清華大學物理系　實驗物理 Fall, 2018

課程概述與目標：

本課程以力學、基礎電磁學、進階力學及實驗為主，每週實驗四小時以上，
含各實驗單元的原理介紹與操作，及實驗預習及結果報告繳交。

本教學目標主要如下：

1. 利用簡單的實驗儀器、與實驗模擬，分析軟體，驗證物理定律。
2. 熟悉基本儀器之特性與使用方法與數據的分析，以利將來從事更精密物理實驗
與研究。
3. 培養獨立自主的研究精神，對於實驗種種因素所產生的實驗誤差及提升問題解
決能力。
4. 學習使用電腦程式設計，模擬物理實驗及分析數據。

This is a one semester course intended to give students an introduction to basic laboratory and laboratory soft-ware techniques in the context of classical mechanics and electromagnetism. The course consists of a 4-hour lecture/lab-period per week. This is a hands-on class. You will have one lab partner for each experiment.

The primary goal of the course is to introduce students to basic concepts in experimental physics including:

- ➢ acquire basic concepts related to the experiments
- ➢ learn how to make reliable measurements
- ➢ understand standard measurement techniques for several physical properties.
- ➢ choose the appropriate instruments and measurement techniques for a given measurement task.
- ➢ Using computer programming to simulate experiment and perform analysis of data
- ➢ Practice writing laboratory reports
- ➢ learn how to approach an experiment systematically.

成績計算方式為預報，結報 50%，上課情況、實驗工作簿 20%，期末小專題成果與報告 30%。

實驗物理　實驗課程表　2018.9-2019.1

週次	日期	組別/實驗名稱			
		1-4 組	5-8 組	9-12 組	13-16 組
1	9/10[一] 9/11[二] 9/15[五]	課程說明，分組，MATLAB 程式安裝			
2	9/19[一] 9/20[二] 9/23[五]	Exp. A1	Exp. A2	Exp. A3	Exp. A4

3	9/24[一]中秋節 9/25[二] 9/28[五]教師節	改在 1/5（六）			
4	10/1[一] 10/2[二] 10/5[五]	Exp. A2	Exp. A3	Exp. A4	Exp. A1
5	10/8[一] 10/9[二] 10/12[五]	Exp. A3	Exp. A4	Exp. A1	Exp. A2
6	10/15[一] 10/16[二] 10/19[五]	Exp. A4	Exp. A1	Exp. A2	Exp. A3
7	10/22[一] 10/23[二] 10/26[五]	Exp. B1	Exp. B2	Exp. B3	Exp. B4
8	10/29[一] 10/30[二] 11/2[五]	Exp. B2	Exp. B3	Exp. B4	Exp. B1
9	11/5[一] 11/6[二] 11/9[五]	Exp. B3	Exp. B4	Exp. B1	Exp. B2
10	11/12[一] 11/13[二] 11/16[五]	Exp. B4	Exp. B1	Exp. B2	Exp. B3
11	11/19[一] 11/20[二] 11/23[五]	MATLAB programming I			
12	11/26[一] 11/27[二] 11/30[五]	MATLAB programming II			
13	12/3[一] 12/4[二] 12/7[五]	MATLAB programming III			
14	12/10[一] 12/11[二] 12/14[五]	Physics experiment simulation with MATLAB I			
15	12/17[一] 12/18[二] 12/21[五]	Physics experiment simulation with MATLAB II			
16	12/17[一] 12/18[二] 12/21[五]	Physics experiment simulation with MATLAB III			
17	12/31[一] 1/1 [二] 1/4 [五]	MATLAB project presentations			
18	1/5 [六]				

A1　重力常數測定(9)　A2 法拉第定律與地磁測量　A3 力學振盪(7) A4 磁力、磁矩測量

B1 力學耦合振盪(12)　B2 磁滯現象(5)　B3 非線性振盪(27)　　B4 微波光學(29)