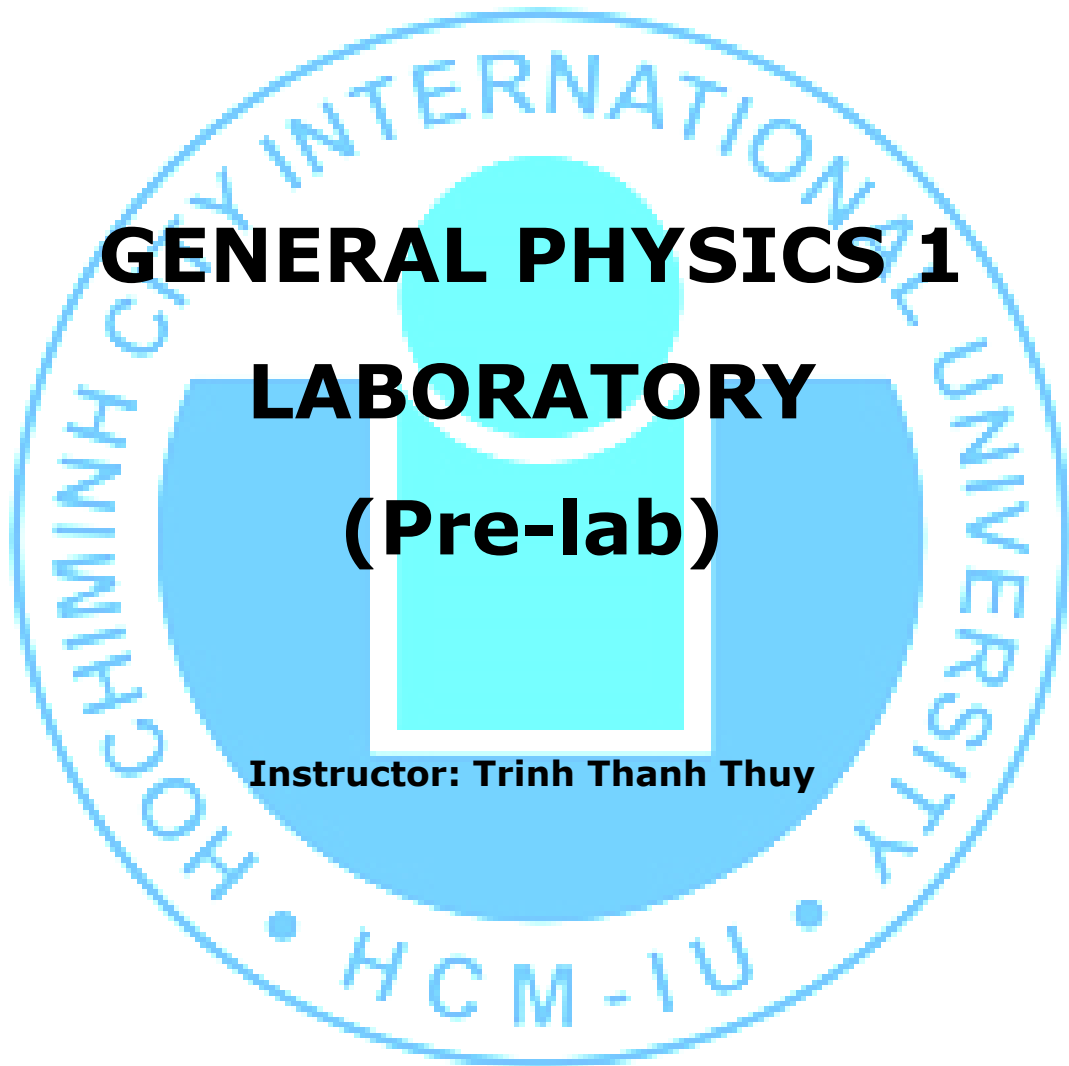


**VIETNAM NATIONAL UNIVERSITY-HCMC
INTERNATIONAL UNIVERSITY**



**GENERAL PHYSICS 1
LABORATORY
(Pre-lab)**

Instructor: Trinh Thanh Thuy

HCMC, September, 2017



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LAB 1 PROJECTILE MOTION

Pre-lab questions

1. Read the theory part in Lab guide. If R and H are measured as indicated in the table, find the time of flight, and the initial launch speed.

Launch angle	Measured R	Measured H	Time of flight	Initial speed
0	2.20 (m)	1.00 (m)		

Now use this speed, to fill out the second table.

Launch angle	measured H	Time of flight	Measured R	Expected R	Ratio (R_M/R_E)
25°	1.00 (m)		3.00 (m)		

2. Read the theory part in Lab guide and name the variable(s) that affect the horizontal range?

3. A body is projected with a velocity of 20 ms^{-1} at 50° to the horizontal. Find:
 - (i) Maximum height reached
 - (ii) Time of flight and
 - (iii) Range of the projectile.



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LAB 2 NEWTON'S LAWS

Pre-lab questions

1. State Newton's First and Second Laws of Motion.
2. Which law states, "the acceleration is inversely proportional to the mass"?
3. What causes acceleration to decrease?
4. What will happen to an object when you apply a net force to it



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LAB 3 CONSERVATION OF MOMENTUM

Pre-lab questions

1. How would you calculate the total momentum for two carts that are about to collide?

2. How will the momentum of two carts *after* they collide compare to the momentum of the two carts *before* the collision?

3. In which type of collision was the before-and-after difference in momentum the least?
In which type of collision was the difference the most?



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LAB 5 ROTATIONAL INERTIA

Pre-lab questions

4. What is the purpose of this experiment?

5. Write down the equations express the rotational inertia of a thick ring and a disk.

6. Two uniform density cylinders, one solid (the larger) and one hollow (the smaller), of equal mass ($M = 3.0$ kg) and differing radii, $R=4.0$ m and $r=2.0$ m, are mounted so that the smaller cylinder is held centered and directly above the larger radius mass. Initially the bottom mass is spinning at 3.0 rad/sec while the top mass is a rest. The top mass is very gently dropped onto the bottom so that it remains centered and, afterwards, they stick such that the two masses rotate at the same angular velocity. What is the final angular velocity of the two masses?



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LAB 6 SLIDING FRICTION

Pre-lab questions

7. What is the purpose of this experiment?
8. What are static frictional force, kinetic frictional force and normal force?
9. What are coefficient of kinetic friction and coefficient of static friction?



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LAB 7 VARIABLE-G PENDULUM

Pre-lab questions

1. What is the difference between simple pendulum and physical pendulum?
2. What is the purpose of this experiment?
3. Write down the equations express the period of a physical pendulum.
4. The moment of inertia I about the pivot point is related to the moment of inertia about the center of mass I_{cm} by the parallel axis theorem, which states $I=I_{cm}+mr^2$ (1) where I_{cm} can be computed by the definition of the moment of inertia. For a uniform bar of length L , $I_{cm} =mL^2/12$. Use eq. (7.1) in here and eq. (7.2) in Lab guide to compute the period T of physical pendulum consisting of a meter stick ($L = 1\text{m}$) with $r = 0.30\text{ m}$ and $\theta = 30^\circ$.

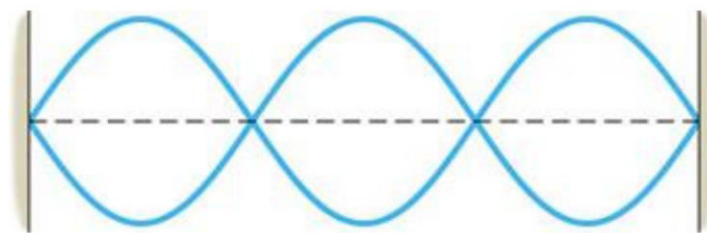
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LAB 8 VIBRATING STRINGS

Pre-lab questions

1. What is standing waves? How to produce the standing wave on a string?
2. What is the purpose of this experiment?
3. Write down the equation expressing the relationship between tension force and the length of the string?
4. Referring to the picture below:



- a) Label all the nodes (N) and antinodes (A) on the diagram.
- b) How many nodes and antinodes are present?
- c) How many wavelengths are present?
- d) If the string is 2.0 m long, what is the wavelength?

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LAB 9 GYROSCOPE

Pre-lab questions

1. Assume that you are sitting at rest on a rotating chair holding a bicycle wheel by the axle. The wheel is vertical, and it is spinning so that the top edge is moving away from you as shown in the picture. What do you think will happen if you turn the bicycle wheel to the left into the horizontal position? What do you think will happen if you turn the wheel back to being vertical?



2. Imagine you are once again sitting at rest on a rotating chair holding a bicycle wheel by the axle. This time the wheel is horizontal and it is spinning. The chair is not rotating. What do you think will happen if you turn the wheel by 180 degrees, so that it is horizontal in the opposite direction? What do you think will happen if you turn the wheel back to its original orientation?



3. What is the purpose of today experiment (gyroscope experiment)?



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LAB 10 BERNOULLI'S PRINCIPLE

Pre-lab questions

1. What is Bernoulli's law? Write down the equation of Bernoulli's law.
2. Which equation represents the relationship between the cross-sectional area and the speed of the fluid? Write its expression down.
3. How does Bernoulli's Equation change if the pressure change is due only to the velocity change?
4. A stream of water flows down a hill. Assuming no losses through friction how does the gravitational potential energy of one kilogram of water at the top of the hill compare with the kinetic energy of the same kilogram of water when it reaches the bottom of the hill?



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LAB 11 IDEAL GAS LAW

Pre-lab questions

1. The volume of a fixed amount of ideal gas is directly proportional to its temperature when the pressure is held constant. Which law is this?
a. Boyle's law b. Charles's law c. Ideal gas law d. State of gas law

2. The pressure of a fixed amount of an ideal gas is inversely proportional to the volume when the temperature is held constant. Which law is this?
a. Boyle's law b. Charles's law c. Ideal gas law d. State of gas law

3. What is the purpose of this experiment?



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LAB 12 GAY-LUSSAC'S LAW

Pre-lab questions

1. What is the purpose of this experiment?

2. Define 'absolute zero'

3. State the Gay-Lussac's law?

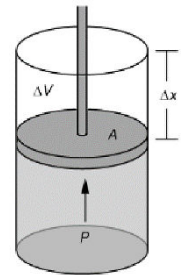
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LAB 13 HEAT ENGINE CYCLES

Pre-lab questions

1. What is the equation for the volume of a cylinder that has an inner diameter of d and a length L ?

2. If a gas expands inside a cylinder with a movable piston so that the volume changes by an amount ΔV while the pressure is kept constant at a value P (isobaric process), what is the mathematical expression to calculate the amount of work done by the gas?



3. What is the purpose of this experiment?



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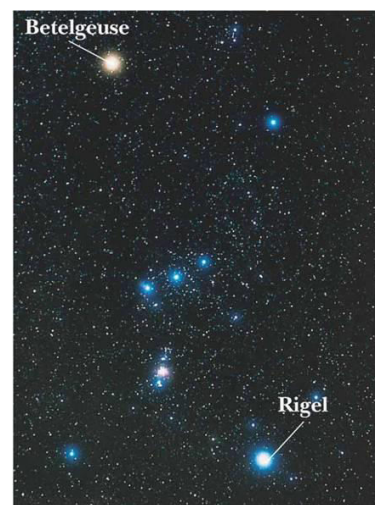
LAB 14 BLACKBODY RADIATION

Pre-lab questions

10. What is blackbody?

11. What is the purpose of this experiment?

12. This figure shows two stars in the constellation Orion. Betelgeuse appears to glow red, while Rigel looks blue in color. Which star has a higher surface temperature? Explain.



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