CREDIT COURSE OUTLINE

I. COVER PAGE

(1) PHYS 2B — Number
(2) GENERAL PHYSICS II — Title
(3) 4 — Units

(4)	Lecture / Lab Hours:			(8)Classification:			
	Total Course Hours						
		Total Lec hours:	72.00			Degree applicable:	X
		Total Lab hours:	36.00			Non-degree applicable:	
		Total Contact hours:	108.00			Basic skills:	
	Lec will generate 0 hour(s) outside work.			(9)RC	Fulfills AS/AA degree requirement: (area)		
	Lab will generate 0 hour(s) outside work.					Competence in mathematics	
					General education category:		
(5)	Grading Basis:	Grading Scale Only	X			Area A Natural Sciences	
		Pass/No Pass option			Major:		
		Pass/No Pass only			Certificate of:		
(6)	Advisories: ENGL 1A - READING AND COMPOSITION				Certificate in:		
(7)	Pre-requisites(requires C grade or better): PHYS 2A			(10)CSU		Baccalaureate:	X
	Corequisites:			(11)Repeatable: (A course may be repeated three times)			0

(12) Catalog Description:
The topics covered in this course include electricity, magnetism, light, atomic and nuclear physics.

II. COURSE OUTCOMES:

(Specify the learning skills the student demonstrates through completing the course and link critical thinking skills to specific course content and objectives.)

Upon completion of this course, students will be able to:

III. COURSE OBJECTIVES:

(Specify major objectives in terms of the observable knowledge and/or skills to be attained.)

In the process of completing this course, students will:

A. Perform some of the simpler calculations in the areas of electricity, magnetism, light, and atomic and nuclear physics.
B. Use the appropriate language of physics and mathematics to solve problems in the areas of electricity, magnetism, light, and atomic and nuclear physics.
C. Perform simple physics experiments in the areas of electricity, magnetism, light, and atomic and nuclear physics ;to acquire understanding of more difficult concepts in general physics.
D. Understand and apply basic physics concepts presented in lectures to the completion of problem assignments and lab reports.
E. Employ the scientific method in experiments in physics which yield results consistent with information presented in lectures.

IV. COURSE OUTLINE:

Lecture Content:

A. Electrostatics
1. Coulomb's Law
2. Induced charge
3. Conservation of Charge

B. Electric Field
1. Magnitude concepts and calculations
2. Direction concepts and calculations
3. Superposition principle applications

C. Electric Potential
1. Potential and Potential energy
a. Similarities
b. Differences

D. Capacitance
1. Physical properties and circuit elements
2. Dielectrics

E. Electric Circuits
1. Currents
2. Resistors and Ohm's Law
3. Kirchoff's Rules for circuit analysis
4. Capacitors in series and parallel
5. RC circuits

F. Magnetism
1.Magnets and magnetic fields
2. Currents and magnetic fields
3. E&M forces
4. Solenoids and electromagnets
5. Ampere's Law

G. Electromagnetic Induction
1. Faraday's Law
2. Electric generators
3. Transformers and power transmission
4. Various applications
5. AC circuits and reactance

H. Electromagnetic waves
1. Maxwell's equations
2. EM field production
3. Light as an EM wave
4. Energy, momentum and pressure of EM waves
5. Radio and television, telecommunications

I. Optics
1. Geometric optics
a. mirrors
b. lenses
c. Diffraction
2. Optical instruments
1. Cameras
2. Human eye
3. Telescopes

J. Modern Physics

1. Special Relativity
2. Quantum atomic theory and quantum mechanics
3. Condensed matter
4. Nuclear physics
5. Astrophysics and cosmology

Lab Content:

A. Electric Field and Potential Mapping
B. Electric field interactive simulations
C. Resistive Circuits
D. Measurement and calculation of RC time constant
E. Ampere's, Faraday's and Lenz's Laws
F. Build your own motor
G. EM force and the suspension of a nail
H. EM waves and fields interactive simulations
I. Geometric optics simulations
J. Physical optics simulations
K. Special Relativity
1. Time dilation
2. Length contraction
L. Quantum Atomic simulations
M. Cosmology simulations

V. APPROPRIATE READINGS

Reading assignments may include but are not limited to the following:

A. Sample Text Title:
   1. Recommended - John D. Cutnell, Kenneth W. Johnson *Physics, Laboratory Manual-Student Version,* ed. 6th -, 2004,

B. Other Readings

___ Global or international materials or concepts are appropriately included in this course
___ Multicultural materials and concepts are appropriately included in this course

If either line is checked, write a paragraph indicating specifically how global/international and/or multicultural materials and concepts relate to content outline and/or readings.

VI. METHODS TO MEASURE STUDENT ACHIEVEMENT AND DETERMINE GRADES:

Students in this course will be graded in at least one of the following four categories. Please check those appropriate. A degree applicable course must have a minimum of one response in category A, B, or C.

A. Writing Check either 1 or 2 below			
X	***1. Substantial writing assignments are required. Check the appropriate boxes below and provide a written description in the space provided.***		
	2. Substantial writing assignments are NOT required. If this box is checked leave this section blank. For degree applicable courses you must complete category B and/or C.		
	a) essay exam(s)	X	d) written homework
	b) term or other paper(s)		e) reading reports
X	c) laboratory report(s)	X	f) other (specify)

Required assignments may include but are not limited to the following:
Laboratory reports that require technical writing skills and mathematical computations.

B. Problem Solving Computational or non-computational problem-solving demonstrations, including:			
X	a) exam(s)	X	d) laboratory reports
X	b) quizzes		e) field work
X	c) homework problems		f) other (specify):

Required assignments may include but are not limited to the following:
Homework problems that require mathematical computations, exams that require conceptual understanding and mathematical computations, and laboratory reports that require technical writing and mathematical computations.

Example problem: (1) Find the angle of incidence if the angle of reflection is twice the angle of refraction when a beam of light in air strikes a slab of glass (with n = 1.52) and is partially reflected and partially refracted.

C. Skill demonstrations, including:			
	a) class performance(s)		c) performance exams(s)
	b) field work		d) other (specify)

Required assignments may include but are not limited to the following:

D. Objective examinations including:			
X	a) multiple choice	X	d) completion
X	b) true/false	X	e) other (specify):
X	c) matching items		

COURSE GRADE DETERMINATION:
Description/Explanation: Based on the categories checked in A-D, it is the recommendation of the department that the instructor's grading methods fall within the following departmental guidelines; however, the final method of grading is still at the discretion of the individual instructor. The instructor's syllabus must reflect the criteria by which the student's grade has been determined. (A minimum of five (5) grades must be recorded on the final roster.)

If several methods to measure student achievement are used, indicate here the approximate weight or percentage each has in determining student final grades.
15% Homework 50% Exams 25% Lab Reports 10% Participation

Does Course Require Secial Facilities? Yes: Physics laboratory classroom

Attached Files:

BASIC SKILLS ADVISORIES PAGE The skills listed are those needed for eligibility for English 125, 126, and Math 101. These skills are listed as the outcomes from English 252, 262, and Math 250. In the right hand column, list at least three major basic skills needed at the beginning of the target course and check off the corresponding basic skills listed at the left.

Check the appropriate spaces.
_____ Eligibility for Math 101 is advisory for the target course.
_____ Eligibility for English 126 is advisory for the target course.
_____ Eligibility for English 125 is advisory for the target course.
If the reviewers determine that an advisory or advisories in Basic Skills are all that are necessary for success in the target course, stop here, provide the required signatures, and forward this form to the department chair, the appropriate associate dean, and the curriculum committee.

CONTENT REVIEW
PHYS 2A GENERAL PHYSICS I

REQUISITES	
Subject Prerequisite -- PHYS 2A GENERAL PHYSICS I	
• Vector quantities	• Perform some of the simpler calculations in the areas of electricity, magnetism, light, and atomic and nuclear physics.

ESTABLISHING PREREQUISITES OR COREQUISITES

Every prerequisite or corequisite requires content review plus justification of at least one of the seven kinds below. Prerequisite courses in communication and math outside of their disciplines require justification through statistical evidence. Kinds of justification that may establish a prerequisite are listed below.

Check one of the following that apply. Documentation may be attached.

1. _____ The prerequisite/corequisite is required by law or government regulations.
   Explain or cite regulation numbers:
2. _____ The health or safety of the students in this course requires the prerequisite.
   Justification: Indicate how this is so.
3. _____ The safety or equipment operation skills learned in the prerequisite course are required for the successful or safe completion of this course.
   Justification: Indicate how this is so.
4. _____ The prerequisite is required in order for the course to be accepted for transfer to the UC or CSU systems.
   Justification: Indicate how this is so.
5. _____ Significant statistical evidence indicates that the absence of the prerequisite course is related to unsatisfactory performance in the target course.
   Justification: Cite the statistical evidence from the research.
6. _____ The prerequisite course is part of a sequence of courses within or across a discipline.
7. __X__ Three CSU/UC campuses require an equivalent prerequisite or corequisite for a course equivalent to the target course:
   CSU Fresno, Cal Poly SLO, UC Berkeley