Physics 121.
Tuesday, February 26, 2008.

Physics 121.
Tuesday, February 26, 2008.

- Course Information
- Quiz
- Topics to be discussed today:
  - Review of Conservation Laws (kinetic energy, potential energy, conservative and non-conservative forces).
  - Dissipative forces.
  - Gravitational potential energy.

Course information.
Exam # 1.

- On Thursday February 28 between 8 am and 9.30 am the first midterm exam of Physics 121 will be held:
  - Material covered: Chapters 1 - 6 of our text book.
  - Location: Hubbell.
- There will be a normal lecture after the exam (at 9.40 am in Hoyt).
- A Q&A session on the material covered on exam # 1 will take place on Tuesday evening 2/26 between 9 pm and 11 pm in Hoyt (location needs to be confirmed).
- There will be extra office hours on Tuesday 2/26 and Wednesday 2/28:
  - Tuesday: 1 - 4 pm (B&L 304) + 5 - 9 pm (POA library, 2 TAs)
  - Wednesday: 1 - 3 pm (B&L 304) + 2.45 - 4.45 pm (POA library, 1 TA) + 7 - 10 pm (2 - 3 TAs)

Course information.
Exam # 1.

- During workshops on Tuesday 2/26 and Wednesday 2/27, the focus will be exam # 1. You can attend any (or all) workshops on these days. Bring your questions!
- There will be no workshops and office hours on Thursday 2/28 and Friday 2/29.
- You will receive the exam back during workshop during the week of March 3.
- Any corrections to the grades of your grade can only be made by me, not by your TAs.
- The TAs will not see the exam until you see it.

Physics 121.
Quiz lecture 11.

- The quiz today will have 3 questions.

Conservation of energy.
A review.

- The mechanical energy of a system is defined as the sum of the kinetic energy K and the potential energy U:

$$E = K + U$$

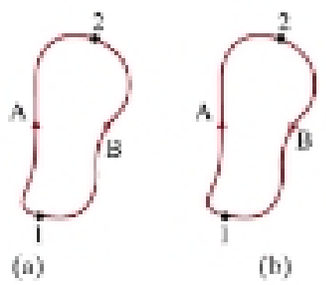
- If the total mechanical energy is constant, we must require that $\Delta E = 0$, or

$$\Delta K + \Delta U = 0$$

- We conclude that any change in the kinetic energy ΔK must be accompanied by an equal but opposite change in the potential energy ΔU.

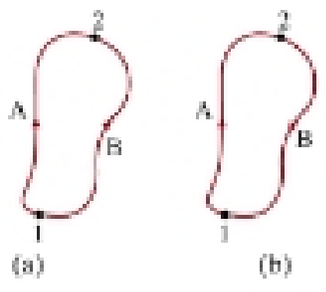
Conservation of energy. A review.

- Per definition, the change in potential energy is related to the work done by the force.
- The difference between the potential energy at (2) and at (1) depends on the work done by the force F along the path between (1) and (2).
- The potential at (2) is only uniquely defined if the work done by the force is independent of the path.



Conservation of energy. A review.

- If the work is independent of the path, the work around a closed path will be equal to 0 J.
- A force for which the work is independent of the path is called a **conservative force**.
- A force for which the work depends on the path is called a **non-conservative force**.



Conservation of energy. A review.

- Examples of conservative forces:
  - The spring force
  - The gravitational force
- Note: the conservative force is sometimes directed in the direction of motion, sometimes in the opposite direction.
- Examples of non-conservative forces:
  - The kinetic friction force
  - The drag force