Welcome to Physics 101!
Physics 101: Lecture 01

http://courses.physics.illinois.edu/phys101/

Meet the Lecturer

- Professor Scott Willenbrock
  willen@illinois.edu

- Office Hours
  - ➔Physics Help Center, 271 Loomis
  - ➔Start next week (schedule will be posted under "Office Hours" tab in course website)

- Research
  - » Sustainable Energy

https://physics.illinois.edu/outreach/zero-net-energy-house/

Physics 101 covers…

- Kinematics (study of motion)
- Forces (dynamics)
- Energy/Momentum
- Rotational motion and rotational dynamics
- Fluids
- Waves/Sound
- Thermodynamics

The New Physics 101 Lab
(20% of your grade)

Focused on scientific skills & critical thinking.

Each week you will do an online “at home” pre-lab followed by an open-ended design-based activity in your lab class.

You will need an IOLab device to do your Prelabs & Labs (see Required Materials link on course web-page. Most of you will rent or buy online – do this ASAP to get delivery in time for Prelab 1).

Join the FlipItPhysics Lab course (instruction on course web-page):

- Prelab 0: Due next week (IOLab not needed. No lab class next week.).
- Prelab 1 and Lab 1: Week starting Sept 9 (see lab course calendar).

If you are creative, work hard, learn from failure, and work well with others, you will get a high lab grade.

If you have any problems with hardware or software, see Mats in 303 Loomis (mats@illinois.edu)

Excused (EX) Absences

- Can get excused absences for:
  - ➔Discussions
  - ➔Labs
  - ➔Exams
- ONLY for:
  - ➔Illness
  - ➔Emergency
  - ➔Required attendance at University event
  - ➔Religious observance or practice
  - ➔Serving as volunteer emergency worker
  - ➔Job interviews
- Absence excuses must be submitted within 2 WEEKS of absence!

Step 1

PHYS 101 Fall 2015

Attendance

Section Attendance

Students are expected to attend the laboratory and discussion section in which they are registered. ***Section swapping is not allowed.***

Tardiness

- If you show up to any section (lab or discussion) ***10 or more minutes late***, you forfeit all credit for quizzes missed that day.
- If you show up to an exam ***10 or more minutes late***, you will not be given any extra time to complete the exam.

Please be on time for all sections/exams.

Absences

Types of Absence
Two types of absence can be recorded in the gradebook:

- Excused absences--issued a grade of **EX**
- Unexcused absences--issued a grade of **ABS**
  - Equates to a grade of zero (0) for the missed course component.

The ***only*** course components eligible to be issued a grade of EX:

- Discussions
- Exams

Regardless of the type of absence, discussion quizzes ***cannot be made up***.

The consequences of absences, excused or otherwise, are discussed in the course grading policy.

Excused Absences
Excused absences will be granted and documented in accordance with University policy as described in Article 1, Part 5 Class Attendance, of the Student Code.

Excused absences fall into the following categories as defined by the code:

- illness
- emergency beyond the student's control (e.g. an auto accident or death in the family)
- required attendance at a University event (e.g. varsity athletics)
- religious observance or practice
  - Requires request for accommodation for religious observances form.
  - Form must be uploaded to the Excused Absences application ***no later than two weeks after the first day of class***.
  - More information available from the Office of the Dean of Students.
- serving as an volunteer emergency worker

Procedures
The Excused Absences application will guide students through the procedure for documenting missed classes, including the effects of the absence on students' grades.

Step 2

P

Pre-lectures, Lecture, & Checkpoints

- Before Each Lecture Complete (in FlipItPhysics more on this later):
  - ➔Pre-lecture viewing
  - ➔Checkpoints
- View Pre-Lecture: Worth 25/1000 points
  - ➔No EX. Due 8:00 AM the day of lecture. Out of 29 lectures can miss 3 and still get all 25 points.
- Answer Checkpoint questions 25/1000 points
  - ➔Due 8:00 am day of lecture.
  - ➔1 point for honest attempt
- Everyone gets credit for today for Prelecture, Checkpoint, and Lecture (clicker participation); we will start with clicker questions on Wednesday so bring your clickers!

P101 Lectures

- Participation is key!
  - ➔Come to lecture prepared!
  - ➔1 point for each lecture using iclicker
    - » No EX, 29 Lectures: can miss three and still get all 25 points.
    - » Available at bookstore---*register using gradebook link on our web page*.
    - » Using multiple clickers is an academic integrity violation.

- Where we cover important material

➔Basic coverage of material	Prelecture
➔Concepts, problem solving, insights	Lecture
➔Comprehensive Overview	Electronic Textbook
➔Calculations, problem solving	Homework, Discussion, Additional Problems
➔Hands-On	Lab

- Taking Notes
  - ➔Lecture slides will be available on webpage before lecture under "handouts" and after lectures under "lectures".

P101 Homework

- Web based (FliItPhysics), immediate feedback (Sign in on course website)
- 100% if done before 8:00 am deadline (see schedule)
- 80% credit on unfinished parts until following Thursday
- 0% after that
- Always keep 5 significant figures! (Homework accuracy is unforgiving)
- First one is due Thursday 9/5/19!

More on FlipItPhysics
("material" needed for course)

- Need to go to FlipItPhysics (see Phys 101 website)
- Register for our course and purchase access for this semester (follow instructions on web site on how to ***create a new account***)
- It will cost you ~ $40
- What does it buy you?
  - ➔Access to on-line Homework
  - ➔Access to Checkpoint questions
  - ➔Electronic version (searchable) of the textbook (*College Physics*, Freeman, Ruskell, Kesten, Tauck, by Freeman Publishers)

Important attendance policy

- See web site under "attendance policy where it states:

"With four (4) or more missed labs or discussions, ***credit for the course will not be granted***"

Note that it doesn't matter if these 4 or more are excused absences

Course Grading

• Prelecture Viewing	25
• Checkpoints (before lecture)	25
• Lecture participation (iClickers in class)	25 (+20 bonus)
• Homework	75
• Lab	200
• Discussion 150 pts	
➔10 quizzes; drop lowest score	105
➔Participation points	45
• Hour Exams (3 x 100 **on-line**)	300
• Final Exam	200
	1000 + 20 bonus pts

Grading Scale

- 950-1000 A+
- 920-949 A
- 900-919 A-
- 880-899 B+
- 860-879 B
- 835-859 B-
- 810-834 C+
- 780-809 C
- 750-779 C-
- 720-749 D+
- 690-719 D
- 610-689 D-
- <610 F

Kinematics (Study of motion)

We use kinematics to describe:

- position and displacement
- velocity
- acceleration

Kinematics: Position and Displacement

- Position: Your current location
  - Need a coordinate system to determine it.
  - Use x for position along horizontal dimension.
- Displacement: is change in position
  - $\Delta x = x_f - x_0$

Kinematics: Velocity

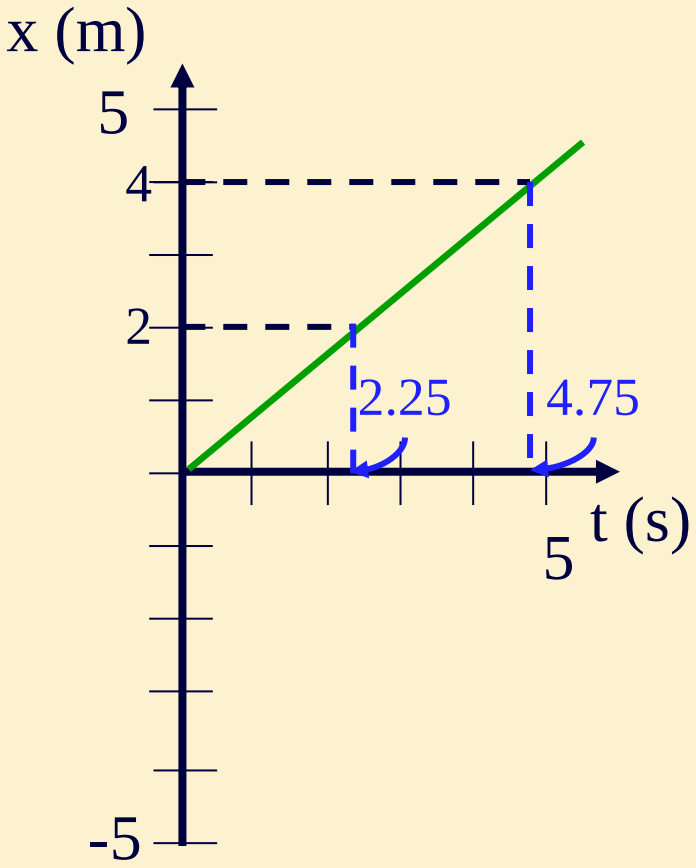
➔Velocity: the rate of change of position

» $v = \Delta x/\Delta t.$

» average

» instantaneous

Velocity: Plotting position and Time



Constant Velocity

- Average velocity:

  the *slope* between any two points on a position-time graph

- $v = \Delta x / \Delta t$

  ➔ $\Delta x = (4 - 2)$ m

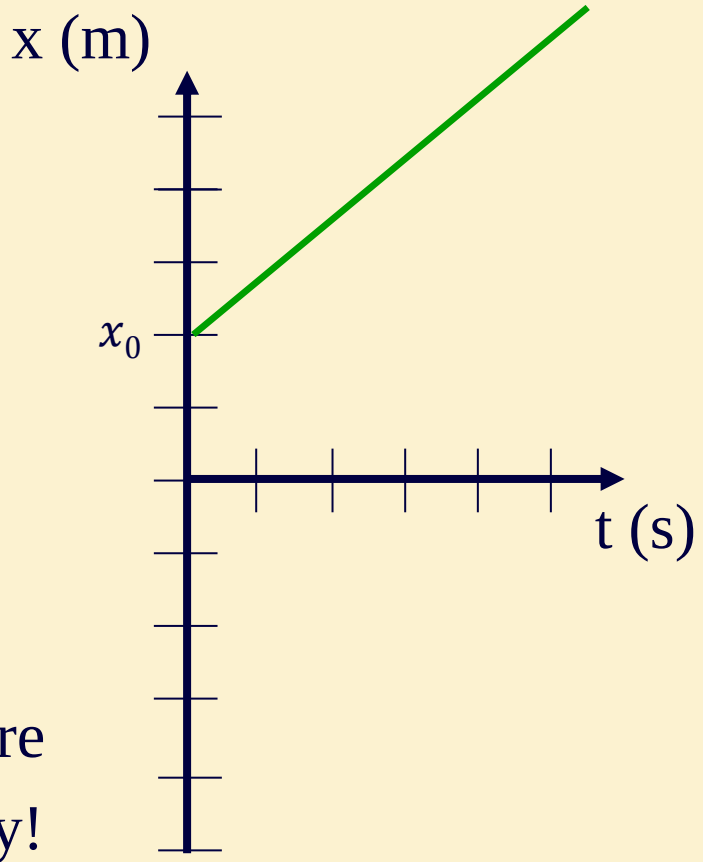
  ➔ $\Delta t = (4.75 - 2.25)$ s

  ➔ $v = \frac{2 \text{ m}}{2.5 \text{ s}} = 0.8 \text{ m/s}$

Equation for Constant Velocity

- $x = x_0 + vt$

Use this equation to predict the future path of an object at constant velocity!



Constant Velocity

Important Reminders

- Discussion sections start **tomorrow**, Tuesday.
- Labs start on Tuesday of **third week**.
- Buy/register your i>clicker on Gradebook. Clicker points start Wednesday of this week.
- In FlipItPhysics, do: Prelecture and Checkpoint for Wednesday.
- Buy the IOLab Unit from Macmillan (cheaper) or book store (more expensive). **See "Required Materials" tab**