

# MR. VAKIL'S PHYSICS 2A SYLLABUS

**Instructor:** David Vakil.

**Course:** Physics 2A

**Office:** Physics 117F

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**Web Page:** [http://www.elcamino.edu/faculty/dvakil/physics\\_2a.html](http://www.elcamino.edu/faculty/dvakil/physics_2a.html) -- suggestions for the webpage are welcome! All materials except exams will be posted. If something is missing, please inform me.

**Office Hours:** right after class = M-Th 3:55-4:30pm or by appointment. **Use them!**

**Texts:** College Physics (Vol. 1) by Serway, Faughn, and Vuille, 7<sup>th</sup> edition (2006). I don't know if new copies of this book are still available.

Lab Manual for Physics 2A & 3A

You need to **bring the text to class** everyday! You may find **colored pencils/pens** useful during class. I will be using colored chalk on many occasions.

There will be **FREE tutoring** available in the Learning Resource Center on the second floor of the main library, Mondays, Tuesdays, and Wednesdays from noon to 2pm.

## Podcasts/Videos

I haven't tried this before for a physics class, so I make no promises. However this was helpful to some students during my astronomy classes in the past, so I will try to find a way to make this work for our class, too. During class, I may wear or use a microphone and maybe have my computer create a movie from what's on the computer screen while recording what the microphone records. (I may skip the video portion for physics.)

These podcasts/videos will be posted on the course website. Please note: things you say may be recorded on the video. These podcasts/videos are provided solely to help you succeed. They should help students who need to see/hear things again or at a different pace, as well as to help students who miss class. However, daily attendance is still mandatory, as described below. Do not rely on the podcast/video instead of coming to class!

## Disabilities

If you have a disability (learning, physical, seeing, hearing, or otherwise), let me know so I can work with you. The note card that I ask you to fill out (see homework handout) is a good place to do this. You should also consider visiting the Special Resource Center, located in the Student Services Building. The first code is my (i.e. your astronomy professor's) last name and my office location.

## Safety notice

Campus police and cadet escorts are available to take you to and from your car before, during, and after class. You can contact them with a campus "blue light" phone, located in various areas on campus. Or ask your instructor to call them for you. I am certainly happy to place this call. If you prefer, you can call them from any phone: 310-660-3100, or dial 3100 from any campus phone.

## Course description

This course is an introductory physics course. At the end of the term, you should have developed qualitative and quantitative problem-solving skills that will help you in future classes and in many of life's endeavors. In addition, you are expected to be knowledgeable in the material covered.

## Student Learning Outcome and Course Objectives

**Student Learning Outcome:** Given a physics word problem, students will analyze the given information, identify the physical principles required to solve the problem, model the physical principles, and formulate the equations necessary to solve the problem. Students will solve the equations and correctly report the answer.

**Course Objectives:** On successful completion of this course, the student will be able to:

1. Analyze physical problems in order to:
  - a. recognize the physical principles required to solve the problem,
  - b. isolate and model the physical principles underlying each part of the problem,
  - c. formulate the equations for each part,
  - d. combine and solve the system of equations for the problem,
  - e. assess the physical reality of the result in terms of the data given, for a variety of physical situations involving the topics covered in the course.
2. Explain conceptually and/or quantitatively, physical phenomena perhaps too difficult for realistic mathematical modeling at the introductory physics level.
3. Demonstrate the ability to:
  - a. construct simple mechanical systems,
  - b. make meaningful measurements using basic mechanical measuring devices,
  - c. manipulate the collected data using basic error theories,
  - d. report the outcome of the experiment, and
  - e. explain the results physically.
4. Demonstrate ability to solve problems using
  - a. Newton's Laws of motion
  - b. momentum and impulse
  - c. work-energy theorem [or just energy problems in general]
  - d. torque
  - e. the laws of thermodynamics [maybe not too much of this]
  - f. hydrostatics
  - g. hydrodynamics
  - h. Newton's Law of Universal Gravitation [and only a little of this]
  - i. Simple Harmonic Motion [and this]

## Homework, late policy, and neatness

Homework problems are worth two points each and will come in sets of approximately 10 problems. However, **only a subset of the problems will be collected and graded**. All homework assignments and labs are **due at the beginning of class** on the due date. Homework submitted 30 minutes after class begins will be marked late and will be penalized 20%. No homework will be accepted more than 1 class day late, unless arranged 2 days prior to the due date. This strictly-enforced late policy allows me to post solutions quickly. There are deadlines in the real world and they don't change for emergencies or because you left something at home. You're in college, and it's time to prepare for the challenges in the real world.

All assigned problems should be attempted – *the biggest source of lost points is when students do not attempt problems*. **Partial credit will be awarded**, so if you try to solve the problem and fail, please submit your attempt. In order to receive partial credit, you must submit a real attempt at the problem. Blank problems will not be rewarded. **I strongly urge you not to erase. Instead, cross material out in a way that allows you to see what you did, even if you later think it is wrong.**

Solutions to homework problems will be posted in the window cases outside the physics faculty offices one or two days after submission (or earlier, if needed to help study for an exam). The posted solutions will be brief. **Questions and requests for clarification**, of course, **are always welcome** and appreciated.

## Make-up work & missing (or doing badly on) exams or labs

**Please note:** No make-up exams or labs will be offered except under very extenuating circumstances. Your lowest exam and lab grades will be replaced by 0.9 times the average of the other exams/labs, if this is to your advantage.

## Clickers

A radio-frequency personal response system (a.k.a. “clickers” which function like “Ask the audience” on TV’s *Who Wants to Be a Millionaire*) will be used frequently during the class. Clickers will be used to take attendance daily, to ask multiple-choice questions, possibly for short graded (pop?) quizzes, and whatever other functions we deem necessary. **Answering clicker questions is required. Participation will be graded, but correctness of answers will not.**

## Exams

**Exam Format:** Homework-type problems and **several short answer conceptual questions.**

**Bring to each exam:** a calculator. You may also prepare a 3”x5” index card (front and back). All information on the card must be in your own handwriting. Three 3x5 cards or one side of an 8.5”x11” piece of paper are allowed on the final exam. **Students whose first language is not English may bring an English translator (book or electronic) to exams, if approved at least one class prior to the exam.**

## Attendance

Please be prompt and do not leave class early without a good reason. Frequent disruptions of the class will negatively influence your grade. **Attendance in this class is mandatory, will be taken daily, and will form part of your “clicker” grade.** Material will be covered in class that is not in the textbook and this material will appear on homework and exams. Classroom time is meant to supplement the readings from the text and vice-versa.

Attendance will not count towards your grade. However, if you’ve missed more than **eight** hours of class without justification, and you are failing, you **may** be dropped. If you wish to be dropped from the class, it is your responsibility to withdraw. Do not count on me to drop you just because you do not show up for class. Students who withdraw from the course after **July 28** will receive a letter grade based on the entire semester's requirements. If you wish to receive a refund for this class, you must drop by **June 25**. If you wish to drop and receive no mark on your record, do so by **July 7**.

## Expectations

You should plan to work outside of class for at least 1.5 hours (and more likely 2-3 hours) for every hour of class time (which amounts to 6-18 hours per week). It should take you at least 30 minutes alone to do the required reading each night. While this may sound like a lot, it is no more an impingement on your time than most college classes at four-year schools (e.g. USC, UC, CSU). You will find the reading helpful later, when you start to work on the homework problems.

You are expected to work at (or above) the college level and most of you will find that this requires a lot of preparation outside of class. Do not be surprised to find yourself needing around 7 hours per week for the homework problems in the middle of the term. However, no more than 20-30 minutes should be spent on any one problem in one sitting. If you have not made significant progress after half an hour, put the problems down, do something else, and come back to them many hours (or days) later. If that doesn’t work, **ask for help**. Hopefully, this strategy will decrease the total time spent on homework. Your time investment will decrease as your experience and intuitions grow.

The most important expectation I have of you is to **ask questions** (either in class or in office hours) especially if you do not understand something covered in class (or in the readings). I cannot read minds, so help me help you (as Jerry Maguire says). **Don't be shy**. Chances are that if you are having trouble with something in class, **you are not alone** and I need to address it.

## Laboratory Exercises

Lab activities will be handed out at least one class in advance or will come from the lab manual. For such labs, you will be expected to have read the material.

## Final Important Remarks

Working together on homework and lab experiments is allowed and encouraged. However, copying other student's work (partially, or in full) is plagiarism, is unacceptable, and is not as difficult to detect as you might think. **No credit will be given to plagiarized work.** If you worked in a group on the homework and most members in the group have similar solutions, **make a note of who was in your group. In other words, give credit where credit is due.** See the homework assignment page for more details about groupwork.

### Some hints for success:

1. Ask questions in class to clarify points not understood
2. Compare notes with peers after class
3. Read material before class, and then again afterwards
4. Be certain you have the necessary background (e.g. you are comfortable solving systems of equations)
5. Attend every lecture
6. Do not fall behind. If you do, work diligently to catch up.
7. Allow as much time as possible to review for exams. **Do not cram everything at the last minute.**
8. **Make use of my office hours and tutors** for questions you may have.
9. **Keep all handed-back assignments.** My computer deletes and changes scores.

### If you are struggling:

I may ask to see students that are struggling during the semester. While I cannot require you to visit me, I strongly suggest you visit when suggested.

# SAMPLE INDEX CARD (USE BACK IF NEEDED)

Due next class

**Last name, First name** (nickname if preferred) Semester (e.g. Summer 2009)  
Course (e.g. Physics 2A)

Phone number (best one to reach you at)

Non-ECC Email address – print clearly! **You have a free ECC email address that you should use for ALL ECC emails: firstname\_lastname@elcamino.edu**

Your job, how many hours per week you work

Major/Minor (if you have one)

Total units you're taking and/or what other classes you're in

Why are you taking classes at ECC?

What is your overall educational goal?

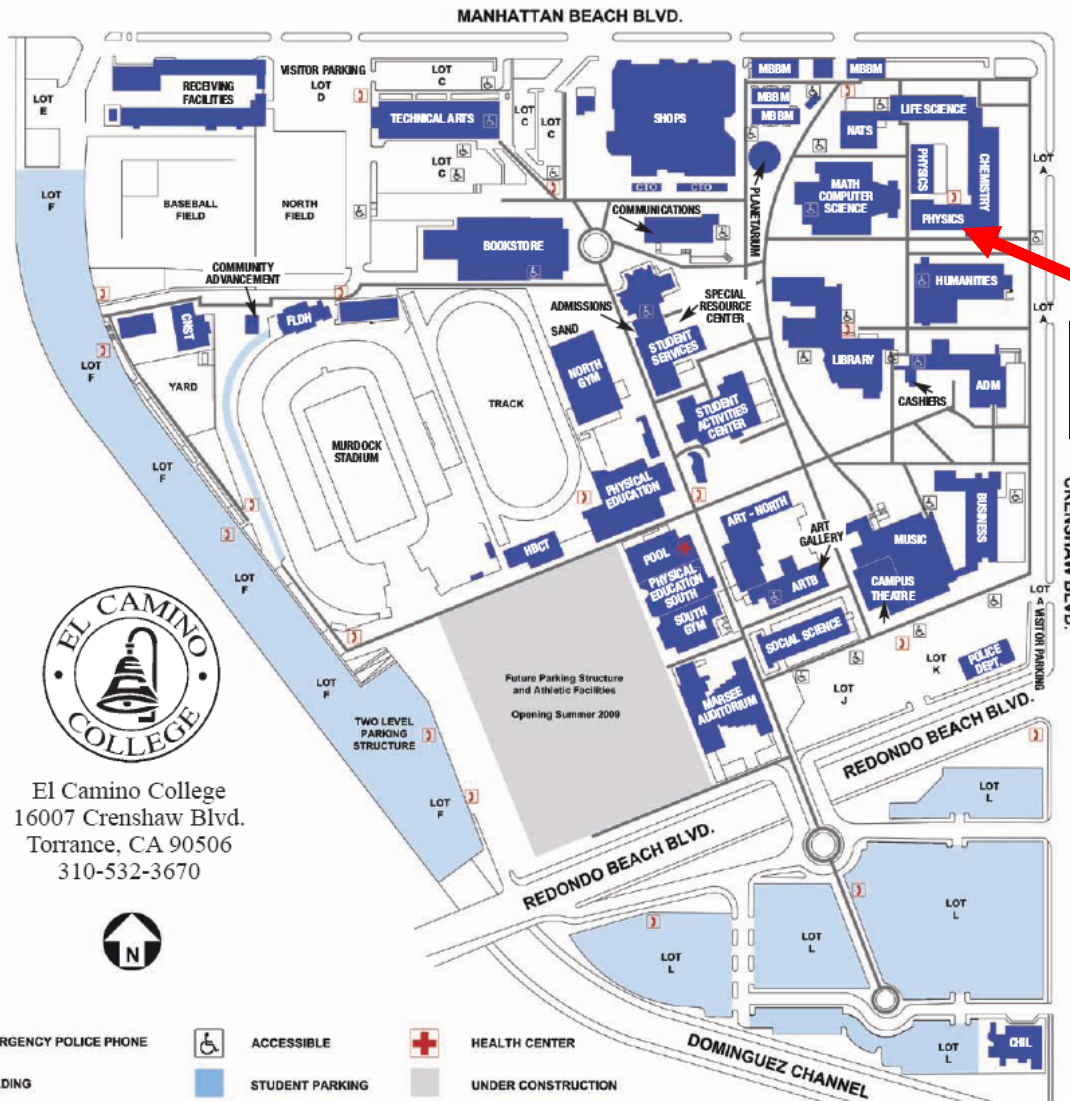
What do you hope to gain from this course?

Is there anything I should know about you as your instructor? (e.g. disabilities, bad vision, ADHD, etc.)

List two things you like people to know about you. (Hobbies?)



# ECC CAMPUS MAP



Mr. Vakil's office =  
Physics 117F is here



El Camino College  
16007 Crenshaw Blvd.  
Torrance, CA 90506  
310-532-3670



**KEY:**

- EMERGENCY POLICE PHONE
- ACCESSIBLE
- HEALTH CENTER
- BUILDING
- STUDENT PARKING
- UNDER CONSTRUCTION

## EL CAMINO COLLEGE

BUILDING / LOCATION	ABBREVIATION	BUILDING / LOCATION	ABBREVIATION
ADMINISTRATION	ADM	MATH / COMPUTER SCIENCE	MCS
ART AND BEHAVIORAL SCIENCE	ARTB	MURDOCK STADIUM	STAD
ART BUILDING - NORTH	ARTN	MUSIC	MUSI
BASEBALL FIELD	BBFL	NATURAL SCIENCE	NATS
BOOKSTORE	BKST	NORTH FIELD	NFLD
BUSINESS	BUSI	NORTH GYM	NGYM
POLICE DEPARTMENT	ECPD	PHYSICAL EDUCATION	PE
CAMPUS THEATRE	TH	PHYSICAL EDUCATION SOUTH	PE-S
CHEMISTRY	CHEM	PHYSICS	PHYS
CHERRY TREE OFFICES	CTO	PLANETARIUM	PLAN
CHILD DEVELOPMENT CENTER	CHIL	POOL	POOL
COMMUNICATIONS	COMM	SAND COURTS	SAND
COMMUNITY ADVANCEMENT OFFICE	CADV	SHOPS	SHOP
CONSTRUCTION TECHNOLOGY	CNST	SOCIAL SCIENCE	SOCS
FIELDHOUSE	FLDH	SOUTH GYM	SGYM
HANDBALL COURTS	HBCT	SPECIAL RESOURCE CENTER	SRC
HUMANITIES	H	STUDENT ACTIVITIES CENTER	ACTC
SCHAUERMAN LIBRARY	LIB	STUDENT SERVICES CENTER	SSVC
LIFE SCIENCE	LS	TECHNICAL ARTS	TECH
MANHATTAN BEACH BLVD. MODULES	MBBM	TRACK	TRAK
MARSEE AUDITORIUM	AUD	YARD	YARD