



# **Physics 4A: Newtonian Classical Mechanics**

Lana Sheridan

De Anza College

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# Overview of the Course: Topics

## What we will cover

- Kinematic motion in 1 & 2 dimensions, parabolic motion, circular motion
- Vectors, relative motion
- Forces, Newton's Laws (Dynamics)
- Energy
- Linear momentum, collisions, rockets
- Rotation
- Angular momentum, gyroscopes
- Statics
- Simple harmonic motion / oscillations
- Gravitation and motion of planets

# Overview of the Course: Textbook

## What we will cover

Chapters 1-13 of Serway & Jewett, pretty much in order, skipping some things in Chapter 12, and including a few things from Chapter 15.

## Book

- Physics for Scientists and Engineers (Vol. 1), 9th Edition, Serway & Jewett

## Other Books

- Fundamentals of Physics Extended, Halliday, Resnick, and Walker
- Feynman Lectures on Physics, Vol 1
- Physics for Scientists and Engineers, Knight

# Overview of the Course

## Should I take this course?

You should if:

- You enjoy physics and other technical subjects.
- You are able to spend time out of class working through ideas on your own.
- You like solving new problems.
- You will ask questions when you don't understand something.

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You should **not** if:

- You just want to be told what to memorize so you can pass a test.
- You are not confident with geometry / trigonometry.
- You do not have **at least 12 hours of time outside of class** to dedicate to this class.

# Overview of the Course

Make sure you will have enough time to study for this class!

From [www.deanza.edu/faculty/nickeldon/collegeunits.html](http://www.deanza.edu/faculty/nickeldon/collegeunits.html)

Allot 2 hours of study outside of class for each unit taken.  
For this class, a minimum of 12 hours a week outside of class.

# How to do well in physics (or anything)

Stephen Curry, on what it takes to succeed:

“If you take time to realize what your dream is and what you really want in life — no matter what it is, whether it’s sports or in other fields — you have to realize that there is always work to do, and you want to be the hardest working person in whatever you do, and you put yourself in a position to be successful. And you have to have a passion about what you do.”

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“Genius is one percent inspiration, ninety-nine percent perspiration.”

–Thomas Edison



**How do I get an A?**

(Or maybe, how do I pass?)

# Resources

## Resources for when you have questions

- Me. You can email me, ask me before class, or come to my office hours:  
**Tues 11:30am-12:30pm, Th 11:30am-12pm, and Fri 10:30-11am**
- Each other. Work together! It will improve your understanding.
- The Math & Science Tutorial Center.

## Where to look for course materials

- My website on the De Anza Physics page.  
**<http://nebula2.deanza.edu/~lanasheridan/>**

# Useful Survival Trick

# Useful Survival Trick

The Google logo is centered on the page. It consists of the word "Google" in its signature multi-colored font: the 'G' is blue, the first 'o' is red, the second 'o' is yellow, the 'g' is green, and the 'l' and 'e' are red.A long, empty rectangular search input field with a thin blue border, positioned below the Google logo.

Google Search

I'm Feeling Lucky

When you get stuck, use a search engine.

# Overview of the Course

## Evaluation

- Two tests and a final exam.
- Assignments (homework).
- Quizzes.
- Labs.

## Other Homework

- Uncollected homework problems from the textbook. (You still need to do them!)
- Read the textbook.

# Overview of the Course

## Evaluation

- Quizzes (13%)
- Assignments (13% total)
- 2 Tests, equally weighted (24% total, 12% each)
- Final exam (30%)
- Labs (20%)

# Overview of the Course

## Evaluation

Projected Grading Scheme:

95% → 100%	= A+
88% → 94%	= A
85% → 87%	= A-
82% → 84%	= B+
73% → 81%	= B
70% → 72%	= B-
67% → 69%	= C+
58% → 66%	= C
46% → 57%	= D
0% → 45%	= F

# Overview of the Course

## Note about presentation of work

- For each problem make sure your method is clear.
- If there is an equation or principle you are using, write it out at the start of your solution.
- Underline, box, highlight, or unambiguously emphasize the answer.
- If the reasoning is not clear, the answer is not correct.
- Give your answers to a reasonable number of significant figures.



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**Even correct answers without clear, correct reasoning, will lose almost all of the possible points.**

# Overview of the Course

## Note about collected assignments

- If you cannot come to class on a due date, email me the assignment and bring the hard copy to the next class.
- If you are ill, or will have a problem handing in an assignment on time, come talk to me **before** the due date.

# Course Tool

## Mentimeter

- Allows me to ask multiple choice questions or do surveys, and get real-time feedback.
- You can remain anonymous.
- You need a device connected to the internet.

You need to:

- 1 Go to **<https://menti.com>**
- 2 Enter the CODE.

# Course Survey and Mentimeter Trial Run

- 1 Why are you taking this course?
  - A Because physics is awesome.
  - B Because I want to go into a technical field, eg. science, engineering, computer science, *etc.*
  - C Because knowing more physics will make me better at my current job.
  - D Because I have to be here to get the course credit.

# Course Survey and Mentimeter Trial Run

2 Realistically, how much time do you have to work on this course outside of class?

A As much time as it takes to learn everything!

B 15-20 hours a week.

C 10-15 hours a week.

D 5-10 hours a week.

E I won't have time to work on this course outside of class.

# Course Survey and Mentimeter Trial Run

- 3 What was your previous physics course?
- A My most recent physics course was more than 1 year ago.
  - B High school physics.
  - C Physics 50 or 2A.
  - D Physics 4A (mostly completed), AP Physics with calculus, or equivalent.

# Course Survey and Mentimeter Trial Run

- 4 Which math course have you completed?
- A Only 1A, or equivalent. (Differential calculus)
  - B 1B, or equivalent. (Integral calculus)
  - C 1C. (Series, surfaces, parametric equations, vectors)
  - D 1D. (Vector calculus)

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- Does a smooth solid ball roll down a hill faster than a smooth solid cylindrical battery? If so, then why?

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- How can a pendulum clock keep accurate time, since friction slows pendulum arm?
- What laws govern the motion of the planets?

# This Course

Goals:

- be able to answer those types of conceptual questions
- know how to use theory to solve problems
- understanding principles and how they apply to technology

# Summary

- Course overview

## Homework

- Get the book: Physics for Scientists and Engineers (Vol. 1), 9th Edition, Serway & Jewett
- Read **Chapter 1** and make notes on it.