

Syllabus for PHYS 175TS

Service Learning Course-Physics Outreach

Spring 2011

California State University, Fresno

Course Information

Units: 4

Instructors Name:

Assistant Professor: Pei-Chun Ho
Lecturer: Don Williams

Office Number:

McLane Hall 254 (Dr. Ho)

McLane Hall 126 B (Mr. Williams)

Tentative Weekly Schedule:

Lecture hours: Thur. 8:00 – 9:50 AM

Service-learning activity hours:

Fri. 8:00 AM – 1:30 PM

E-Mail: pcho@csufresno.edu (Dr. Ho)

dwilliams@csufresno.edu (Mr. Williams)

Location:

Lecture: McLane 173A

Lab: McLane 167

Telephone: 559-278-5990 (Dr. Ho)

559-278-1434 (Mr. Williams)

Course Website:

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

Office Hours:

Dr. Ho
Mon.-Wed. 12:00PM-1:00PM
Tue., Thur. 8:15 PM-9:15PM
Mr. Williams
Mon., Wed.: 1:00PM-2:00PM
Thur.: 11:00AM-1:00PM

Course Description

This four unit service-learning course will provide science majors in any discipline a hands-on experience teaching and demonstrating science concepts to students in elementary schools to high schools. The course will consist of two lecture hours per week, and four-six hours of physics-outreach (service-learning) activity per week. The lecture will cover the topics and the associated science education demonstrations. The service-learning activity will have the students perform the demonstrations in the local K-12 schools to stimulate young students knowledge of and interest in science.

Enhanced Description

This course was designed after a successful physics outreach program that has been operating for the last two semesters. This course will engage service-learning students in presenting fun demonstrations and easily understandable physics concepts to the youth, from elementary to high schools. Through service-learning students will learn effective, safe and appropriate teaching techniques in an actual classroom setting. Thus, this course will help train the next generation of science educators. In addition, it will promote community interest in physics, and other STEM (science, technology, engineering, and mathematics) courses.

Service-learning is a method where students learn by active participation in organized service that addresses community needs and is linked to academic study through structured reflection. The community needs may include direct service to people in need, improvement of community resources,

applied research, community outreach and education, or policy analysis and advocacy. The academic study may be in any discipline or combination of fields.

Course Goals and Primary Learning Outcomes

Course Goals

The main goal of the service-learning course will be to assist students in learning to describe the basic laws in Newtonian mechanics, electromagnetism, and thermal physics in precise, concise, and simple languages to educate the general public. From actually performing oral presentations and doing demonstrations, students in this service-learning course will be able to associate physics concepts with real world issues and understand the application of the physics laws they learn in lectures. In this process, the service-learning students can also stimulate the K-12 students' interest in physical science.

Primary Learning Outcomes:

- Students will develop professional skills and contacts, deepening their understanding of the material they learn in the classroom through service.
- Students will be able to explain science concepts in simple and concise ways that help to stimulate the interest, and help the general public overcome their fear of physics.
- Students will be able to develop and expand their skills of thinking critically, writing, listening, evaluating, speaking, explaining physics concepts.
- Students will become more efficient and exuberant educators.
- Students will develop a civic ethic and come to understand the importance of participating in service to their local communities.

Prerequisite :

PHYS 4A and PHYS 4B for Physical Science and Engineering majors, PHYS 2A and PHYS 2B for health science, life science, and natural science majors.

What You Will Need for this Course

1. An email and internet account at CSU-Fresno: available for fee at <http://www.fresno.com/cvonline/cvip.html>
2. Either one of the text books of (1) Physics for Scientists and Engineers by Serway and Jewett, (2) College Physics by Serway and Faughn, (3) College Physics by Giordano, or (4) Essential College Physics by Rex and Wolfson.
3. A Laptop, which is required to bring to each class
4. Computer software such as Microsoft Word, Power Point Presentation, and ETS Criterion.

Course Expectations

Attendance to the physics outreach activities is mandatory. If a student misses more than 1 outreach activity, he/she will automatically fail the course. Each student will submit one's own outreach report at the end of each outreach activity.

Students are required to scheduled appointments with the K-12 schools where they are going to do service-learning activities at.

Assignments, Presentations, and Reports

1. **Attendance and participation**
2. **Assignments:**
 - Written Report - Critical Analysis/Reflection:

- A one-page (~ 300 words) report as a WORD document (doc or docx files), margin 1" around with font style Time New Roman size 12, line spacing 1.5 lines. A template is available on Black Board's "Course Document": 175TSReport_Template.doc
 - Service-learning student's critical analysis of the presentation/demonstration, including (i) location of the service-learning activity, (ii) description of the general ethnicity and gender of the audience, (iii) discussion and debriefing about the service-learning activity, (iv) reflection on the service experience, (v) ideas for improving future presentations, and (vi) questions asked by the audience during the service-learning activity, along with the correct response to those questions.
 - Each student must use ETS Criterion to check the writing.
3. **Power point presentations:** each student need to create a 3-5 slides Power Point presentation for a physics demonstration covered in each lecture, which will be posted on the physics web site for public use.
 4. **Final project:** Each student needs to select one physics topic and create a corresponding demonstration from scratch (including equipment). Each student must create and present a Power Point presentation for their constructed demonstration. An operation manual for their demonstration equipment will also be required.
 5. **Student Participation in Classroom Demonstrations:** During the first 6 classroom demonstrations, students will assist the instructors. In the last 5 presentations, students are required to perform all the demonstrations on their own. Between preparing for, assisting with and running the classroom presentations, students will be involved in a minimum of 44 hours of service-learning activity.

Grading (100%)

Attendance and participation	10%
Assignments:	20%
Power point presentations	20%
Final project	20%
Student Participation in the Classroom Demonstrations (service)	30%

- ◆ Grade will "not" be curved.

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		

Safety Issues

Any equipment not handled properly will be potentially harmful to the demonstrators and audience.

- No open toe shoes.
- Handling of cryogenic fluids, such as liquid nitrogen and liquid helium, will require safety goggles and insulated gloved.
- No food. Only bottled beverages, which can be sealed, are allowed.

Course 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 and the service learning activity you will be asked to leave for the rest of the period:

- Coming to class session and service learning activities late is not tolerable. If you must leave early, please get instructor's permission.
- Using cellular phones in class and service learning activities is not allowed. Please turn off your phone before class and service learning activities.
- 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. This is included in service learning activities.
- Talking out of turn during the instruction or service learning period. This can be rude and disruptive.
- Do not speak to anyone in a rude or aggressive fashion, or speak 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 (559-278-2811).

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)

Physics Outreach Schedule:

Week	Th. –Fri.	Topic
1	1/20-1/21	Introduction to service learning, general rules, and contact potential schools for service-learning activities.
2	1/27-1/28	Topic: Force and pressure, atmosphere pressure, and bed and nails Service-Learning Activity: Student Assisted Physics Outreach 1
3	2/3-2/4	Topic: Fluid dynamics and Bernoulli's principle Service-Learning Activity: Student Assisted Physics Outreach 2
4	2/10-2/11	Topic: Linear motion, conservation of linear momentum Service-Learning Activity: Student Assisted Physics Outreach 3
5	2/17-2/18	Topic: Rotational motion and conservation of angular momentum Service-Learning Activity: Student Assisted Physics Outreach 4
6	2/24-2/25	Topic: Constructing and preparing demonstration equipment Service-Learning Activity: Student Assisted Physics Outreach 5
7	3/3-3/4	Topic: Thermal physics and thermoelectric materials Service-Learning Activity: Student Assisted Physics Outreach 6
8	3/10-3/11	Topic: Electromagnetic induction Service-Learning Activity: Student Presented Physics Outreach 1
9	3/17-3/18	Topic: Static electricity and induced electric dipoles Service-Learning Activity: Student Presented Physics Outreach 2
10	3/24-3/25	No Class!!! No Outreach Activity!!!
11	3/31-4/1	No Class on Cesar Chavez Day!!! Service-Learning Activity: Student Presented Physics Outreach 3
12	4/7-4/8	Topic: Rotational dynamics, torques, leverage Service-Learning Activity: Student Presented Physics Outreach 4
13	4/14-4/15	Topic: Magnetism Service-Learning Activity: Student Presented Physics Outreach 5 Vintage-Day Presentation at Science Museum
14	4/21-22	Spring Recess
15	4/28-4/29	Topic: Superconductivity and magnetic levitation Constructing and preparing demonstration equipment
16	5/5 5/6	Final Presentation

**Suggested List of Local Schools for
Service-Learning Course - Physics Outreach**

Ahwahnee Middle, 1127 E. Escalon Ave, Fresno, CA 93710
(559) 451-4300 Principal: [Lisa DeLeon](#), Vice Principal: [Jose Reyes](#),
Office Manager: [Laurie Murphy](#)

Berenda Elementary, 26820 Club Drive, Madera, CA 93638
(559) 674-3325 Teacher: Mr. Charleston
<http://www.madera.k12.ca.us/berenda/site/default.asp>

Carver Academy, 2463 Martin Luther King Blvd, Fresno, CA 93706
(559) 457-2620 Principal: [Stephen Morris](#), Vice Principal: [Ron Steele](#)
Vice Principal: [Michael Cook](#),
Guidance Learning Counselor: [Stacy Swartout-Mc Kinnon](#)

Clark Intermediate School, 902 Fifth Street, Clovis, CA 93612
(559) 327-1500 Principal: Scott Steele

Hoover High, 5550 N. First Street, Fresno, CA 93710
(559) 451-4000 Principal: [Toby Wait](#)

Lowell Elementary, 171 N. Poplar Ave., Fresno, CA 93701
(559) 457-3020 Principal: [Miguel Naranjo](#)

Manchester Gate, 2307 E. Dakota, Fresno, CA 93726
(559) 248-7220 Principal: [Russ Painter](#)

Red Bank Elementary, 1454 Locan, Clovis, CA 93619
(559) 327-7800 Principal: [Kevin Peterson](#)

Redwood High School, 1001 W Main St Visalia CA 93291
(559) 730-7701 Principal: Todd Oto

Roosevelt High, 4250 E. Tulare Street, Fresno, CA 93702
(559) 253-5200 Principal: [Bryan Wells](#)

Wawona Middle, 4524 N. Thorne Ave, Fresno, CA 93704
(559) 248-7310 8th Grade Teacher Mr. Scott Arndt

Webster Elementary, 2600 E. Tyler, Fresno, CA 93701
(559) 457-3430 Vice Principal: [Diane Coakley](#)

Wolters Elementary, 5174 N. First St., Fresno, CA 93710
(559) 248-7340 Principal: [Debra Hawkins](#), Vice Principal: [Phyllis Grossman](#)
Office Manager: [Phyllis Higdon](#)

Yosemite Middle, 1292 N. Ninth Street, Fresno, CA 93703
(559) 457-3450 Principal: [Kathy Hannah-Chambas](#)

Kermit Koontz Education Complex, 1320 N. Mariposa, Fresno, CA 93703
Principal: Nick Hustedde, Email: hhustedde@fcoe.org