

Syllabus for PHYS 4AL Laboratory for Mechanics and Wave Motion (31844)

(updated on 1/11/2012)

Spring 2012

California State University, Fresno

Course Information

Units: 1

Time: Wed 6:00 pm – 8:50 pm

Location: McLane Hall 264

Course Website:

Please use "Black Board"
<http://blackboard.csufresno.edu>

Instructor Name: Dr. Pei-Chun Ho

Office Number: McLane Hall 254

E-Mail: pcho@csufresno.edu

Telephone: 559-278-5990

Office Hours:

M, W, F: 12:00 PM — 1:00 PM
Tu & Thur: 8:15 PM — 9:15 PM

Course Description

This one unit course will introduce the experiments associated with fundamentals of Newtonian mechanics, the physics of fluids, and development of simple harmonic oscillations, which students learn from PHYS 4A.

Course Format

This course will include assigned readings in your lab manual that should be completed "before" each lab. Prelab activities have to be completed and turned in to instructor before each session starts. During the lab session there will be a short lecture, a quiz, small demonstration how to set up apparatus, and experiments and data analysis actually performed by students.

Corequisite with PHYS 4A

Prerequisite required by PHYS 4A

Math 75 (definitely taken in previous semesters): inequalities, functions, graphs, limits, continuity, differential calculus, introductory integral calculus, and applications.

Math 76 (either in previous semesters or concurrently): integral calculus, coordinate systems, sequences and series, and applications.

Students are expected to be proficient in high school algebra, geometry, and trigonometry.

What You Will Need to Purchase for this Course

PHYS 4A Laboratory Manual from the University Bookstore

Lab Reports and Quizzes

Lab Reports

Prelab-Activity Requirement

Upon agreement of all PHYS 4AL lab instructors, "starting from Lab#2 Vector Additio , students must turn in prelab questions to instructor right before each session starts, otherwise the experiment will not allowed to perform for the students who did not turn in prelab questions."

If a student wants to keep the formula or introduction for prelab activities, instead of tearing the pages down, he/she may make a copy of the pages of prelab questions, write on the copied pages, and turn those in, write neatly and label each questions well on notepapers.

Standard Format of Scientific Report for PHYS 4AL

Official coversheet of the lab report, which can be downloaded from "Course Document" from "Black Board"

- (0) Prelab Activities:
Answering the prelab questions in 4AL lab manual (detail explanation and calculation procedures are required). They must be turned in class right before each session starts)
- (I) Introduction:
Background of the experiment and the motivation
- (II) Experimental Results, Analysis, and Discussion
Collected Data, Graphs of the Data
Data analysis, Graphs of the analyzed Data
- (III) Questions
Answering the questions in 4AL lab manual in a concise and organized way (detail explanation and calculation procedures are required).
- (IV) Summary or Conclusion (in an objective, logical, and scientific manner)

How a lab report will be graded?

Grade of a lab report will be determined base on the following criteria:

Pre-Lab Activity	4/20
Data Collection and Reporting	4/20
Data Analysis (calculations and graphs)	5/20
Questions	4/20
Organization, Legibility, and Written conclusion	3/20

- ◆ All data must have the signature of a lab instructor.
- ◆ Each report must have a cover sheet attached, which you can download from Black Board.
- ◆ All reports must be turned in the same day of the lab. However, if you cannot finish the report in the lab and have to turn in late, the report has to be typeset and be turned in by noon (i.e. 12 PM) of the Friday of the same week to Dr. Ho 's Mail box at Physics Department.
- ◆ Students are allowed to drop one worst grade of the lab reports.

Quizzes

At least six quizzes will be given randomly during the semester: The lowest of the quiz scores will be dropped from grade calculation.

There will be two questions for each quiz, and will be written questions, which require procedures. Questions are based on prelab activities from either previous or current lab, and questions from previous lab reports.

Quiz will be offered after course instruction and will need to be completed within 15 mins. *No additional time will be allowed for those arriving late for the quiz.*

Policy about Quizzes

Either early or make-up quizzes will not be allowed by the instructor. If a quiz is missed for a compelling reason (e.g. illness documented by a physician's official letter with clinic's letter head), the part of the grade that quiz would have counted will be voided, and the rest of the grade will be counted as 100%.

Study Expectations

Attendance to the lab is mandatory. If a student misses more than 2 labs, he/she will automatically fail the course. Each student will submit one's own lab report at the end of each lab although a student will work in groups of 2-4 people (ideally 3 people). Students may not use any data or reports from other lab sessions or years or copy data from lab mates, which are not taken by the student's participation. If one does so, his/(her) behavior will be considered as cheating and

plagiarism. Anyone caught cheating and plagiarism will be dealt with in accordance to the Policies and Regulations as spelled out in 2009-2010 University Catalog, <http://www.csufresno.edu/catoffice/current/policies.html>.

Free Physics tutoring in is offered in the Department of Physics, please contact Physics Office for detail schedule (TEL: 278-2371). In addition, there is also free tutoring provided by the Learning Center in the Peters Building Annex Trailers (TEL: 278-3052 or visit www.csufresno.edu/learningcenter).

Grading (100%)

Reports: 70%
Quizzes 30 % (No final exam)

- ◆ You are allowed to be waived “one” worst grade from lab reports and “one” from the quizzes for the final average.
- ◆ Grade will “not” be curved.
- ◆ **If you miss more than 2 labs you will automatically fail the course.**

Final letter grade

Final letter grade will be assigned on a 100 point scale as follows:

A	100.00 - 90.00		B	89.99 - 80.00
C	79.99-70.00		D	69.99 - 60.00
F	59.99- 0.00			

Course Goals and Primary Learning Outcomes

Course Goals

The main goal of the laboratory course will be to assist students in learning to describe, analyze, and predict the motions of objects that are large relative to atoms and moves at speed much slower than the speed of light by using Newtonian Laws. From actually performing the experiments and analyzing the data, students will be able to associate physics concepts with real world and understand the application of the physics laws they learn in lectures.

Primary Learning Outcomes:

- Students will be able to analyze one-, two-, and three-dimensional linear and rotational motions of objects by using kinematic equations.
- Students will be able to describe and analyze motions by using pictorial, tabular, graphical, and mathematical representations on an object’s position, velocity, acceleration, and mechanical energy.
- Students will be able to apply Newton’s three laws and free-body diagram to analyze the net external force on an object and the resulting motion.
- Students will be able to apply conservation laws in Physics to simply analysis of motions.
- Students will be able to associate mechanical laws with nature phenomena, such as various linear and rotational motions, spring motion, mechanical energy conservation or dissipation, and simple harmonic motion.
- Students will be able to write a formal scientific report, which will benefit their future careers.

Course Policies & Safety Issues

Laboratory Behavior

Both the instructor and the students are to adhere to high standards of professionalism, common courtesy, and respect for others. Please refrain from the following behaviors, bearing in mind that if your behavior interrupts the class you may be asked to leave the class for the rest of the period:

- Coming to lab session late is not tolerable (no later than 5 minutes after a session starts). If you must leave early, please get instructor's signature on data sheets, otherwise the collected data will not count.
- Using cellular phones in class. Please turn off your phone before class.
- Disruptive behavior. This includes talking to others, reading newspapers, etc. Please be ready to attend to the subject of the class; if you are not motivated to learn please do not come and distract those who are motivated.
- Talking out of turn during laboratory instruction period. This can be rude and disruptive. However, I am very interested in what you have to say, and will be happy to entertain questions and comments if you wait your turn.
- Speaking to anyone in a rude or aggressive fashion, or speaking of others in a disrespectful fashion.

University Policies

http://www.csufresno.edu/academics/policies_forms/instruction/RequiredSyllabusPolicyStatements.htm

Students with Disabilities

Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in University Center Room 5 (278-2811).

Honor Code

"Members of the CSU Fresno academic community adhere to principles of academic integrity and mutual respect while engaged in university work and related activities." You should:

- understand or seek clarification about expectations for academic integrity in this course (including no cheating, plagiarism and inappropriate collaboration)
- neither give nor receive unauthorized aid on examinations or other course work that is used by the instructor as the basis of grading.
- take responsibility to monitor academic dishonesty in any form and to report it to the instructor or other appropriate official for action.

Instructors may require students to sign a statement at the end of all exams and assignments that "I have done my own work and have neither given nor received unauthorized assistance on this work." If you are going to use this statement, include it here.

Cheating and Plagiarism

"Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one's own work." Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the university. For more information on the University's policy regarding cheating and plagiarism, refer to the Class Schedule (Legal Notices on Cheating and Plagiarism) or the University Catalog (Policies and Regulations).

Computers

"At California State University, Fresno, computers and communications links to remote resources are recognized as being integral to the education and research experience. Every student is required to have his/her own computer or have other personal access to a workstation (including a modem and a printer) with all the recommended software. The minimum and recommended standards for the workstations and software, which may vary by academic major, are updated periodically and are available from Information Technology Services (<http://www.csufresno.edu/ITS/>) or the University

Bookstore. In the curriculum and class assignments, students are presumed to have 24-hour access to a computer workstation and the necessary communication links to the University's information resources."

Disruptive Classroom Behavior

"The classroom is a special environment in which students and faculty come together to promote learning and growth. It is essential to this learning environment that respect for the rights of others seeking to learn, respect for the professionalism of the instructor, and the general goals of academic freedom are maintained. ... Differences of viewpoint or concerns should be expressed in terms which are supportive of the learning process, creating an environment in which students and faculty may learn to reason with clarity and compassion, to share of themselves without losing their identities, and to develop and understanding of the community in which they live . . . Student conduct, which disrupts the learning process, shall not be tolerated and may lead to disciplinary action and/or removal from class."

Copyright policy

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<http://www.csufresno.edu/library/libraryinformation/campus/copyright/copyrtpolicyfull.pdf>

For copyright Questions & Answers:

<http://www.csufresno.edu/library/libraryinformation/campus/copyright/faqcopyright.pdf>

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(Detail lab schedule listed in the next page)

PHYS 4A Lab Schedule for Spring, 2012

First 15-20 minutes will be a short introduction and a demonstration of the lab. But if there is a quiz, it will be proceed before the instruction. Please be on time, no make-up quizzes are allowed.

Week	Wed.	Topic of the lab
1	1/18	General rules the lab manual must be purchased in the University Bookstore before Lab 0. Read through course syllabus and lab manual's page 1-4 for general rules in the lab. Study Section "Making Measurements" on page 15-19
2	1/25	Lab 1: Introduction to Measurements (Study "Section: Data Analysis" on page 4-14. Prelab Activity in Section "Making Measurements" on page 15-19 must be done before you come to Lab 1)
3	2/1	Lab 2: Vector Addition
4	2/8	Lab 3: Introduction to Motion Quiz 1 coverage: Lab 1 Introduction to Measurements
5	2/15	Lab 4: Acceleration (a) due to Gravity (g)
6	2/22	Lab 5: Projectile Motion Quiz 2 coverage: Lab 2 Vector Addition and Lab 3 Introduction to Motion
7	2/29	No PHYS 4A Lab on Wednesday!!!
8	3/7	Lab 6: Newton's Second Law of Motion
9	3/14	Lab 7: Centripetal Acceleration Quiz 3 coverage: Lab 4 a due to g Lab 5 Projectile motion
10	3/21	Lab 8: Energy (E), Work (W), and Power (P)
11	3/28	Lab 9: Conservation of Linear Momentum (p) Quiz 4 coverage: Lab 6 Newton's 2 nd Law of Motion Lab 7 Centripetal Acceleration
12	4/4	No Lab!!! (Spring Recess)
13	4/11	Lab 10: Torque (τ), Angular Acceleration (α), and Moment of Inertia (I)
14	4/18	Lab 11: Forces (F) and Torques (τ) in Equilibrium Quiz 5 coverage: Lab 8 E, W, and P Lab 9 Conservation of p
15	4/25	Lab 12: Simple Harmonic Motion (SHM)
16	5/2	Lab 13: Archimedes' Principle: Buoyancy and Specific Gravity Quiz 6 coverage: Lab 10 τ , α , and I Lab 11 F and τ in Equilibrium
17	5/9	No Lab!!! (Last Day of Instruction)
18	5/16	No Lab!!! (Finals' Week)