WELCOME to Physics 113

This class is a physics survey course designed for science majors who are not majoring in physics or engineering.

- **Vectors**
- **Linear and multi-dimensional motion**
- **Work**
- **Energy**
- **Gravitation**
- **Simple harmonic motion**
- **Conservation of momentum and energy**
- **Constant acceleration motion**
- **Rotational motion**
- **Thermodynamics**
- **Waves**

Some knowledge of calculus is assumed (techniques will be reviewed as needed).

No previous physics instruction is assumed.

Surgeon General's warning: No matter what you're smoking, this is not your high school course.

Professor Steven Manly
B&L 203E
5-8473
steven.manly@rochester.edu

http://web.pas.rochester.edu/~manly/class/P113_2006/

Name

University (@mail …) email address

Year: Fr/So/Jr/Sr?

Did you receive the email I sent earlier in the week to the class listserve? Yes/No If "No", provide SID

Favorite midnight snack

Why are you in this course?

Why are ***You*** here?

It is a requirement for my major.

I have to take the course to apply to med school.

I have to take the course to graduate.

Why ***is*** this a requirement for your major?

fluid flow, arteries, water fountains, commodes

mechanics of breathing, walking, running, flying, standing

Golf

all sports: curve balls, spin in tennis, drag in swimming, etc.

Motors, gears, wheels, ambulances, bikes

buildings, doors, bridges, skeletons

Chemical bond modeling, energy concepts, heat flow

planes, boats

gravity

The foundation for physics 114 material

The essence of chemistry is
electromagnetism + quantum mechanics

X-rays, mass spectroscopy, visible light spectroscopy, IR spectroscopy, nature of the chemical bond, CAT scans, NMR of all sorts, EKG, nerve function, cell phones, elevator motors, ambulance lights, microscopes, dental drills, surgical lights, electrophoresis, carbon-14 dating, LASIK, laser surgery, radionuclide labeling, radiation treatments of cancer with beams and with implanted sources, mp3 players, radios, televisions, cathode ray tubes of all sorts, defibrillators, computers, digital imaging, cameras, copy machines, refrigerators, heaters, power from the wall, heating espresso, PIXUS, automatic toilets, microwaves, CD's, DVD's, streaming video, Napster, Ipods, any aspect of the internet, optical fibers, telephones, electric power transformers, credit card information stored in magnetic strips, bar code scanning, signal cables, eye glasses, MRI, contact lenses ….

Why do *I* think you are here?

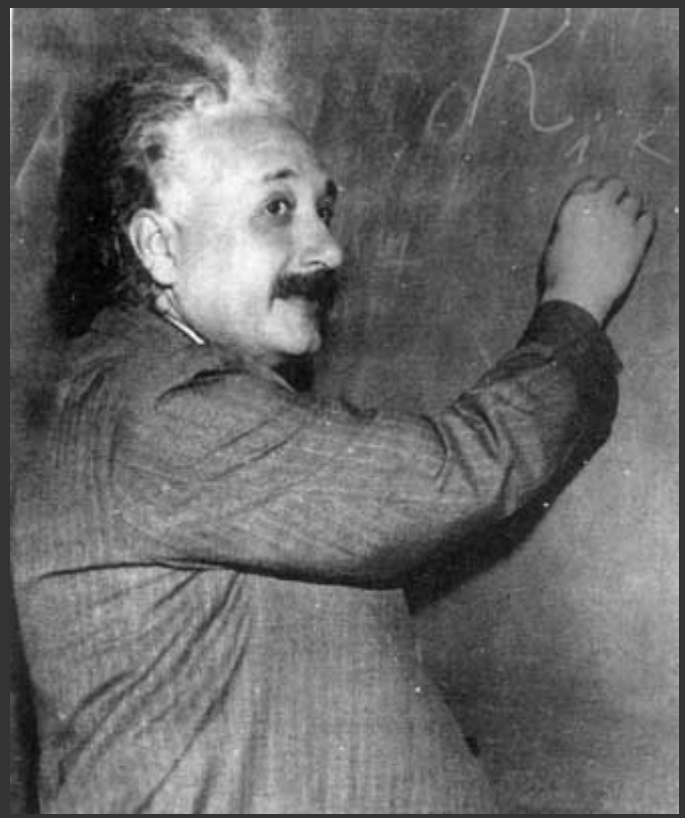
Awareness and respect for physics in the real (your) world

To learn to solve some basic physics problems.

To learn to solve problems.

Not on the list: To learn to be physicists.

“It is not so very important for a person to learn facts. For that he does not really need a college. He can learn them from books. The value of an education in a liberal arts college is not the learning of many facts but the training of the mind to think something that cannot be learned from textbooks.”



- Albert Einstein, 1921, commenting on Thomas Edison’s opinion that a college education is useless.

Components of the course:

Lecture

Concepts, depth, association with the rest of life, other disciplines, systematic technique, gotchas, class issues, hints, some problem solving

Components of the course:

Lecture

Lab

Run independently. Part of your P113 grade. Must do all 5 labs to get a grade in P113.

Components of the course:

Lecture

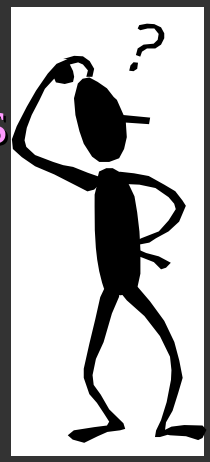
Text

More depth and associations, different approach, problems, not a substitute for lecture or doing problem sets

Lab

Components of the course:

Problem sets



Lecture

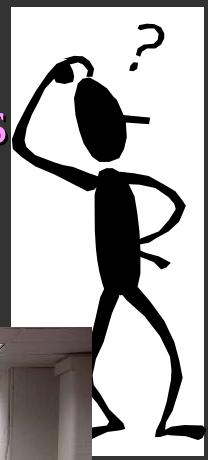
Text

Lab

Absolutely critical that you struggle with them and follow thru on particular personal questions/issues, one problem (random) graded, solutions released, you must follow thru

Components of the course:

Problem sets



Lecture

Text

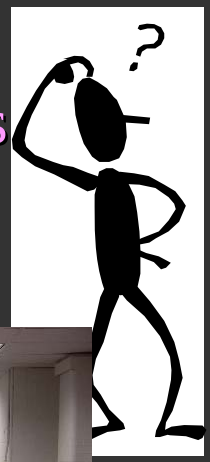
Workshop

Lab

My way to help you help yourself!

Components of the course:

Problem sets



Lecture

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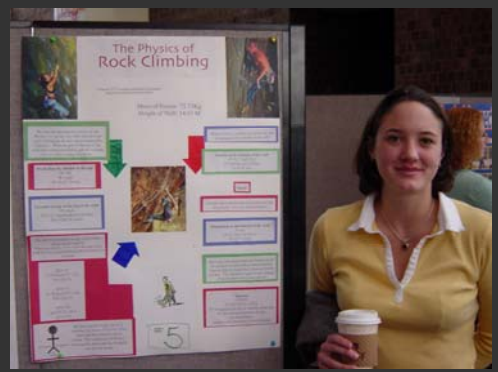
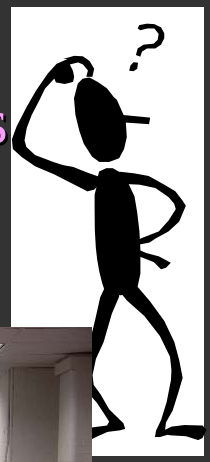


Project

A chance to explore some things not in the text, you will evaluate the projects

Components of the course:

Problem sets

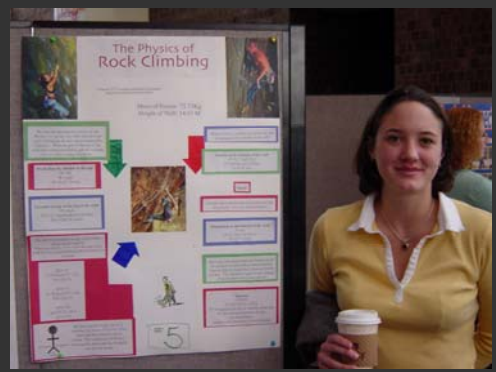


Lecture

Text

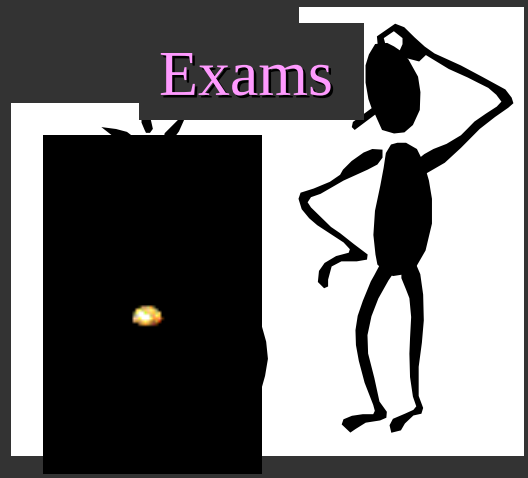
Workshop

Lab



Project

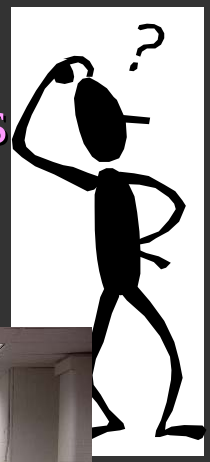
Exams



Components of the course:

Online interactives

Problem sets



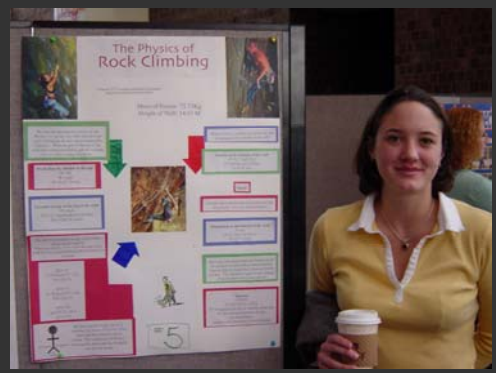
Lecture

Text

Workshop

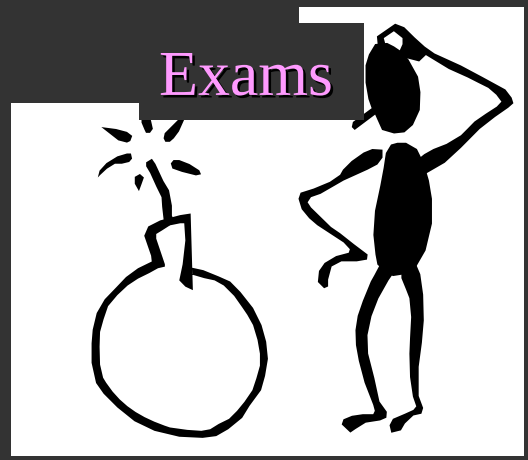
PRS

Lab



Project

Exams



Evaluation:

Scheme	Exam 1	Exam 2	Exam 3	Final exam	Lab	Prob sets	Project
1	---	16%	16%	32%	14%	9%	13%
2	16%	---	16%	32%	14%	9%	13%
3	16%	16%	---	32%	14%	9%	13%
4	16%	16%	16%	16%	14%	9%	13%
5	18%	18%	18%	23%	14%	9%	---

Each scheme calculated, best average sets your place on the numerical curve

I place grade boundaries on numerical curve

Does workshop work?

1999 P114 split class experiment:

41 students assigned to workshops, 110 assigned to recitations

Random assignments (all but 2 students in class wanted wkshops)

Ignored drops

B- or better →

>5 workshops = 93%

recitation+(<6 workshops) = 63%

Not split classes but …

	P113 2002	P121 2003	P114 2004
n	169	186	133
attend >7 wkshps	69%	54%	67%
B- or better >6 wkshp	77%	80%	88%
B- or better <=6 wkshp	40%	47%	40%

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- Thou shall talk to ME the moment you sense impending doom.

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OR ELSE THOU SHALL GET SCREWED!

For those of you who like to pick and choose the commandments you follow ….

The really, really important ones ...

And the keys to ***POST-PHYSICS NIRVANA*** are

Problem sets (the right way)

Workshop

Don’t cram

More stuff:

E-mail list

Workshops begin week of Sept. 11 and workshop section signup begins soon, will send email with link

Office hours (Manly: Tues 2-3:30 and 4:30-5:00 pm or by appt., TA's: office hours on web site)

Problem sets and solutions: PS #1 is on the web (or will be soon) and is due Sept. 14!

Lab start time information will be forthcoming

physlabs@pas.rochester.edu

Immediate concern for you:

- Workshop signup
- Laboratory section signup
- Make sure you are on email list for class
- Get PRS
- Problem set #1