

Physics 121 – November 6, 2009

Today:

- Homework problems due **Today**
Chap 8, # 13, 19, 20, 25, 29, 49
- Review for Exam 2: topics in **Chapters 6,7,9,10,11**
- No MP Assignment – instead, study for exam on **Monday, Nov 9**. Practice problems will be posted online Nov 7-8.

Revised office hours, this week only:

Wednesday (today) 12:30-2 pm

Friday 10:30-12:00



Clicker question:

A communication satellite and the space shuttle are both in circular orbits about the Earth, but the shuttle orbits at a lower altitude. Which of the following statements is true?

- A. the satellite has a higher speed and a greater total energy.
- B. the shuttle has a higher speed and a greater total energy.
- C. the shuttle has a higher speed and a smaller total energy.
- D. the speeds are equal but the satellite has a greater total energy.

Topics for Exam 2

format: same as exam, 10-12 mult choice, 1-2 numerical

1. Work, kinetic energy, potential energy

Know how to compute work under different circumstances (variable or constant net forces, direction of forces with respect to displacements,...)

Know how to compute and apply the concept of potential energy for different cases.

2. Conservation of energy

Be able to apply the law of conservation of total mechanical energy ($E=K+U=\text{constant}$)

Topics for Exam 2 (cont):

3. Conservation of momentum

Find center of mass. Solve problems using momentum and apply conservation of momentum when there is no external net force.

Know how to calculate the impulse, and use it to find a change in momentum.

4. Collisions

Know the difference between the three kinds of 2-body collisions. Solve collision problems in 1- and 2-dimensions.

Topics for Exam 2 (cont):

5. Rotation

Know how to solve rotation problems using the equations of motion with constant angular acceleration.

Compute rotational inertia for simple masses.
Look up values for various objects.

Rolling motion.

6. Torque

Find torques about an axis (magnitude and direction)

Apply Newton's 2nd law for rotation ($\tau = I\alpha$)

Topics for Exam 2 (cont):

7. Angular Momentum

Apply conservation of angular momentum if the sum of the torques is zero.

8. Rotational energy

Compute rotational kinetic energy.

Apply the law of conservation of total mechanical energy ($E=K+U=\text{constant}$) where $K=\text{translational}+\text{rotational kinetic energy}$.