How Things Work

Physics 1060
Lou Bloomfield

Turn off all electronic devices

What is *Physics?*

Physics is the study of the basic physical world
- Explains and predicts how the universe works
- Addresses the how and why questions
- A key component of scientific literacy

Physics is woven throughout modern life
- Underlies much of our technological society
- Addresses many serious problems humanity will face in your lifetime

What is *How Things Work*?

It's physics in the context of objects
- Priorities are: Objects → Physics Concepts → Formulas
- Priorities are not: Formulas → Concepts → Objects
- It's a "backwards" physics course

It's the "Case Study" method

It's all the how and why questions

It's how scientists actually discover science

Goals and Expectations

I hope that you will
- develop your understanding and intuition
- appreciate the role of physics in your world
- see our universe is predictable, not magical
- learn to enjoy science, not fear it

I expect that you will
- think rather than memorize
- focus on concepts rather than formulas
- learn to understand and apply those concepts

I assume no prior study of physics

Former PHYS 1050 students will get a two-week review

In Class Question

What is your background in physics?

A. None, or none that stuck with me.
B. Some, but I've never taken a physics class.
C. I've taken up to a year of physics.
D. I've taken up to two years of physics.
E. I'm actually an alien scientist visiting Earth by way of a wormhole

In Class Question

Can you distinguish the following physical quantities?
velocity from acceleration
mass from weight
force from momentum

A. Huh?
B. I have a faint sense of their differences.
C. I might be able to distinguish each pair.
D. I can probably distinguish each pair.
E. I can definitely distinguish each pair.

Things to Do

- Read the syllabus (see: rabi.phys.virginia.edu/1050)
- Read the online book (or printed book), ideally before each class
  - Watch the online video figures
  - Do the online practice questions
  - Learning physics concepts requires several passes
- Keep track of problem sets and exams
  - 10 problem sets
  - 2 midterm exams
  - 1 final exam

Final Thoughts

Ask questions and volunteer in class

Do the demonstrations yourself after class

Talk with me before or after class, and come to my office hours

This room is open before and after class

During class, please enter or exit through the rear doors if possible

Please put away all electronic devices during class