



**HOUSTON COMMUNITY COLLEGE  
NORTHWEST COLLEGE  
PHYSICS 1401: COLLEGE PHYSICS I  
Spring 2015  
Class Number 43214**

**Time:** 1:00 – 4:00 am, Monday and Wednesday

**Location:** Spring Branch Campus, Room 610

**Textbook:** James S. Walker, *Physics*, 4<sup>th</sup> ed., Volume 1 (ISBN 978-0-321-61111-6)

**Instructor:** Aaron Marks

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

**Office Hours:** By appointment only

### **Learning Web Page:**

Important course materials such as this syllabus, the homework schedule and exam reviews can be found on my learning web page. (<http://learning.hccs.edu/faculty/aaron.marks>)

### **Course Description:**

*Prerequisites:* MATH 1314 and MATH 1316

A non-calculus based course. Topics include forces and motion, work and energy, momentum, oscillations and waves, and thermal properties of matter.

**Homework Assignments:** Practice 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 turned in at the start of class on the day they are due to be counted for full credit. Late homework is accepted (until the date of the final exam) but at half credit. 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.

**Exam Procedures:** During exams, all book bags, satchels, cellphones, notebooks, laptops etc. will be placed at the side of the desk. Visits to the restroom will be limited. All exams are closed book and note. An equation sheet will be provided for each exam. 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 examples worked during class or problems from the homework. Exam grades will be curved.

**Make-up Exams:** *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, the corresponding section on the final exam will count as both parts of your final exam grade as well as the missed exam grade. Should you miss more than one exam, you will be dropped from the course.

**Academic Responsibility:** Please refer to the Student Handbook concerning grievances, complaints, discipline (including student conduct), and scholastic dishonesty and student rights. Please contact me if you require any reasonable accommodation to achieve your academic responsibilities.

**Cell phones and beepers:** All cell phones and pagers should be set on “silent” or “vibrate” during class times. If a student is observed talking, texting, playing games, etc. on a cell phone during class they may be asked to leave.

**Recording:** Absolutely no recording of any sort unless otherwise recommended by ADA office.

### **Final course grade:**

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 will be curved however homework, laboratory and the total class grade are generally not curved.

### **Grading Scale:**

Two Mid-Term Exams (20% each):	40%
Homework:	20%
Laboratory Sessions:	10%
Module Exercise:	5%
Final Exam (mandatory):	25%

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

### **Withdrawal Policy:**

Be certain you understand HCC policies about dropping a course. It is your responsibility to withdraw officially from a class and prevent an “F” from appearing on your transcript. When considering withdrawal from a course, remember that:

- No grade is given and your transcript reflects no record of the course if you withdraw before the Official Date of Record.
- A “W” (indicating withdrawal) appears on your transcript if you drop a course after the Official Date of Record and before the final deadline.
- The final deadline to drop a course is four weeks before fall or spring semester finals and one week before summer semester exams

### **Attendance Policy:**

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.

### Disability Support Services (DSS):

Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office (713-718-5422) at the beginning of each semester. Faculty members are authorized to provide only the accommodations requested by the Disability Support Services Office.

### Tentative Class Schedule:

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
1/21	Introduction, Units, Displacement and Velocity	1	<b>Hwk 1</b> (due 1/28) Ch. 1 – 2, 5, 12, 24, 27, 28, 35, 42
1/26	<b>No Class</b>		
1/28	1D Motion	2	<b>Hwk 2</b> (due 2/4) Ch. 2 – 1, 14, 33, 35, 43, 56, 75, 88, 90, 92
2/2	Vectors, 2D Motion	3, 4	<b>Hwk 3</b> (due 2/11) Ch. 3 – 6, 12, 20, 26b, 32, 33, 40, 41 Ch. 4 – 4, 5, 12, 15, 32, 35, 53
2/4	Lab 1		
2/9	Forces, Newton’s Laws	5	<b>Hwk 4</b> (due 2/18) Ch. 5 – 3, 11, 16, 19, 25, 30, 36, 45, 50a
2/11	Module Experiment		
2/16	<b>No Class</b>		
2/18	Lab 2		
2/23	Friction, Circular Motion	6	<b>Hwk 5</b> (due 3/2) Ch. 6 – 3, 4, 10, 11, 22, 26, 36, 37, 55, 59
2/25	Lab 3		
3/2	Review 1 (Module Presentations)		
3/4	<b>Exam 1</b>	Ch. 1 – 6	
3/9	Conservation of Mechanical Energy	7, 8	<b>Hwk 6</b> (due 3/25) Ch. 7 – 4, 11, 19, 21, 30, 46, 47 Ch. 8 – 10, 14, 29, 31, 33, 41, 44, 47, 81
3/11	Lab 4		
3/16	<b>No Class</b>		
3/18	<b>No Class</b>		
3/23	Conservation of Momentum, Collisions	9	<b>Hwk 7</b> (due 4/1) Ch. 9 – 3, 5, 13, 14, 18, 22, 25, 31, 42
3/25	Lab 5		
3/30	Rotational Kinematics	10	
4/1	Rotational Dynamics	11	<b>Hwk 8</b> (due 4/8) Ch. 10 – 16, 19, 25, 30, 37, 49, 55, 57, 70, 72a

			Ch. 11 – 1, 3, 5ab, 10, 12, 25, 30, 65, 67, 100
4/6	Gravity	12	<b>Hwk 9</b> (due 4/13) Ch. 12 – 4, 6, 15, 29, 31, 40, 43, 51, 58, 88
4/8	Lab 6		
4/13	Review 2		
4/15	<b>Exam 2</b>	Ch. 7 – 12	
4/20	Oscillations	13	<b>Hwk 10</b> (due 4/27) Ch. 13 – 2, 6, 10, 14, 23, 26, 47, 49, 60, 62
4/22	Lab 7		
4/27	Waves and Sound	14	<b>Hwk 11</b> (due 5/4) Ch. 14 – 4, 14, 20, 23, 32, 35, 40, 45, 48
4/29	Lab Make Up		
5/4	Temperature and Heat	16	<b>Hwk 12</b> (due 5/6) Ch. 16 – 3, 5, 17, 21, 27, 33, 35, 51
5/6	Final Review		
5/11	<b>Final Exam</b>		

## **Problem Solving in Physics:**

Physics is a lot like driving or swimming - you have to learn by doing it. You could read a book on driving and memorize every word in it, but when you are behind the wheel the first time you are going to have hard time to coordinate what you memorize in practice. After some training you will find that driving is the easiest thing to do. Similarly, you can read your text book and/or your note book carefully; memorize every equation and formula in it but when you finish you still have not learned physics. To learn physics you have to go beyond passive reading; you have to interact with physics and experience it by doing (solving) problems. Below is presented a brief summary of problem solving steps in physics. The suggestions should help to develop a systematic approach in problem solving. It should be underlined that at the outset that there is no recipe for solving problems in physics --- it is a creative activity. In fact the opportunity to be creative is one of the attractions in physics. The following suggestions then are not intended as a rigid set of steps that must be followed like steps in computer programming. Rather, they provide a general guideline that experienced problem solvers find to be effective.

**Read the problem carefully** Before you can solve a problem you need to know exactly what information it gives and what it asks you to determine. This is essential first step in problem solving.

**Sketch the system** You may say that this is not that important. It is important and worth doing it. A sketch helps you to acquire a physical feeling for what is going on. It also provides an opportunity to label those quantities that are known and those that are not determined. A good sketch is often the key to determining how to go about solving a problem.

**Visualize the physical process** This may be the most difficult, but at the same time the most creative, part of the problem -solving process. From your sketch and visualization, try to identify the physical process at work in the system. Then develop a strategy -a game plan - for solving the problem.

**Identify appropriate equations** Once a plan/strategy has been developed, find the appropriate equations to carry it out.

**Solve the equations** Use basic algebra to solve the equations identified in the previous step. Work with variables at first only substituting numerical values near the end of the calculations.

**Check your answers** Once you have an answer, check to see if it makes sense: (i) Does it have the right dimension? If you determine force the dimension should not be in seconds! (ii) Is the numerical value reasonable? 10/100 should not give a 1000!!!

### **Explore limits/special cases**

Finally, it is tempting to look for shortcuts when doing a problem -- to look for a formula that seems to fit and some numbers to plug into it. It may seem harder to think ahead, to be systematic as you solve the problem, and then to think back over what you have done at the end of the problem. The extra effort is worth it, however, because by doing these things you will develop powerful problem - solving skills that can be applied to unexpected problems you may encounter on exams --- in life in general!!