



**Division of Natural Sciences and Horticulture  
Physics Department**

<http://learning.hccs.edu/programs/physics>

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**PHYS 1401: College Physics I | Lecture/Lab | #13926**

Fall 2020 | Regular Term (8.24.2020-12.13.2020)

Hybrid/Half Class per Session | MoWe 3:00-5:50 p.m. | FM 220

4 Credit Hours | 96 hours per semester

**Instructor Contact Information**

**Instructor:** Aaron Marks, Ph.D.

Office Phone: 713-718-5657

**Office:** Virtual via Canvas

Office Hours: TuFr 10:00-11:30 a.m.

**HCC Email:** [aaron.marks@hccs.edu](mailto:aaron.marks@hccs.edu)

Please feel free to contact me concerning any problems that you are experiencing in this course. Your performance in my class is very important to me. I am available to hear your concerns and discuss course topics with you.

**Instructor's Preferred Method of Contact**

You may reach me via email (preferably) or phone. **Please use your student HCCS.edu email for communication.** I will only send correspondence to your student account so please check it regularly as you are responsible for content of messages. Students may access email via Canvas or student sign-ins. Please allow sufficient time for a response. I will respond to emails within 24 hours Monday through Friday; I will reply to weekend messages at some time before or on Monday morning.

**What's Exciting About This Course**

Physics is the study of the entire universe and everything in it, from the smallest subatomic particles to enormous objects such as planets, stars and even entire galaxies. Physics is how we describe the motion of objects, topics such as electricity, magnetism and light and study energy in its various forms (for example, mechanical or thermal). It is amazing that the universe works in a way that we, as curious human beings, can describe, explain and even predict how phenomena occur in the world around us. Certainly, this sounds exciting to me and hopefully to you as well!

**My Personal Welcome**

Welcome to College Physics I—I'm delighted that you have chosen this course! One of my passions is to know as much as I can about the universe around me, and I can hardly wait to pass that knowledge on. I will present these physical principles in the most exciting way I

know, so that you can grasp the concepts and apply them now and hopefully throughout your life.

As you read and wrestle with new ideas and facts that may challenge you, I am available to support you. The fastest way to reach me is by my HCC email. This class is as much an exercise in critical thinking and problem solving as it is in any particular theory or principle. The best way to improve your problem solving skills is to work as many problems as you can. My goal is for you to walk out of the course with a better understanding of yourself and the universe around you. So please visit me or contact me by email whenever you have a question.

### **Prerequisites and/or Co-Requisites**

PHYS 1401 requires college-level reading and writing skills. Research indicates that you are most likely to succeed if you have already taken and passed ENGL 1301. The minimum requirements for enrollment in PHYS 1401 include MATH 1314 or 1414 College Algebra AND MATH 1316 Plane Trigonometry or MATH 2312 or 2412 Pre-Calculus. If you have enrolled in this course having satisfied these prerequisites, you have a higher chance of success than students who have not done so. Please carefully read and consider the repeater policy in the [HCCS Student Handbook](#).

### **Canvas Learning Management System**

This course will use Canvas for all lecture content. Course materials including, but not limited to, the syllabus, Lecture PowerPoint files, Online materials, Homework assignments, Practice problems, Sample solutions, Formula sheets, notices, links to useful physics material etc. will be posted on Canvas.

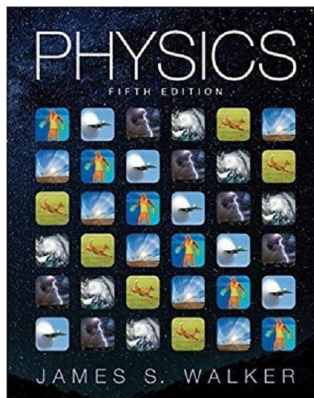
Messages for the class will be posted in "Announcements" in canvas, so check that often. Additionally, Canvas may be used for class communications by using the "Inbox".

The Syllabus is also available on the Learning Web. My Learning Web page is located at (<http://learning.hccs.edu/faculty/aaron.marks>).

HCCS Open Lab locations may be used to access the Internet and Canvas, or you may use your own computer. **USE FIREFOX OR CHROME AS THE INTERNET BROWSER.**

## Instructional Materials

### Textbook Information



The textbook listed below is **required** for this course.  
**Physics** (5<sup>th</sup> ed.), Volume 1 by James S. Walker (ISBN 978-134-03124-8)

The book is included in a package that contains the text as well as an access code and is found at the [HCC Bookstore](#). You may either use a hard copy of the book, or rent the e-book from Pearson. Order your book here: [HCC Bookstore](#)

### Tutoring

HCC provides free, confidential, and convenient academic support, including writing critiques, to HCC students in an online environment and on campus. Tutoring is provided by HCC personnel in order to ensure that it is contextual and appropriate. Visit the [HCC Tutoring Services](#) website for services provided.

### Libraries

The HCC Library System consists of 9 libraries and 6 Electronic Resource Centers (ERCs) that are inviting places to study and collaborate on projects. Librarians are available both at the libraries and online to show you how to locate and use the resources you need. The libraries maintain a large selection of electronic resources as well as collections of books, magazines, newspapers, and audiovisual materials. The portal to all libraries' resources and services is the HCCS library web page at <http://library.hccs.edu>.

### Supplementary Instruction

Supplemental Instruction is an academic enrichment and support program that uses peer-assisted study sessions to improve student retention and success in historically difficult courses. Peer Support is provided by students who have already succeeded in completion of the specified course, and who earned a grade of A or B. Find details at <http://www.hccs.edu/resources-for/current-students/supplemental-instruction/>.

## Course Overview

First semester of a two semester, non-calculus based introductory physics course. Topics include forces and motion, work and energy, momentum, oscillations and waves, and thermal properties of matter.

### Core Curriculum Objectives (CCOs)

PHYS 1401 satisfies the physical science requirement in the HCCS core curriculum. The HCCS Physics Discipline Committee has specified that the course address the following core objectives:

- **Critical Thinking:** Students will demonstrate the ability to engage in inquiry and analysis, evaluation and synthesis of information, and creative thinking by

demonstrating problem solving skills on homework and exams.

- **Communication Skills:** Students will demonstrate effective development, interpretation and expression of ideas through written, and visual communication.
- **Quantitative and Empirical Literacy:** Students will demonstrate the ability to draw conclusions based on the systematic analysis of topics using observation, experiment, and/or numerical skills by completing textbook reading assignments, completing assignments, and answering questions on quizzes and/or exams.

### Program Student Learning Outcomes (PSLOs)

1. To provide the student a basic and practical understanding of physics and recognize its relevance in our daily lives.
2. To prepare our students for success in higher level physics courses to satisfy their major requirements and prepare them for success in other science courses when they transfer to four-year colleges and universities.
3. To enhance class lectures with related, hands-on laboratory experience of setting up and performing the experiments, gathering related data, analyzing and evaluating the results, drawing conclusions and writing acceptable reports with involvements of lab group members or as individuals; and drawing conclusions thereby fostering collaborative learning.

### Course Student Learning Outcomes (CSLOs)

Upon completion of PHYS 1401, the student will be able to:

1. Analyze motion in one and two dimensions.
2. Apply the laws of motion to the solution of dynamics problems
3. Use conservation laws as alternative tools to solve dynamics problems.
4. Use the laws of physics to analyze rotational motion.
5. Apply the properties of fluids at rest and fluid flow to simple everyday life situations.
6. State the laws of thermodynamics and apply them to simple problems.
7. Conduct simple experiments in mechanics and thermal physics.

### Learning Objectives

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

- 1.1 Solve simple problems on motion in one and two dimensions.
- 1.2 Identify and apply an appropriate kinematics equation as applied to motion with constant acceleration.
- 1.3 Relate motion of a free fall object to that of a projectile motion.
- 2.1 State the three Newton's Laws of motion.
- 2.2 Apply Newton's Laws of motion to the analysis of motion of objects in equilibrium as well as to non-equilibrium situations.
- 2.3 State the law of Universal Gravitation and use it to determine the weight of an object.
- 3.1 State the Work-Kinetic Energy Theorem and apply it to the solution of Dynamics problems.
- 3.2 Distinguish between various types of energy forms.

- 3.3 Define conservative and non-conservative forces.
- 3.4 Apply the law of Conservation of Energy as an alternative to Newton's laws of motion
- 4.1 Solve simple problems involving rotational kinematics.
- 4.2 State the two conditions for equilibrium and use them to analyze a particle in equilibrium.
- 4.3 Apply conservation laws to simple everyday activities.
- 5.1 Explain the physical basis of buoyancy.
- 5.2 Use the Continuity and Bernoulli's equations to solve problems involving fluid flow.
- 6.1 Define temperature and convert temperature from one scale to another (Example Celsius to Fahrenheit).
- 6.2 Calculate thermal expansion of solids and liquids.
- 6.3 Determine the amount of thermal energy gained or lost as a result of temperature change or phase transitions.
- 6.4 Use the laws of thermodynamics to analyze the change in thermodynamic state of a system.
- 7.1 Collect and analyze data from a given experiment.
- 7.2 Write a laboratory report following standard scientific laboratory report writing.

## **Student Success**

Expect to spend at least twice as many hours per week outside of class as you do in class studying the course content. Additional time will be required for written assignments. The assignments provided will help you use your study hours wisely. Successful completion of this course requires a combination of the following:

- Reading the textbook
- Logging in to the Canvas site and checking your HCC email daily
- Completing assignments
- Participating in class activities

There is no short cut for success in this course; it requires studying the material and solving problems.

## **Instructor and Student Responsibilities**

As your Instructor, it is my responsibility to:

- Provide the grading scale and detailed grading formula explaining how student grades are to be derived
- Facilitate an effective learning environment through learner-centered instructional techniques
- Provide a description of any special projects or assignments
- Inform students of policies such as attendance, withdrawal, tardiness, and making up assignments
- Provide the course outline and class calendar that will include a description of any special projects or assignments
- Arrange to meet with individual students before and after class as required

As a student, it is your responsibility to:

- Log in to Canvas and check the site for new messages/announcements daily
- Participate actively by reviewing course material, interacting with classmates, and responding promptly in your communication with me

- Participate actively in performing the Lab experiments with your group-mates
- Read and comprehend the textbook
- Complete the required assignments and exams
- Ask for help when there is a question or problem
- Keep copies of all paperwork, including this syllabus, handouts, and all assignments
- Be aware of and comply with academic honesty policies in the HCCS Student Handbook

## Assignments, Exams, and Activities

### Homework Assignments

Problems are assigned from the text after every chapter is covered. Students are strongly advised to attempt all these selected problems and other problems from the text. In general, students who fail to do these assigned problems will not do well in the course. **Homework assignments are to be submitted via Canvas on or before the day they are due to be counted for full credit.** Each homework assignment will open up for online submission a few days before it is due. Please take scans or pictures of your work and submit it to Canvas. Homework submissions must be in a readable file format (such as a pdf or jpeg file) to get credit. In particular, heic files will not be accepted. Email submissions will not be accepted! Late homework is accepted for half credit (until the date of the final class session). Homework can be done collaboratively but every student is responsible for submitting their own solutions. All work necessary in obtaining a solution should be shown to receive full credit.

### Laboratory Procedures

Until October 5<sup>th</sup>, the laboratory portion of this course will be performed by using lab simulations and/or data analysis activities. These will be completely online and submissions must be made via Canvas. Every student will be responsible for submitting the work required for each lab activity, group reports will not be used. Lab report submissions must be in a readable file format (such as a pdf or jpeg file) to get credit. Email submissions will not be accepted! Lab activities will only be open for a limited time window in Canvas and reports must be submitted before the associated lab is closed. Late lab reports are not accepted! These activities will replace the normal lab report grades.

After October 5<sup>th</sup>, labs will be performed in-person, on campus. Half the class (9 students) will be required to attend an assigned lab session (either Monday or Wednesday). Lab time will be used for setting up equipment, taking data, calculating results and disassembling equipment. Other activities include coordination with partners, assisting in calculations, data analysis, cleanup of lab area, etc. Students observed goofing off will be penalized. Note that this is subject to change due to the ongoing pandemic.

### Exams

Exams will be given using the Quiz feature on Canvas however; the exact format of the exams is yet to be determined. Students will submit their work on the exam using Canvas. Email submissions will not be accepted! The purpose of the exam is to test knowledge of the principles and theories presented during class. Exam problems will be similar (*not the same!*) as worked examples or problems from the homework. Exam grades may be curved, if needed. **No exam grade is ever dropped!**

There are no make-up exams, therefore, make every effort to take exams on their scheduled date. **If an exam is missed, a zero will be recorded for that exam grade!!** In extremely rare circumstances, if a valid excuse has been approved (by the instructor), the corresponding section on the final exam will count as both parts of your final exam grade as well as the missed exam grade.

## Final Exam

All students will be required to take a comprehensive final exam. Students who are absent from the final exam will receive a failing course grade. The time and date of the final exam is listed on HCC's website at <https://www.hccs.edu/student-experience/events-calendar/> . The final exam will only be administered during the time and date given by HCC's Final Exam Schedule.

## Grading Formula

The final grade is based on the total possible score of 100%, which the student can accumulate from all tests, class work, homework, and the final exam. Exam grades may be curved however homework, laboratory and the total class grade are generally not curved.

**Extra credit will not be given for any reason.**

### Grading Scale:

Two Mid-Term Exams (20% each):	40%
Homework:	20%
Laboratory Sessions:	15%
Final Exam (mandatory):	25%

Grading Scale:	A = 90 – 100%
	B = 80 – 89%
	C = 70 – 79%
	D = 60 – 69%
	F > 60

**HCC Grading Scale can be found on this site under Academic Information:**  
<http://www.hccs.edu/resources-for/current-students/student-handbook/>

## Course Calendar

This is a rough outline of the expected course content. Anything and everything is subject to change. Homework is assigned from the "Problems and Conceptual Exercises" section at the end of each chapter. Late homework is accepted but at half credit.

Date	Topic	Chapter	Homework	Lab
8/24	Welcome, Introduction, Units	1	<b>Hwk 1</b> (due 9/2) Ch. 1 – 2, 7, 13, 24, 25, 34, 41, 50	
8/26				
8/31	Motion in 1D	2	<b>Hwk 2</b> (due 9/9) Ch. 2 – 1, 14, 32, 33, 40, 48, 54, 71, 82, 84, 85	CL1
9/2				CL1
9/7	<b>No Class</b>			

9/9	Vectors	3	<b>Hwk 3</b> (due 9/16) Ch. 3 – 8, 9, 11, 27, 28b, 34, 39, 43	
9/14	Motion in 2D, Projectiles	4	<b>Hwk 4</b> (due 9/23) Ch. 4 – 4, 5, 6, 14, 17, 21, 32, 38, 39, 50	CL2
9/16				CL2
9/21	Forces, Newton's Laws	5	<b>Hwk 5</b> (due 9/30) Ch. 5 – 3, 5, 21, 29, 31, 45, 46, 47, 62	CL3
9/23				CL3
9/28	Friction, Circular Motion	6	<b>Hwk 6</b> (due 10/5) Ch. 6 – 4, 8, 11, 17, 25, 27, 43, 48, 65, 72, 73	CL4
9/30				CL4
10/5	Review 1			
10/7	<b>Exam 1</b>	Ch. 1 – 6		
10/12	Work, Energy	7, 8	<b>Hwk 7</b> (due 10/19) Ch. 7 – 4, 10, 17, 18, 26, 29, 32, 42, 43 <b>Hwk 8</b> (due 10/21) Ch. 8 – 2, 3, 10, 23, 25, 28, 35, 60, 66, 67	M1
10/14				W1
10/19	Conservation of Momentum, Collisions	9	<b>Hwk 9</b> (due 10/26) Ch. 9 – 4, 6, 16, 19, 23, 26, 31, 32, 40, 66	M2
10/21				W2
10/26	Rotation	10, 11	<b>Hwk 10</b> (due 11/2) Ch. 10 – 3, 16, 17, 21, 26, 28, 47, 48, 59, 61, 63 <b>Hwk 11</b> (due 11/4) Ch. 11 – 1, 6, 10, 12, 23, 26, 30, 42, 54, 55, 77, 80	M3
10/28				W3
11/2	Gravity	12	<b>Hwk 12</b> (due 11/9) Ch. 12 – 2, 3, 14, 17, 25, 26, 30, 36, 37, 48, 55	M4
11/4				W4
11/9	Review 1			
11/11	<b>Exam 2</b>	Ch. 7 – 12		
11/16	Oscillations	13	<b>Hwk 13</b> (due 11/23) Ch. 13 – 1, 6, 10, 14, 21, 22, 48, 49, 57, 58	M5
11/18				W5
11/23	Waves and Sound	14	<b>Hwk 14</b> (due 11/30) Ch. 14 – 4, 14, 20, 24, 35, 37, 42, 45, 48	
11/25				
11/30	Temperature and Heat	16	<b>Hwk 15</b> (due 12/2) Ch. 16 – 4, 6, 17, 22, 29, 31, 36, 37, 54	M6
12/2	Final Review		Last day to submit late homework!	W6
12/7	<b>Final Exam</b>	Ch. 1 – 14, 16		



## **Syllabus Modifications**

The instructor reserves the right to modify the syllabus at any time during the semester and will promptly notify students in writing, typically by e-mail, of any such changes.

## **Instructor's Practices and Procedures**

### **Missed Assignments**

*Homework assignments are to be turned in by the due date to be counted for full credit. Late homework is accepted for half credit (until the date of the final class session before the final exam). Late lab work is not accepted for any reason!*

### **Academic Integrity**

You are expected to be familiar with the College's Policy on Academic Honesty, found in the catalog. What that means is: If you are charged with an offense, pleading ignorance of the rules will not help you. Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements.

Here's the link to the HCC information about academic integrity (Scholastic Dishonesty and Violation of Academic Scholastic Dishonesty and Grievance):

<http://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-procedures/>

### **Attendance Procedures**

HCC's Attendance Policy is stated in Students Handbook as follows: *"You are expected to attend all lecture classes and labs regularly. You are also responsible for materials covered during your absences. Instructors may be willing to consult with you for make-up assignments, but it is your responsibility to contact the instructor. Class attendance is checked daily. Although it is your responsibility to drop a course for nonattendance, the instructor has the authority to drop you for excessive absences. You may be dropped from a course after accumulating absences in excess of 12.5 percent of the total hours of instruction (lecture and lab). For example:*

- *For a three credit-hour lecture class meeting three hours per week (48 hours of instruction), you can be dropped after six hours of absence.*
- *For a four credit-hour lecture/lab course meeting six hours per week (96 hours of instruction), you can be dropped after 12 hours of absence."*

If circumstances significantly prevent you from attending classes, please inform the instructor.

### **Electronic Devices**

The use of electronic devices (cell phones, laptops, etc.) by students in the classroom is up to the discretion of the instructor. Any use of such devices for purposes other than student learning is strictly prohibited. If an instructor perceives such use as disruptive and/or inappropriate, the instructor has the right to terminate such use. If the behavior continues, the student may be subject to disciplinary action to include removal from the classroom.

If students choose to use laptops or tablets (or other electronic device with wifi, cellular or Communication capabilities including cell phones and watches), they should be for classroom related purposes only and during times permitted.

Cell phones are not calculators and will not be permitted to be used as a calculator during exams.

## Physics Program Information

Please visit the [Physics Program page on the HCCS website](https://www.hccs.edu/programs/areas-of-study/science-technology-engineering--math/physics/) for information regarding degree offerings, requirements, employment prospects and more.

<https://www.hccs.edu/programs/areas-of-study/science-technology-engineering--math/physics/>

## HCC Policies

Here's the link to the HCC Student Handbook <http://www.hccs.edu/resources-for/current-students/student-handbook/> In it you will find information about the following:

- Academic Information
- Academic Support
- Attendance, Repeating Courses, and Withdrawal
- Career Planning and Job Search
- Childcare
- disAbility Support Services
- Electronic Devices
- Equal Educational Opportunity
- Financial Aid TV (FATV)
- General Student Complaints
- Grade of FX
- Incomplete Grades
- International Student Services
- Health Awareness
- Libraries/Bookstore
- Police Services & Campus Safety
- Student Life at HCC
- Student Rights and Responsibilities
- Student Services
- Testing
- Transfer Planning
- Veteran Services

## EGLS<sup>3</sup>

The EGLS<sup>3</sup> (Evaluation for Greater Learning Student Survey System) will be available for most courses near the end of the term until finals start. This brief survey will give invaluable information to your faculty about their teaching. Results are anonymous and will be available to faculty and division chairs after the end of the term. EGLS<sup>3</sup> surveys are only available for the Fall and Spring semesters. EGLS<sup>3</sup> surveys are not offered during the Summer semester due to logistical constraints.

<http://www.hccs.edu/resources-for/current-students/egls3-evaluate-your-professors/>

## Campus Carry Link

Here's the link to the HCC information about Campus Carry:

<http://www.hccs.edu/departments/police/campus-carry/>

## HCC Email Policy

When communicating via email, HCC requires students to communicate only through the HCC email system to protect your privacy. If you have not activated your HCC student email account, you can go [to HCC Eagle ID](#) and activate it now. You may also use Canvas Inbox to communicate.

## Housing and Food Assistance for Students

Any student who faces challenges securing their foods or housing and believes this may affect their performance in the course is urged to contact the Dean of Students at their

college for support. Furthermore, please notify the professor if you are comfortable in doing so.

This will enable HCC to provide any resources that HCC may possess.

## **Office of Institutional Equity**

Use the link below to access the HCC Office of Institutional Equity, Inclusion, and Engagement (<http://www.hccs.edu/departments/institutional-equity/>)

### **disAbility Services**

HCC strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including long and short term conditions, mental health, chronic or temporary medical conditions), please meet with a campus Abilities Counselor as soon as possible in order to establish reasonable accommodations. Reasonable accommodations are established through an interactive process between you, your instructor(s) and Ability Services. It is the policy and practice of HCC to create inclusive and accessible learning environments consistent with federal and state law. For more information, please go to <http://www.hccs.edu/support-services/disability-services/>

### **Title IX**

Houston Community College is committed to cultivating an environment free from inappropriate conduct of a sexual or gender-based nature including sex discrimination, sexual assault, sexual harassment, and sexual violence. Sex discrimination includes all forms of sexual and gender-based misconduct and violates an individual's fundamental rights and personal dignity. Title IX prohibits discrimination on the basis of sex-including pregnancy and parental status in educational programs and activities. If you require an accommodation due to pregnancy please contact an Abilities Services Counselor. The Director of EEO/Compliance is designated as the Title IX Coordinator and Section 504 Coordinator. All inquiries concerning HCC policies, compliance with applicable laws, statutes, and regulations (such as Title VI, Title IX, and Section 504), and complaints may be directed to:

David Cross  
Director EEO/Compliance  
Office of Institutional Equity & Diversity  
3100 Main  
(713) 718-8271  
Houston, TX 77266-7517 or [Institutional.Equity@hccs.edu](mailto:Institutional.Equity@hccs.edu)  
<http://www.hccs.edu/departments/institutional-equity/title-ix-know-your-rights/>

### **Office of the Dean of Students**

Contact the office of the Dean of Students to seek assistance in determining the correct complaint procedure to follow or to identify the appropriate academic dean or supervisor for informal resolution of complaints.

<https://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-complaints/speak-with-the-dean-of-students/>

**Department Chair Contact Information**

Department Chair: Dr. Kumela Tafa, [kumela.tafa@hccs.edu](mailto:kumela.tafa@hccs.edu), 713-718-5569

Department Chair's Secretary: Ms. Nettie Muhammad, [nettie.muhammad@hccs.edu](mailto:nettie.muhammad@hccs.edu), 713-718-6050.