

PHYS 2A Course Outline as of Fall 2001**CATALOG INFORMATION**

Dept and Nbr: PHYS 2A Title: GENERAL PHYS LECT

Full Title: General Physics Lecture

Last Reviewed: 4/22/2019

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	17.5	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

Translational and rotational motion, statics, conservation of momentum and energy, oscillations, mechanical waves and sound, fluid mechanics, heat and thermodynamics. C/B1 (CAN PHYS 2)

Prerequisites/Corequisites:

Math 27 (formerly Math 57) or equivalent with grade of "C" or better and not open to students enrolled in or who have completed Phys 4A or Phys 4B.

Recommended Preparation:

Phys 1 or high school physics.

Limits on Enrollment:**Schedule of Classes Information:**

Description: (Grade or P/NP)

Prerequisites/Corequisites: Math 27 (formerly Math 57) or equivalent with grade of "C" or better and not open to students enrolled in or who have completed Phys 4A or Phys 4B.

Recommended: Phys 1 or high school physics.

Limits on Enrollment:

Transfer Credit: CSU;UC. (CAN PHYS 3A+PHYS 2A=PHYS2)(PHYS 3B+PHYS 3A+PHYS

2B+PHYS 2A=PHYS SEQ A)

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area		Effective:	Inactive:
	C	Natural Sciences	Fall 1981	
CSU GE:	Transfer Area		Effective:	Inactive:
	B1	Physical Science	Fall 1981	
IGETC:	Transfer Area		Effective:	Inactive:
	5A	Physical Sciences	Fall 1981	
CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive: Fall 2021
UC Transfer:	Transferable	Effective:	Fall 1981	Inactive: Fall 2021

CID:	
CID Descriptor:PHYS 100S	Algebra/Trigonometry-Based Physics: AB
SRJC Equivalent Course(s):	PHYS20 AND PHYS20L AND PHYS21 AND PHYS21L OR PHYS20A AND PHYS20B
CID Descriptor:PHYS 105	Algebra/Trigonometry-Based Physics A
SRJC Equivalent Course(s):	PHYS20 AND PHYS20L OR PHYS20A

Certificate/Major Applicable:

Not Certificate/Major Applicable

COURSE CONTENT

Outcomes and Objectives:

Upon completion of the course, the student should be able to:

1. State the SI units for length, time & mass, identify the powers of 10 associated with the most common metric prefixes, & change a quantity from one set of units to another.
2. Explain the difference between scalar & vector quantities & give examples of each.
3. Use vector addition methods to determine the sum of two or more vectors.
4. Define the concepts of velocity & acceleration & explain the difference between average & instantaneous values of velocity & acceleration.
5. Solve problems involving uniformly accelerated motion, including projectile motion.
6. Define the concepts of force & mass, explain the difference between weight & mass, & give the units for force & weight.
7. State Newton's laws of motion & give examples illustrating each.
8. Use Newton's second law to solve problems involving the acceleration of masses with one or more forces (including frictional forces) acting upon them.
9. Define the concepts of work, energy, kinetic energy, potential energy, & power, & give units in which each is expressed.
10. State the principle of conservation of energy, give examples

- illustrating the principle, & use the principle in problem solving (including rotational kinetic energy).
11. Define linear momentum, give units for it, state the principle of conservation of momentum, give examples illustrating the principle, & use the principle in problem solving.
 12. Define torque, give units for it, & compute the torques about a given axis due to a given force.
 13. Explain the concept of center of mass and/or center of gravity; describe the conditions necessary for static equilibrium, & solve problems involving equilibrium.
 14. Explain the concepts of centripetal force & centripetal acceleration, explain the role of centripetal force in uniform circular motion, & use the concepts in solving problems.
 15. Define angular displacement, angular velocity & angular acceleration; give units in which they are expressed; & solve problems involving uniformly accelerated angular motion.
 16. Explain the concepts of rotational inertia & angular momentum, state the principle of conservation of angular momentum, give examples illustrating the principle, & use the principle in problem solving.
 17. Define pressure, give units for pressure, explain the difference between gauge pressure & absolute pressure, calculate the pressure at a given depth in an incompressible fluid.
 18. State Pascal's principle, give examples of its application, & use it to solve problems.
 19. Define buoyant force, state Archimedes' principle, & use it in problem solving.
 20. Give examples which illustrate the application of Bernoulli's equation & use it in problem solving.
 21. Explain what makes a motion simple harmonic motion; define the terms: amplitude, frequency, period; solve problems involving masses on springs & simple pendulums.
 22. Explain what a wave is & define the terms: longitudinal, transverse, frequency, wavelength, & amplitude as they apply to waves.
 23. Demonstrate an understanding of the Doppler effect & solve problems involving the Doppler effect for moving sources & moving observers.
 24. Explain the concept of interference of waves & the production of beats, & calculate beat frequencies.
 25. Explain what resonance is, sketch wave patterns for & solve problems involving standing waves in vibrating strings & air columns.
 26. Give values for the freezing & boiling points of water on the Celsius, Fahrenheit & Kelvin scales, & convert from one temperature scale to another.
 27. Demonstrate an understanding of thermal expansion & the coefficient of thermal expansion, & solve problems involving thermal expansion of solids, liquids, & gases.
 28. Define the concepts of heat, specific heat & latent heat, & use the concepts in problem solving.
 29. List the 3 methods of heat transfer & solve problems involving heat transfer.
 30. List the properties of an ideal gas & solve problems using the ideal gas laws.
 31. Use the kinetic molecular theory to explain the molecular meaning of

absolute temperature & calculate the kinetic energy & speed of gas molecules.

32. State the second law of the thermodynamics, explain what an adiabatic process is, describe the Carnot cycle, & solve problems involving the second law of thermodynamics, Carnot cycle, & efficiency of heat engines.

Topics and Scope:

Topics covered include:

1. Measurement and vectors.
2. Uniformly accelerated motion.
3. Newton's Laws of motion.
4. Work and energy.
5. Momentum.
6. Torque and static equilibrium.
7. Rotational motion.
8. Fluid mechanics.
9. Wave motion and sound.
10. Vibratory motion.
11. Temperature and the gas laws.
12. Thermal energy, thermal expansion, heat transfer.
13. Thermodynamics.

Assignment:

1. No less than twelve sets of homework problems.
2. Zero to fifteen quizzes
3. No less than three mid-term exams
4. Final exam.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.

Writing
0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, Quizzes, Exams

Problem solving
15 - 35%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations
0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, PHYSICS PROBLEMS TO SOLVE

Exams
65 - 85%

Other: Includes any assessment tools that do not logically fit into the above categories.

None

Other Category
0 - 0%

Representative Textbooks and Materials:
Physics by Cutnell & Johnson, 5th edition, Wiley, 2000