Physics 121 – October 5, 2017

Announcements:

Midterm on Thursday, Oct 12
Practice Exam (pdf copy) on class website
Office hours change: Thur 2-3, Fri 1-3 pm

Assignments:

This week:

- Finish reading Chapter 7 of textbook; read Chap 8 up to section 8.3 (we'll cover 8.4-8.5 ***after*** the midterm exam)
- Complete ETA Problem Set #7 and Chap 7 written problems #34, 50, 54, 72, and Chap 8- #23, 36, 42
- Quiz in recitation this week plus practice problems in recitation: Chap 7- #29, 51, 60, 76, and Chap 8- #40, 41

Topics to know for this week's quiz:

- Draw a Free Body Diagram (FBD), identifying all forces
- Forces: tension, gravitational, spring, friction, normal
- Components of forces, dealing with off-axis forces (as in ramps, things hanging from ropes, etc.)
- Newton's 2nd law

$$\vec{F} = m\vec{a}\,, \qquad \Sigma F_x = ma_x$$

$$\Sigma F_y = ma_y$$

Topics for today:

- More on work-kinetic energy theorem
- Power
- Potential energy
- Example using potential energy: gravity, springs

Problem-Solving Strategy: Work-Energy Theorem

1. Draw a free-body diagram for each force on the object.
2. Determine whether or not each force does work over the displacement in the diagram. Be sure to keep any positive or negative signs in the work done.
3. Add up the total amount of work done by each force.
4. Set this total work equal to the change in kinetic energy and solve for any unknown parameter.
5. Check your answers. If the object is traveling at a constant speed or zero acceleration, the total work done should be zero and match the change in kinetic energy. If the total work is positive, the object must have sped up or increased kinetic energy. If the total work is negative, the object must have slowed down or decreased kinetic energy.