Your performance in each lab (in particular how independent you are in solving problems) will be worth 50% of the grade. Your lab report will account for the other 50%.

Copying other's lab reports is against the scientific honesty code. If found, you will not receive any credits for the lab!

Sickout & makeup classes

If you have to miss out the lab work, a makeup session can be arranged during Week xxxx. You should make appointment with your instructor beforehand.

Experiments list（Physical Experimental Building）

Exp.1 Measurement of focal lengths for thin lens, Error analysis, Rm. 307
Exp.2 Measurement of harmonic oscillation, Rm 416, introduction to Origin, Rm.416
Exp.3 Measurement of speed of sound, oscilloscope, Rm. 201
Exp.4 Measurement of liquid viscosity, Matlab in physical experiments ,Rm. 309
Exp.5 Temperature sensors, Labview, Rm. 301
Exp.6 Self designed

Students Group

G1

沈沛约
曹铭耘
傅啸坤
孙蓟策
蒋康安
王膺涵
曾志坤
刘翔敏
钱星月
文丽
徐秋雨
杨矜群

G2

张雨荷
陈家盛

陈玉鹏
代英杰
高海翔
何继路
黄俊锟
黄伟
姜博放
姜歆焕
金团
刘哲源
G3
陆浩然
陆奕成
毛清昊
尚进
谈咏麒
王超玥
吴烁杭
姚依嵩
叶卓杨
张万强
周锐鑫

Class schedule

Wednesday (International Class)

Week	Dr. Li' Class	Dr. Zhu's Class	Dr. Wang's Class
2-3	Exp.1 G1	Exp.2 G2	Exp.3 G3
4-5	Exp.1 G2	Exp.2 G3	Exp.3 G1
6-7	Exp.1 G3	Exp.2 G1	Exp.3 G2
8-9	Exp.4 G1	Exp.5 G2	Exp.6 G3
10-11	Exp.4 G2	Exp.5 G3	Exp.6 G1
12-13	Exp.4 G3	Exp.5 G1	Exp.6 G2