

**San José State University**  
**Department of Physics & Astronomy**  
**Physics 2a, Fundamentals of Physics, Section 1, Fall, 2018**

**Course and Contact Information**

<b>Instructor:</b>	Paul Houck
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<b>Email:</b>	Paul.Houck@sjsu.edu
<b>Office Hours:</b>	Tuesdays Thursdays 11am-1pm
<b>Class Days/Time:</b>	Fridays, 8:00 -9:20am
<b>Classroom:</b>	SCI 142
<b>Prerequisites:</b>	<b>Algebra; RECOMMENDED: Geometry &amp; Trigonometry</b>
<b>Class Website:</b>	FA18: PHYS-2A Sec 01 - Fund of Physics on Canvas: <a href="https://sjsu.instructure.com/">https://sjsu.instructure.com/</a>
<b>Labs:</b>	Physics 2a: 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, or 21
<b>Required Materials:</b>	Required: <b>Physics 2a Lab book</b> Optional: <b>College Physics: A Models Approach I &amp; II</b> (free on canvas) Required: You must purchase a <b>3-ring binder</b> Optional: <b>Openstax College Physics</b> (Free Online) <a href="http://openstaxcollege.org/textbooks/college-physics">http://openstaxcollege.org/textbooks/college-physics</a> Optional: Knight College Physics: A Strategic Approach (4th Edition)

**Welcome to Physics 2a!**

This course is deliberately facilitated in a way to make it more consistent with what current research reveals about how students learn science. The lecture is not designed to function as the means by which you acquire the course content. Rather, it is to be used to provide focus and a framework for your lab experience and the time you spend outside of class. Much of your learning will occur as you participate in various types of activities, experiments, and discussions in small groups in lecture and lab, and also as you carry out the homework assignments between each meeting. For more information on what current research says, please see the “Research on Active Learning” file on canvas.

The lecture for this course is integrated with the lab. This means that in every lecture meeting you will either review or preview material related to the lab. There will be a quiz or a practice quiz EVERY week in lecture. Because the lecture only meets for 80 minutes per week, the vast majority of the content you will be tested on is covered in lab, and repeated in lecture.

**Course Webpage**

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on the Canvas learning management system course website. The greensheet and other course materials such as course lectures

will be available through our website on canvas. Access it here: <https://sjsu.instructure.com/> by logging in with your my sjsu info. You are responsible for familiarizing yourself with assignments and due dates as listed on this site. Make sure that the email address that you have attached to canvas is one you check regularly, as I sometimes will make announcements that will help your performance in class.

## Course Format

This course adopts an interactive engagement format, meaning that you will be actively participating in lecture. I will be having you discussing topics in lecture. After lecture is over you will be expected to answer some short questions about your discussion on canvas. You will receive feedback as a class at the start of the following lecture. (10% of your final grade).

## Official Course Description

First Semester of a two-semester sequence that is non-calculus based and covers the topics of mechanics, heat, and sound.

## Learning Outcomes (Required) and Course Goals (Optional)

### GE/SJSU Studies Learning Outcomes

Upon successful completion of this course, students will be able to:

LO1: construct a logical argument based on evidence

LO2: communicate scientific ideas to peers and faculty

### Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO3 relate elements of physics to other sciences

LO4 successfully engage in written problem solving

LO5 apply basic physics concepts related to the course topics

## Required Texts/Readings

### Labbook

The required text for this class is the Physics 2A lab manual. **You can purchase the lab manual from the physics club in SCI 239.**

### Other equipment / material requirements (optional)

You must purchase a **3-ring binder** for the lab. You can put your activity sheets in this binder and any notes you take during lab. Remember that this is where the majority of the course content is covered.

Those interested in a supplementary text may use the free online Physics textbook at Openstax, available here: <http://openstaxcollege.org/textbooks/college-physics> . You may alternatively use other online sources or any algebra-based intro college physics book such as [College Physics a Strategic Approach \(Knight, Jones Field\) 4th Edition](#). I have been using the 3rd edition in Physics 2B.

# 1. Assignments and Grading Policy

## Grading Scheme:

The below course grading scheme will be followed. If you do better on the final exam than you do on the midterm, your final exam grade will replace your midterm grade. This allows you to improve a poor performance on the midterm. The only exception to this is that you may NOT replace a zero on the midterm. If you have an emergency that makes it impossible for you to attend the midterm exam, verification is required (example: doctor's note), and university policy will be strictly followed. Note that In the event that you fail the lab, you will automatically fail the course, regardless of what you earn in lecture. (The lab grading scheme is discussed under the heading "Lab," and all homework is a part of your lab grade.) This class will not be curved.

Quizzes:	30%
Cumulative Midterm:	30%
Lecture Participation:	10%
Cumulative Final Exam:	30%

Note that while the lecture and the discussion/lab are graded separately, they are combined at the end for one single Physics 2A course grade. To determine your final Physics 2A course grade your lecture grade gets multiplied by the Discussion/Lab multiplier. Homework is graded as a part of Discussion/Lab. Due to technical limitations, Canvas only keeps track of your lecture grade and does not reflect your overall course grade.

## Participation:

You will be using Canvas to follow up on questions from Lecture. I will ask questions during class and you will get credit for answering them and extrapolations. When using clickers I will always award points regardless of the correctness of the answer.

## Quizzes:

You will have a 20-25 minute quizzes as noted on the schedule at the end of this document. The quiz schedule is subject to change with reasonable notice.

## Midterm:

The purpose of the midterm is to give you an idea of the format of the final. The midterm for this class will be Friday, October 5<sup>th</sup> in lecture. It will take the entire class period.

## Final Exam:

Your final exam will be Monday, Dec 17th 7:15-9:30am in our lecture classroom. You will not be able to take the exam early or late. IF YOU CANNOT ATTEND THE FINAL EXAM DO NOT TAKE THIS COURSE. If you have an emergency that makes it impossible for you to attend the final exam, verification is required (example: doctor's note), and university policy will be strictly followed.

## Extra Credit

There is no extra credit for this course. This is final and there are no exceptions.

## Discussion Lab

Every student must pass the lab during the same semester as the lecture course. If you fail the lecture or the lab you will have to repeat both.

In Lab you will be graded on your completion of the homework, and your participation and leadership in the group activities. Your lab grade will be incorporated into your overall course grade in the following way:

High Pass (HP) Your course grade is multiplied by 1.05 (increased by 5%)

Requirements for HP:

- Must not have missed more than 1 homework assignments
- Must show consistent effort and leadership on a daily basis in class
- Class is better when you are there!
- ONLY 1 or 2 students per lab will receive an HP

Mid-Pass (MP) Your course grade is multiplied by 1.03 (increased by 3%)

- Must not have missed more than 2 homework assignments
- Must consistently be on task, and assisting group-mates during class on a daily basis
- Your group does better when you are there!
- ONLY 3 or 4 students per lab will receive an MP

Pass (P) Does not change your Course grade

- Complete homework
- Participate in class and show consistent effort
- The vast majority of students will receive a P

Low Pass (LP) Your course grade is multiplied by 0.93 (decreased by 7%)

You will receive a LP if any of the following apply for you:

- Miss 4 or more homework assignments
- Achieve an average homework score below 75%
- You are not consistently showing effort in class

Fail (F) This means you've failed the lab, and thus also the course.

- Miss 5 or more homework assignments
- Achieve an average homework score below 65%
- You are not consistently showing effort in class

### **Homework:**

There will be homework due every Discussion Lab meeting. All homework assignments are posted on the canvas webpage, and all homework is due electronically. Homework MUST be scanned or photographed and uploaded to canvas a minimum of 2 hours before your lab meeting (you lab instructor may require an earlier due time). If you do not have access to a camera, smart phone, or scanner, [scanners for public use are located in the Periodicals section of the Lower Level and at 2nd Floor Reference of the King Library](#). These scanners are used on a first-come-first-served basis, so please plan ahead. Online homework will have deadlines as listed on the canvas webpage.

In general, each homework assignment will be graded complete (100%), partially complete (50%), and below expectation or missing (0.0). There will be no intermediate grades. Students who earn a 'complete' grade have met expectations. They have completed their homework carefully and thoughtfully, and have made an effort to show that they understand the material. Correctness is considered, but not essential for homework assignments to receive a 'complete' grade. Students who earn a 'partially complete' grade have shown some thoughtfulness but have not made an effort to show the instructor that they understand the material. Work may be messy or

incomplete. Students who do not show work will earn no greater than a 'partially complete', and may earn zero points for the assignment. Students who do not attempt some portion of the problems will earn a below expectation or missing grade of zero. If an assignment is going to be graded differently than stated above, your lab instructor will notify you ahead of time.

I **strongly** encourage you to work together on your homework. However, copying will not be tolerated. You must be able to understand and defend anything you write on your assignment. There are spaces in the library for group work that you can reserve in advance. Instructions for how to do so can be found here:

<http://library.sjsu.edu/reserve-studymeeting-room/reserve-studymeeting-room>.

**Homework Tip 1: If you are stuck on a problem, do not leave it blank!** Write the things you've tried, the questions you have, and why you can't continue. If you prove that you've made some thoughtful progress, you will receive credit.

**Homework Tip 2:** Sometimes it's easy to forget what you were thinking when you look back at old assignments. Annotate your homework with your own notes on your thought process before you turn it in. This will help graders understand what you are thinking, and give you an excellent study guide later.

### **How to succeed in this course**

The critical thinking and communication skills you will use in this class will help you regardless of your career path. The physics principles you learn in this course apply to your other science courses and we will help you make those connections. We will do everything we can to help you succeed, but we cannot learn the material for you. Therefore, it is essential that you take responsibility for your own learning process.

[San José State University recommends 2 study hours per week per unit.](#) This means that you should schedule at least **8 hours** of time outside of class each week for doing physics. We strongly suggest breaking this up into at least three different chunks so that you are devoting time almost every day to physics. If you've done poorly in a math class before, or if you have never had high school physics, you will find that you will need to invest more time than that. If you miss class, you should schedule an additional 2-3 hours to cover on your own what you missed. Coming to office hours will help, but is not a substitute for coming to class.

Studying and problem-solving in groups is strongly recommended, but you should also schedule time to solve problems on your own. Most importantly: Do not fall behind! Every week builds on what we've done in the weeks before.

### **Office Hours**

We would love for you to attend office hours! Please stop in with any type of questions, be it homework or just general guidance. If the scheduled office hours do not work with your schedule, most instructors are happy to schedule an appointment with you. Please do not wait until the last minute before an exam to request to schedule an appointment, our schedules fill up quickly and we will likely be unavailable.

## **Communication**

The best way to get in touch with us outside of class or office hours is via email. However, we greatly prefer to answer content related questions in person, and depending on the nature of your question we may suggest that you attend office hours or schedule an appointment.

### **Classroom Protocol**

#### **2. Attendance:**

3. Lecture attendance is important. We will be using classroom polling systems, and we will also often engage in whole class and small group discussions during both lab and lecture. I will often provide opportunities to earn participation points. It will not be possible to make up these participation points if you miss the class they are assigned in.

If you know ahead of time that you will miss a lecture or discussion lab meeting, let one of your instructors know and we can either arrange for you to attend another lab section, and/or discuss how to make sure you are still prepared for the exams and homework. If you find that you have a situation that causes you to miss more than one or two classes, please contact me ASAP to figure out how to succeed in this course. If you already know that you will miss three or more meetings this semester, I would not recommend taking this course. If an illness or emergency causes you to miss an exam, please notify me ASAP. Make-up exams may involve a portion where you will be required to solve problems on a blackboard.

Please arrive on time to class. The room is crowded and it is distracting to your fellow students to clamber all over them to get an empty seat.

#### **Electronic devices:**

4. You may use calculators on all assignments (in-class, homework, and exams), unless otherwise specified. Please remember to keep your cell phones quiet (and stowed away) during class, unless you are using it for classroom polling. Please do not use your laptop computer during class, unless the classroom activity calls for it.

### **SJSU Peer Connections**

Peer Connections, a campus-wide resource for mentoring and tutoring, strives to inspire students to develop their potential as independent learners while they learn to successfully navigate through their university experience. You are encouraged to take advantage of their services which include course-content based tutoring, enhanced study and time management skills, more effective critical thinking strategies, decision making and problem-solving abilities, and campus resource referrals.

In addition to offering small group, individual, and drop-in tutoring for a number of undergraduate courses, consultation with mentors is available on a drop-in or by appointment basis. Workshops are offered on a wide variety of topics including preparing for the Writing Skills Test (WST), improving your learning and memory, alleviating procrastination, surviving your first semester at SJSU, and other related topics. A computer lab and study space are also available for student use in Room 600 of Student Services Center (SSC).

Peer Connections is located in three locations: SSC, Room 600 (10th Street Garage on the corner of 10<sup>th</sup> and San Fernando Street), at the 1st floor entrance of Clark Hall, and in the Living Learning Center (LLC) in

Campus Village Housing Building B. Visit [Peer Connections website](http://peerconnections.sjsu.edu) at <http://peerconnections.sjsu.edu> for more information.

## University Policies

### General Expectations, Rights and Responsibilities of the Student

5. As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the institution. Students are encouraged to familiarize themselves with SJSU's policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arises. See [University Policy S90-5](http://www.sjsu.edu/senate/docs/S90-5.pdf) at <http://www.sjsu.edu/senate/docs/S90-5.pdf>. More detailed information on a variety of related topics is available in the [SJSU catalog](http://info.sjsu.edu/web-dbgen/narr/catalog/rec-12234.12506.html), at <http://info.sjsu.edu/web-dbgen/narr/catalog/rec-12234.12506.html>. In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such conversation is not possible, or if it does not serve to address the issue, it is recommended that the student contact the Department Chair as a next step.

### Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage](http://www.sjsu.edu/provost/services/academic_calendars/) at [http://www.sjsu.edu/provost/services/academic\\_calendars/](http://www.sjsu.edu/provost/services/academic_calendars/). The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

### Consent for Recording of Class and Public Sharing of Instructor Material

[University Policy S12-7](http://www.sjsu.edu/senate/docs/S12-7.pdf), <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor's permission to record the course and the following items to be included in the syllabus:

- “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”
  - It is suggested that the greensheet include the instructor's process for granting permission, whether in writing or orally and whether for the whole semester or on a class by class basis.
  - In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
- “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

## **Academic integrity**

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The [University Academic Integrity Policy S07-2](http://www.sjsu.edu/senate/docs/S07-2.pdf) at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

## **Campus Policy in Compliance with the American Disabilities Act**

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential Directive 97-03](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at [http://www.sjsu.edu/president/docs/directives/PD\\_1997-03.pdf](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) requires that students with disabilities requesting accommodations must register with the [Accessible Education Center](http://www.sjsu.edu/aec) (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.

## **Accommodation to Students' Religious Holidays**

San José State University shall provide accommodation on any graded class work or activities for students wishing to observe religious holidays when such observances require students to be absent from class. It is the responsibility of the student to inform the instructor, in writing, about such holidays before the add deadline at the start of each semester. If such holidays occur before the add deadline, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent. It is the responsibility of the instructor to make every reasonable effort to honor the student request without penalty, and of the student to make up the work missed. See [University Policy S14-7](http://www.sjsu.edu/senate/docs/S14-7.pdf) at <http://www.sjsu.edu/senate/docs/S14-7.pdf>.

## **Student Technology Resources**

Computer labs for student use are available in the [Academic Success Center](http://www.sjsu.edu/at/asc/) at <http://www.sjsu.edu/at/asc/> located on the 1st floor of Clark Hall and in the Associated Students Lab on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library. A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include DV and HD digital camcorders; digital still cameras; video, slide and overhead projectors; DVD, CD, and audiotape players; sound systems, wireless microphones, projection screens and monitors.

## **SJSU Counseling Services**

The SJSU Counseling Services is located on the corner of 7<sup>th</sup> Street and San Fernando Street, in Room 201, Administration Building. Professional psychologists, social workers, and counselors are available to provide consultations on issues of student mental health, campus climate or psychological and academic issues on an individual, couple, or group basis. To schedule an appointment or learn more information, visit [Counseling Services website](http://www.sjsu.edu/counseling) at <http://www.sjsu.edu/counseling>.



## Physics 2A: Foundations of Physics, FALL 2018

*The schedule will serve as a guideline for the order of topics in covered in this class. It is subject to change with reasonable notice. Please see the canvas website for the most up-to-date information.*

Dates	Meeting	Topic	Activities	Prep HW	Exams
Aug 21	1	None	none	none	-----
Aug 22, 23	2	Syllabus	1a,b,c	none	-----
Aug 24, 27, 28	3	Thermo Energy	3,4,5,6	6.1,2, 7.1,2	-----
Aug 29, 30	4	Thermo Energy	7,8,9	9.1,2,3,4,5,6,7	-----
Aug 31, Sept 4	(Labor Day)	-----	none	none	-----
Sept 5, 6	5	Thermo Energy	10, 11	10.1,2,3,4,5,6	-----
Sept 7, 10, 11	6	Mechanical Energy	12, 13	none	Thermo Quiz
Sept 12, 13	7	Mechanical Energy	14	14.1,2	-----
Sept 14, 17, 18	8	Mechanical Energy	15, 16	17.1,2,3	-----
Sept 19, 20	9	Mechanical Energy	17,18	17.4,5,6	-----
Sept 21, 24, 25	10	Mechanical Energy	19, 20	20.1,2,3,4,5,6	Mech Quiz
Sept 26, 27	11	Mechanical Energy	21, 22	22.1,2,3	-----
Sept 28 Oct 1, 2	12	Vectors/ Momentum	23a,b,c, 29, 30		Midterm
Oct 3 and 4	13	Vectors	24, 25	25.1,2,3,4	-----
Oct 5, 8, 9	14	Vectors	26, 27	28.1,2,3	-----
Oct 10, 11	15	Momentum/ Impulse	31, 33	31.1,2,3	-----
Oct 12, 15, 16	16	Momentum/ Impulse	32, 34a	32.1,2,3	Quiz Vectors
Oct 17, 18	17	Forces	34.d, 36a,b,c	34.2,3,4,5,6	-----
Oct 19, 22, 23	18	Forces	35	35.1,2,3,4,5,6	-----
Oct 24. 25	19	Momentum	36c,d, 37	36.2,3	-----
Oct 26, 29, 30	20	Kinematics	38, 39	38.1,2,3, 39.1,2	Force Momentum Quiz
Oct 31, Nov 1	21	Kinematics/Forces	39, 41	39.3,4,5	-----
Nov 2, 5, 6	22	Projectile Motion	41, 42	41.1, 42.1	-----
Nov 7 and 8	23	Circular Motion	TBD	TBD	-----
Nov 9, 13	(Veteran's Day)	-----	none	none	Kinematics Quiz
Nov 14, 15	24	Circular Motion	40	TBD	-----
Nov 16, 19, 20	25	Angular Momentum	TBD	TBD	-----
Nov 26, 27	(Thanksgiving)	-----	none	none	-----
Nov 28, 29	26	Torque/ Angular Impulse	TBD	TBD	-----
Nov 30, Dec 3, 4	27	Torque/ Angular Impulse	TBD	TBD	Circular Quiz
Dec 5 and 6	28	Combining Ideas	43	TBD	-----
Dec 7, 10	(Review Days)	-----	none	none	-----

## Lecture Schedule

<b>Date</b>	<b>Topic</b>	<b>Exams</b>
Aug 24 2018	Scalars and Vectors	
Aug 31 2018	Three Phase Model/ EID	
Sep 7 2018	Advanced Thermo Problems	Thermo Quiz
Sep 14 2018	Mechanical Energy Problems	
Sep 21 2018	More mechanical energy Problems	Mech Quiz
Sep 28 2018	Mechanical energy and Forces	
Oct 5 2018	No Lecture, Only Exam	
Oct 12 2018	Force addition/ Newton's Second Law	Vector Addition Quiz
Oct 19 2018	Momentum Conservation and Forces	
Oct 26 2018	Displacement/ Linear motion	Force/ Momentum Impulse Quiz
Nov 2 2018	Motion Graphs	
Nov 9 2018	Projectile motion	Kinematics Quiz
Nov 16 2018	Circular motion across the units	
Nov 23 2018	Thanksgiving	
Nov 30 2018	How do we know which model to use?	Circular Topics Quiz
Dec 7 2018	Combining Units	
Dec 17 2018	7:15-930 am	Final Exam

NOTE: This schedule is tentative and may be modified to reflect the needs of the class.