

Welcome to Physics 101!

Physics 101: Lecture 01

A

"I am very excited about taking Physics 101!"

"I look forward to taking the physics labs"

"I'm so nervous.. dude so nervous"

"Anxious" "very scared" "honestly terrified"

"worried about my grade"

"worried about math"

"I am excited to learn about something other than biology."

<http://courses.physics.illinois.edu/phys101/com>

Meet the Lecturer

- Professor Charles F. Gammie
gammie@illinois.edu

- Office Hours

Wed 11:00AM-12:00PM

35 Loomis; start next week

- Research

- » Black holes

- » Formation of the Moon

<http://physics.illinois.edu/people/profile.asp?gammie>

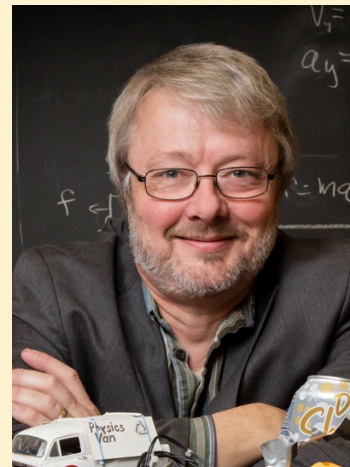


Course Directors

- Discussion Director:
Dr. Elaine C. Schulte



- Lab Director:
Professor Mats Selen



Physics 101 covers...

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

Course Grading

● Prelecture Viewing	50
● Bridge Set (before lecture)	25
● iClickers (in class)	25 (+20 bonus)
● Homework	150
● Lab (lowest lab score dropped)	250
● Discussion	100
➔ 10 quizzes; drop lowest score	
➔ Participation points	
● Hour Exams (3 x 80 on-line)	240
● Final Exam	160
	<hr/>
	1000 + 20 bonus pts

Grading Scale

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

How are bonus points awarded?

- Getting clicker Qs correct (20 points). We keep track of your correct answers and translate the % correct into the 20 points at the end.
- Bonus points are added to non-exam components of the course up to maximum of 500 pts.

Example:

At the end you have 493 total non-exam points and 12 bonus pts. We add 7 bonus to reach 500 and discard remaining 5 points.

Please do not ask...

- Do not ask for lecture clicker points to be excused because you forgot your i>clicker.
 - ➔ You can miss 3 lectures and still get perfect lecture grade.
- At the end of the course: Do not ask if you can do extra work to improve your grade.
 - ➔ Sorry, no.

Excused (EX) Absences

- Can get excused absences for:
 - ➔ Discussions (both quiz and participation)
 - ➔ 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!



Attendance Policy

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
- Labs
- 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 a 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.



Pre-lectures, Lecture, & Bridge Sets

- Before Each Lecture Complete (in **FlipItPhysics**; more on this later):
 - ➔ Pre-lecture viewing
 - ➔ Bridge Set
- View Pre-Lecture: Worth 50/1000 points
 - ➔ No EX. Due 6:00 AM the day of lecture. Out of 29 lectures can miss 3 and still get all 25 points.
- Answer Bridge Set 25/1000 points
 - ➔ No EX. Due 6:00 am day of lecture.
 - ➔ 1 point for honest attempt
- Print the **handout** (in “schedule” tab of course web site) if you wish to take notes on the lecture slides or load it to your laptop.
- Everyone gets credit for today for Bridge Set, Lecture (clicker participation) and Prelecture; we will start with clicker questions on Monday so bring your clickers!

P101 Lectures

- Participation is key!

- ➔ Come to lecture prepared!

- ➔ 1 point for each lecture using iclicker (**need to answer >75% of Qs**)

- » 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 PowerPoints will be available on webpage before lecture under “handouts” (evening before lecture) and after lectures under “lectures”.

Attending lectures is a great idea because:

- It will help you
 - ➔ Understand material
 - ➔ Understand the pre-lectures better
 - ➔ Do homework
 - ➔ Prepare for exams
 - ➔ Become a star at the physics game (more on this later)
- You get points for attending (i.e. you lose points for not attending)

P101 Homework

- Web based (FlipItPhysics), immediate feedback (Sign in on course website)
- 100% if done before 6:00 am deadline (see schedule)
- 80% credit on unfinished parts until following Thu
- 0% after that
- Always keep 5 significant figures! (Homework accuracy is unforgiving)
- First one is due Thursday 1/25/18! The first question in Homework 1 is an “opinion” question and everybody will get it “correct”.

More on FlipItPhysics

(“material” needed for course)

- Need to go to FlipItPhysics (Google it to find URL)
- 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 Bridge Sets
 - ➔ Electronic version (searchable) of the textbook (*College Physics*, Freeman, Ruskell, Kesten, Tauck, by Freeman Publishers)
 - ➔ Note: This is cheap! To buy paper version of book for just Phys 101 alone is \$150.

Discussion Sections

● Director: Dr. Elaine C. Schulte

eschulte@illinois.edu



Started yesterday!

- Quiz during last 20 minutes of section;
10 quizzes, drop lowest score
- First section: math review, dimensional analysis, problem solving tips.

P101 Labs

- Director: Professor Mats Selen

mats@illinois.edu

Research: Physics Education Research

- First Lab starts Wed Jan 24.
- Lowest lab grade is dropped.



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 may not be granted*”

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

Email policy

1. Nearly all admin Qs are answered in web site.
2. Please DO NOT email us about physics explanations or homework questions. Use Office hours!
3. Send questions on Lectures, Pre-lectures, and Clickers to Charles.
4. Send questions on Discussion to Elaine Schulte
5. Send questions about exam scheduling to Elaine Schulte (eschulte@Illinois.edu)
6. Send questions on Labs to Mats Selen
7. Your E-mail should have Physics 101 in the subject line

Physics Philosophy

- Physics combines both conceptual and quantitative approach to describing the natural world
- Physics relies on reproducible experiments, & uses mathematical models to explain results
- Physics describes large number of “complicated” observations with a few simple ideas.
- Exam problems may look different but they all do apply the same BIG IDEAS

Invitation to play the physics game

- Physics can be unforgiving, but only if
 - ➔ You don't apply the concepts and procedures that I will teach you.
 - ➔ You apply “Spooky Rules” that **you made up on your own** (usually based on wrong intuitions) and I did not teach you. You will be tempted often to use Spooky Rules. **RESIST! AVOID THEM!**
- Physics can be fun if you play by the rules of the game. I will do my best to teach you how to play the game, but you need to agree to play by the rules

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 and Acceleration

➔ Velocity: the rate of change of position

» $v = \Delta x / \Delta t.$

» average

» instantaneous

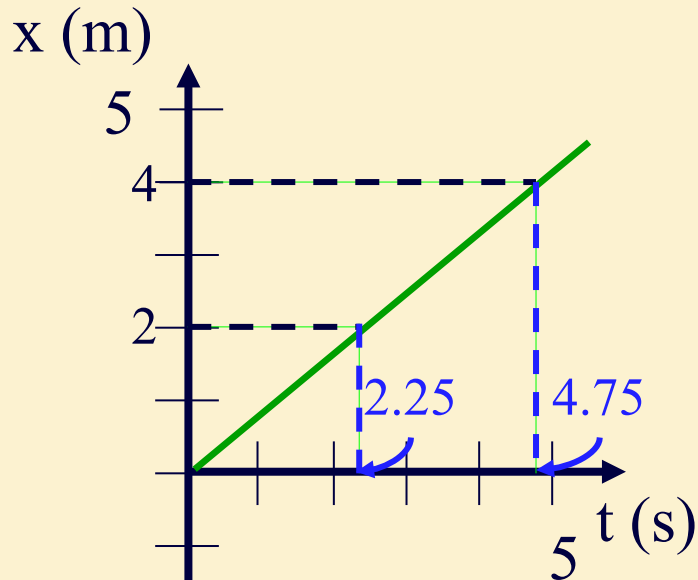
➔ Acceleration: the rate of change of velocity

» $a = \Delta v / \Delta t$

» average

» instantaneous

Velocity: Plotting position and Time



Constant Velocity

- Average velocity:

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

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

- ➔ $\Delta x = (4 - 2) \text{ m}$

- ➔ $\Delta t = (4.75 - 2.25) \text{ s}$

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

Important Reminders

- Discussion sections started **yesterday**, Tuesday.
- Labs start on Wednesday of **next week**.
- Buy/register your i>clicker on Gradebook. We will start giving points for clicker questions Monday of next week.
- In FlipItPhysics, do: Prelecture and Bridge Set for this coming Monday and all following Mondays & Wednesdays.
- Print handouts for lectures if you wish to bring them to class to take notes on them. Available evening before each lecture.