# PHY 2004: *Applied Physics in our world today*

**Neil S. Sullivan** ***Fall 2010***

**NPB Rm 2235**

**Email: sullivan@phys.ufl.edu**

**Tel. 352-846-3137**

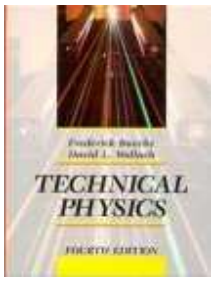
**Class meets: M W F (Period 8) 3:00 -3:50 PM**

**NPB 1001**

**Office Hours: M W F (Period 4) 10:40 – 11:30 AM**

**NPB 2235**

**Textbook:**




***Technical Physics***

**F. Bueche & D. Wallach**

**(4th ed., J. Wiley & Sons, 1994)**

**PHY 2004**

**GENERAL POINTS**

Reference materials, important dates: **CHECK** **course web site**

**Course Goals**

General introduction to use of physics in **everyday life**

Simple applications, useful in professional careers

Emphasis on principles (not lengthy calculations)

**Exams:**

Some problems in exams will be from problems

discussed in class and in in-class quizzes (clicker responses)

Make-up exams (date TBD) Need SIGNED documentation

from Dr. coach teacher etc.

**HITT:**

Have remotes by September 7 (to have in-class quizzes recorded)

# PHY 2004 Exams Fall 2010

**All here in NPB 1001**

**Mid-term: Best two 30 points each**

1. **Sept. 20 Pd 8 (3-3:50 PM)**
2. **Oct. 20 Pd 8 (3-3:50 PM)**
3. **Nov. 19 Pd 8 (3-3:50 PM)**
4. 

**Final Dec. 13 (3-5 PM) 40 points**

**unless third midterm better than final in which case**

**final =30 points and other mid-term=10 points)**

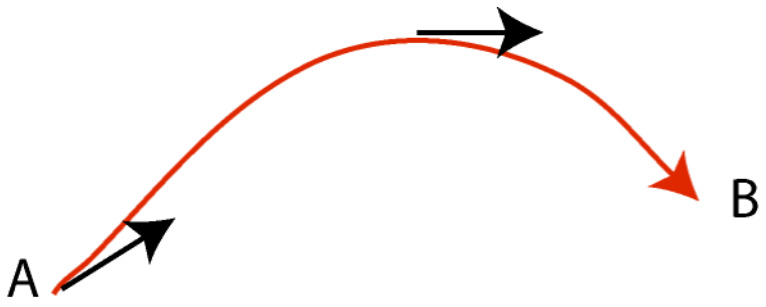
**In class questions = bonus of 5 %**

# LECTURE 2 PHY 2004

**MOTION**

**Speed (scalar) distance per unit time meters/sec**

**Velocity (vector) speed + direction**




**Direction different at different points**

**Average velocity = displacement vector AB/time**

# Acceleration (vector)

**Rate of change of velocity**

**$a = (V_F - V_I)/t$ OR $V_F = V_I + at$**

**Uniform acceleration (typical in this class)**

**e.g. gravity, rockets**

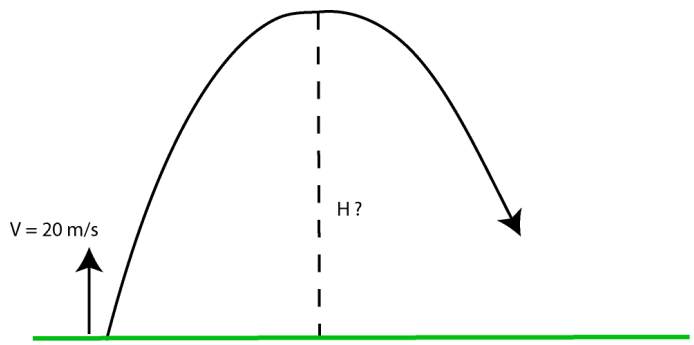
**$X = V_{avg}\, t$ where $V_{avg}$ is average velocity $V_{avg} = (V_I + V_F)/2$**

**THUS $X = (V_F^2 - V_I^2/2a)$ OR $V_F^2 = V_I^2 + 2aX$**

**ALSO $X = V_{avg}\, t$ OR $X = V_I t + (1/2)at^2$**

# LECTURE 3 PHY 2004

**Gravity constant at Earth's surface (always "down")**




## Typical problem

**Throw ball up at 20 m/s. How high will it go?**

$V_F^2 = V_i^2 + 2aH$

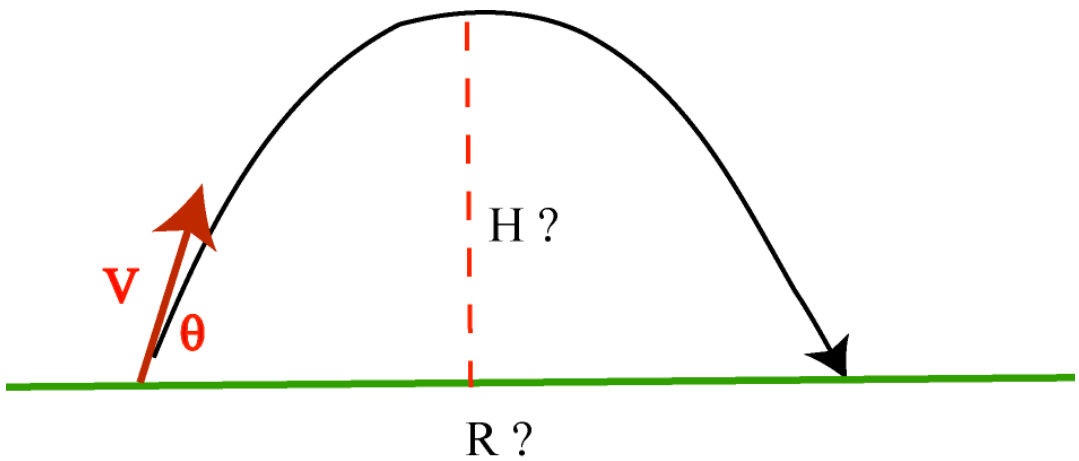
$a = -9.8\ m/s^2$ ( gravity DOWN deceleration )

$V_F = 0$

$0 = 202 - 2(9.8)H$

$H = 400/19.6 = 20.4\ m$

## Projectile Motion




**Initial velocity V at angle θ to horizontal**

**Calculate R**

**Calculate θ**

**More next time.**