PHYS4A Syllabus

Course: #50209

LEC: T, Th: 3:30PM-5:20 PM

LAB: Th: 5:30PM-6:45PM

Instructor: Harinder Singh Bawa

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harinder.bawa@reedleycollege.edu,

Classroom: PHY70

Office Hours: N.A (email me)

Course Objective: The main objective of the course is for the student to understand the laws/theories and principles of Classical Mechanics, properties of matter, gravitation, fluid mechanics, oscillatory motion and mechanical waves.
Students will gain skills in understand the complementary roles of experimental investigation and theoretical explanation in science, apply dimensional analysis to determine the units for an unknown quantity or to check the validity of equations, correctly report the units of an observable when it is measured or calculated and distinguish between important physical observables, such as velocity, acceleration and force.

Basic Skills Advisories: ENG1A

Subject Prerequisites: MATH-5B - Math Analysis II (May be taken concurrently)

Required Course Materials:

Textbook:
Paul P. Urone and Roger Hinrichs, College Physics, Open Stax, Rice University, 2012. (FREE) Download it here. (Also on Canvas)
"Physics for Scientists and Engineers with Modern Physics", Giancoli, 4th edition, Pearson/Prentice Hall Publishers.
You should bring a textbook, scientific calculator (or graphing), pencils, and paper or iPad (for notes) with you every class session.

ATTENDANCE: Students are expected to attend all class meetings, be on time, and be in class the entire class session. Calling me to tell me you will be absent **does not** excuse you. **STUDENTS LEAVING CLASS BEFORE THE END OF CLASS without notifying me WILL BE COUNTED AS BEING ABSENT! Six (6) absences total or three (3) absences in the first three weeks of class** may result in a drop from the course. However, if you decide to drop the course, it is **your**

responsibility to make the drop official in the Administrations and Records office or else possibly receive a grade of **F.**

Behavioral Standards: Your classmates and I would greatly appreciate that students in the class take care of any personal needs (i.e., using the restroom, getting a drink, sharpening a pencil) before class begins. Please turn your phone off when entering the class. You may not use your phone as a calculator. Calculators are provided in class if you don't have one.

TARDIES: Students are expected to be on time. It is distracting, rude and unfair to fellow classmates and to the instructor when a student is late. It is your responsibility to notify the instructor (on a break or after class) that you are present if you arrive after roll has been taken giving valid reason of being late. You would be flagged tardy and if you accommodate three tardies, you would be deducted 5% of the grades.

HOMEWORK: All homework assignments must be turned in to me in-class/Canvas (Wherever specified) on the specified due date. Homework problems will be assigned out of lecture a well as specific worksheets given and your solutions should be **neatly** written on paper. If you are proficient in using the equation editor on Microsoft Word, LaTeX, or other document software, you may type your solutions.

Please use scratch paper to work on the problems but only turn in the solutions to me. Turning in a homework set **without showing work** is not worth any credit! You do not need to re-write the entire problem, but write out the given variables, draw pictures/figures, and list what you're finding to help your thought process. Collaboration on homework sets is fine, but you must turn in your own solutions. Homework will be worth **15%** of your grade and I will drop your lowest homework score.

LAB REPORTS: This class has a laboratory section that is mandatory. I will provide all lab reports for you and they will be due at the end of the lab session on the same day assigned (unless extra time is necessary.) Lab reports will be worth **15%** of your grade. Some lab sessions will be solely dedicated to in-class problem solving. There will not be any opportunities to make up a lab, so I will drop your lowest lab grade.

INCLASS QUIZ: Randomly in class, we would be having in-class quizzes from the topics we covered previously. You may or may not be notified about those quizzes. These quizzes are worth **10**% of your grade.

MidTerm EXAMS: There will be 4 mandatory midterm exams during the semester. There are no makeup exams for missed tests. NO EXCEPTIONS! You may use a 3" x 5" note card (both sides) for your own formula sheet on midterm exams and the final (you may write ANYTHING on here, formulas, practice problems, whatever helps you the most!) Exams will mostly be multiple choice problems and may require 1-3 free response questions. Only scientific calculators may be used. The exams should only take 90 minutes to complete but I will give you 1 hours and 50 minutes. One Lowest midterm exam would be dropped out of 4. The 3 midterm exams counted are worth **45%** (equally weighted, **15%** each) of your grade.

FINAL EXAM: The final exam should only take 90 minutes to complete but I will give you 2 hours and 50 minutes. This exam will be comprehensive, but most of the material will be from the final unit of the class. The final will be worth **15%** of your grade. The final exam can be used to replace your lowest midterm score (except for a "0" due to an absence.)

****Date of Final exam is mentioned on Reedley College Website.**

Weights Summary (% of total points 100):

- Homework: 15%
- Midterm Average: 45%
- In Class Quizzes: 10%
- Lab Reports: 15%
- Final Exam: 15%

*Example Calculation: If an e*xample student has the following grades:

- Homework: 75%
- Midterm Average: 85%
- In Class Quizzes: 100%
- Lab Reports: 95%
- Final Exam: 80%

Their grade is calculated as follows: (Canvas will do this automatically, including drops)

(.15) (75) + (.45) (85) + (.1) (100) + (.15) (95) + (.15) (80) = 85.75%

Percent of Total Points	Grade
89-100	A
78-88.99	B
65-77.99	C
55-64.99	D
0-54.99	F

WHERE TO FIND YOUR GRADE:

I will put your grades on Canvas. You can also calculate it yourself at any time using the method above.

SPECIAL NEEDS REQUESTS: If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.

Tentative schedule:

Week	Important dates	Topics with textbook chapter
1		General Information, rules, and syllabus **Ch. 1 – Measurements and Vectors** 1.1 The Nature of Physics 1.2 Units 1.3 Conversion of Units 1.4 Dimensions of Physical Quantities 1.5 Significant Figures and Order of Magnitudes
2		**Ch. 2 – Motion in 1 Dimension** 2.1 Displacement, Velocity, and Speed 2.2 Acceleration 2.3 Motion with Constant Acceleration 2.4 Integration
3		**Ch. 1** – 1 .6 Vectors 1.7 General Properties of Vectors **Ch. 3 – Motion in 2 and 3 Dimension**s 3.1 Displacement, Velocity, and Acceleration
4	Wednesday Feb 12,2020 Midterm Exam 1 Exam topics: Significant figures, Vectors, and Kinematics(1D/2D)	3.2 Special Case: Projectile Motion 3.3 Special Case: Circular Motion **Ch. 4 – Newton's Laws** 4.1 Newton's 1-st Law: The Law of Inertia 4.2 Force and Inertia 4.3 Newton's 2-nd Law
5		4.4 Force due to Gravity: Weight 4.5 Contact Forces: Solids, Springs, and Strings 4.6 Problem Solving: Free Body Diagrams 4.7 Newton's 3-rd Law 4.8 Problem Solving: Problem with Two or More Objects
6		**Ch. 5 – Additional Applications of Newton's Laws** 5.1 Friction 5.2 Drag Forces (omitted 5.3 Motion Along a Curved Path 5.4 Numerical Integration: Euler's Methods (omitted) 5.5 The Center of Mass
7	W – March 5,2020 Midterm Exam 2 Exam topics: Newton's Laws and its application	**Ch. 6 – Work and Kinetic Energy** 6.1 Work Done by a Constant Force 6.2 Work Done by a Variable Force – Straight Line Motion 6.3 The Scalar Product 6.4 Work – Kinetic Energy Theorem – Curved Paths 6.5 Center of Mass Work

8		**Ch. 7 – Conservation of Energy** 7.1 Potential Energy 7.2 The Conservation of Mechanical Energy 7.3 The Conservation of Energy 7.4 Mass and Energy (omitted) 7.5 Quantization of Energy (omitted)
9		Center of Mass 5.5 The Center of Mass 6.5 Center-of-Mass Work **Ch.8 – Conservation of Linear Momentum** 8.1 Conservation of Linear Momentum 8.2 Kinetic Energy of a System
10	Midterm Exam 3 W – March 20, 2020 Exam topics: Work, Energy, Power, Conservation of energy	**Ch.8 – Conservation of Linear Momentum** 8.3 Collisions
11		**Ch. 9 – Rotational Dynamics** 9.1 Angular Velocity and Angular Acceleration 9.2 Rotational Kinetic Energy 9.3 Calculating the Moment of Inertia
12		9.4 Newton's 2-nd Law for Rotation 9.5 Applications of Newton's 2-nd Law for Rotation
13		**Ch. 10 – Angular Momentum** 10.1 Vector Nature of Rotation 10.2 Torque and Angular Momentum 10.3 Conservation of Angular Momentum 10.4 Quantization of Angular Momentum (omitted)
14	EXAM 4 (TBD) Exam topics: Linear Momentum, Rotational Dynamics	**Ch. 12 – Static Equilibrium and Elasticity** 12.1 Conditions for Equilibrium 12.2 The Center of Gravity
15		12.3 Some Examples of Static Equilibrium 12.5 Stability of Rotational Equilibrium 12.7 Stress and Strain
16		**Ch. 14 – Oscillations (If time permits)** 14.1 Simple Harmonic Motion 14.2 Energy in Simple Harmonic Motion 14.3 Some Oscillating Systems
17		Comprehensive Exam – ALL topics covered in class and other course work.