

### General Education Course Proposal

Proposed Course: Phys 4A Mechanics and Wave Motion Units 3  
Prefix No. Title

Department: PHYSICS School: NATURAL SCIENCES

**GE Category (Indicate one category only):**

Foundation: A1 \_\_\_; A2 \_\_\_; A3 \_\_\_; B4 \_\_\_  
Breadth: B1 X; B2 \_\_\_; C1 \_\_\_; C2 \_\_\_; D \_\_\_; E \_\_\_  
Integration: B \_\_\_; C \_\_\_; D \_\_\_; International/Multicultural \_\_\_

Existing Course X; Revised Course \_\_\_; New Course \_\_\_

Course Included in Current GE Program X

New courses require the Undergraduate Course Proposal form in addition to this form.  
Revised courses require the Undergraduate Course Change Request in addition to this form.

**Proposed catalog description:** Limit course description to 40 words using succinct phrases. Include prerequisites, limitations, lecture/lab hours. Indicate former course number, e.g., (Former Biol 105)

Prerequisite: Math 76 or concurrently. topics in classical Newtonian mechanics including linear and circular motion; energy; linear and angular momentum; systems of particles; rigid body motion; wave motion and sound.

**Enrollment limit per section:** classroom limited

**Expected number of sections per semester** – Year 1 1 or 2; Year 3 1 or 2

**Attachments:**

1. A statement presenting the ways in which this course meets the Specifications provided in the appropriate section of the General Education Policy as well as in the Policies for Inclusion and Evaluation of General Education Courses.
2. A statement of elements common to all sections of this course, identifying content, objectives, required student activities, grading policy, representative texts, and an approximate schedule for the course. Required student activities include such things as papers, research projects, homework, laboratory and/or studio performance, recitations, participation, attendance, and exams.
3. A typical syllabus for a particular offering of the course.
4. Any special cost factors associated with this course.

**Approval for Inclusion in General Education**

<u>M. J. Zuder</u> Department Chair	<u>3/4/98</u> Date	<u>[Signature]</u> School Curriculum Committee	<u>3/13/98</u> Date
<u>[Signature]</u> School Dean	<u>3/13/98</u> Date	<u>[Signature]</u> General Education Subcommittee	<u>12/15/98</u> Date
<u>[Signature]</u> Associate Provost	<u>12/22/98</u> Date		

1/14/98

## ATTACHMENT 2: PHYSICS 4A

Elements common to all sections of Phys 4A include:

- 1) Calculus-based description and analysis.
- 2) All sections cover the topics indicated in the attached listing: Newtonian kinematics and dynamics of point particles; work, energy, and conservation of energy; impulse, momentum and conservation of momentum; kinematics and dynamics of rigid bodies; static equilibrium; gravity; circular and oscillatory motion; fluid statics and dynamics; waves and sound.
- 3) Objectives. Attachment 1 identifies the goals and objectives of Phys 4A.
- 4) Required student activities. All students are expected to turn in homework assignments as specified in the course syllabus. In addition to the usual comprehensive final examination, they take four lesser examinations during the semester. For those students taking the Physics 4A Laboratory, all experiments are identical for all sections, with students usually working in groups of three or four and turning in individual laboratory reports for each experiment.
- 5) Textbook: All sections currently use Physics For Scientists And Engineers by R. A. Serway (Saunders College Publishing, 1996).

# PHYSICS 4A - PRINCIPLES OF PHYSICS I

Syllabus - Spring 1998 (#25270)

Instructor: Carlos Figueroa  
Office: Science-248, Ext. 8-2523  
Home: 437-9427  
E-mail: carlosf@csufresno.edu  
Office Hours: 0910-1100 Tues. and Wed.  
and 0910-1000 Thursday

Class: 1310-1400 MWF  
Classroom: McL162  
Textbook: Physics For Scientists  
and Engineers by Serway  
(4th edition)

**Problems Sets:** Specific problems from the text will be assigned and collected weekly. Some of the course content will be introduced via the problems and students will be responsible for this material. Make certain your work is legible. Assignments should be placed on the instructor's desk before class begins on the due date. No late assignments will be accepted so hand in what you have completed. If you cannot attend class, arrange to have a friend turn in your homework. Use 8.5"x11" paper. Write your name and the problems assigned on the label.

**Examinations:** There will be four one-hour exams during the semester and a two hour comprehensive final exam. Seat numbers will be assigned. A written excuse (medical, legal, etc.) must be provided if an exam is missed -- preferably prior to the exam. A make-up exam must be completed within one week of the original exam. No "special work" will be assigned to raise test scores.

**Quizzes:** There will be a weekly quiz (Friday) at the beginning of class. It will cover a core idea of the homework. There will be no make-up quizzes.

## COURSE GRADE

a) Four exams during the semester (10% each)	40%
b) Homework.	25%
c) Final comprehensive exam	20%
d) Quizzes	<u>15%</u>
	100%

**Grades:** The "I" grade is given only when a student fails to complete a portion of the required course work and when he/she has completed at least 2/3 of the required work at a passing level. When completing an incomplete, the student does only the unfinished work.

## ***Physics 4A - Topical Outline***

Week Beginning:	1/26 (First Week)
1. Monday	Units and Measurement
2. Wednesday	Units and Measurement
3. Friday	One Dimensional Motion
Week Beginning:	2/2 (Second Week)
1. Monday	One Dimensional Motion
2. Wednesday	One Dimensional Motion
3. Friday	Vectors
Week Beginning:	2/9 (Third Week)
1. Monday	Vectors
2. Wednesday	Two Dimensional Motion
3. Friday	Two Dimensional Motion
Week Beginning:	2/16 (Fourth Week)
1. Monday	President's Day - no instruction
2. Wednesday	Two Dimensional Motion
3. Friday	<b><i>EXAM #1</i></b>
Week Beginning:	2/23 (Fifth Week)
1. Monday	Newton's Laws
2. Wednesday	Newton's Laws
3. Friday	Application of Newton's Laws
Week Beginning:	3/2 (Sixth Week)
1. Monday	Application of Newton's Laws
2. Wednesday	Application of Newton's Laws
3. Friday	Work and Energy
Week Beginning:	3/9 (Seventh Week)
1. Monday	Work and Energy
2. Wednesday	Work and Energy
3. Friday	Potential Energy
Week Beginning:	3/16 (Eighth Week)
1. Monday	Conservation of Energy
2. Wednesday	<b><i>EXAM #2</i></b>
3. Friday	Linear Momentum
Week Beginning:	3/23 (Ninth Week)
1. Monday	Collisions
2. Wednesday	Angular Quantities

3. Friday	Moment of inertia, Torque
Week Beginning:	3/30 (Tenth Week)
1. Monday	Conservation of Rotational Energy
2. Wednesday	Vector Cross Product, Angular Momentum
3. Friday	General Rotational Motion
Spring Break:	4/6 - 4/10
Week Beginning:	4/13 (Eleventh Week)
1. Monday	Static Equilibrium
2. Wednesday	Elasticity
3. Friday	<b>EXAM #3</b>
Week Beginning:	4/20 (Twelfth Week)
1. Monday	Oscillatory Motion
2. Wednesday	Oscillatory Motion
3. Friday	The Law of Gravity
Week Beginning:	4/27 (Thirteenth Week)
1. Monday	The Law of Gravity
2. Wednesday	Fluid Mechanics
3. Friday	Fluid Mechanics
Week Beginning:	5/4 (Fourteenth Week)
1. Monday	Wave Motion
2. Wednesday	Wave Motion
3. Friday	Sound Waves
Week Beginning:	5/11 (Fifteenth Week)
1. Monday	Superposition and Standing Waves
2. Wednesday	<b>EXAM #4</b>

**\*\*FINAL EXAM: Monday, May 18 at 1315-1515\*\***