



**HOUSTON COMMUNITY COLLEGE
NORTHWEST COLLEGE
PHYSICS 2325: UNIVERSITY PHYSICS I
Spring 2016
Class Number 89364**

Time: 11:00 am – 1:00 pm, Tuesday and Thursday

Location: Spring Branch Campus, Room 205

Textbook: *Fundamentals of physics*, 10th edition, by Halliday, Resnick, and Walker

Instructor: Aaron Marks

Email: 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: Must have completed MATH 2413 or higher.

A calculus based physics course designed specifically for chemistry, physics, and engineering majors. Topics include principles of mechanics, rotation, sound and wave phenomena, kinetic theory, and fluid flow. Core Curriculum Course.

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 last class session) 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 bathroom 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 in the homework. Exam grades will be curved. No exam grade is ever dropped!

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 (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. 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:

Three Mid-Term Exams (18% each):	54%
Homework:	21%
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.

TITLE IX OF THE EDUCATION AMENDMENTS OF 1972, 20 U.S.C. A§ 1681 ET. SEQ.

Title IX of the Education Amendments of 1972 requires that institutions have policies and procedures that protect students’ rights with regard to sex/gender discrimination. Information regarding these rights are on the HCC website under Students-Anti-discrimination. Students who are pregnant and require accommodations should contact any of the ADA Counselors for assistance.

It is important that every student understands and conforms to respectful behavior while at HCC. Sexual misconduct is not condoned and will be addressed promptly. Know your rights and how to avoid these difficult situations.

Log in to: www.edurisksolutions.org . Sign in using your HCC student e-mail account, then go to the button at the top right that says **Login** and enter your student number.

Tentative Class Schedule:

This is a rough outline of the expected course content. Anything and everything is subject to change. A “Q” in front of a homework problem denotes the problem is in the “Questions” section at the end of each chapter, otherwise all problems come from the “Problems” section at the end of each chapter. Late homework is accepted but at half credit.

Date	Topic	Chapter	Homework
1/19	Introduction, Units	1	Hwk 1: due 1/28 Ch.1: 3, 12, 15, 21, 23, 41, 54
1/21	Position, Velocity, Acceleration	2	
1/26	Motion in 1D	2	Hwk 2: due 2/4 Ch.2: 1, 5, 11, 15, 25, 28, 44, 48, 49, 54a
1/28	Vectors	3	
2/2	Motion in 2D	4	Hwk 3: due 2/9 Ch.3: Q2, 3, 7, 13, 17, 22, 23, 27 Ch.4: Q5, Q17, 3, 16, 22, 28, 43, 90
2/4	Newton’s Laws	5	Hwk 4: due 2/11 Ch.5: Q3, 3, 7, 17, 29, 34, 45, 49, 57
2/9	Friction	6	
2/11	Circular Motion	6	Hwk 5: due 2/16 Ch.4: 56, 59 Ch.6: 6, 13, 16, 19, 25, 27, 42, 43, 51, 70
2/16	Review 1		
2/18	Exam 1	Ch. 1 – 6	

2/23	Work and Energy	7	
2/25	Conservation of Energy	8	Hwk 6: due 3/3 Ch.3: 41 Ch.7: Q3, 2, 8, 14, 18, 19, 27, 31, 35, 43, 55 Ch.8: Q5, 1, 3, 7, 18, 24, 31, 55, 86, 100
3/1	Momentum and Impulse	9	
3/3	Collisions	9	Hwk 7: due 3/10 Ch.9: Q3, 2, 19, 25, 26, 51, 54, 60, 74, 86, 101
3/8	Rotational Kinematics	10	
3/10	Rotational Dynamics	10	Hwk 8: due 3/22 Ch.10: 1, 4, 10, 11, 22, 25, 35, 38, 43, 51, 71, 81, 93
3/15	No Class		
3/17	No Class		
3/22	Review 2		
3/24	Exam 2	Ch. 7 – 10	
3/29	Rolling motion	11	
3/31	Angular Momentum	11	Hwk 9: due 4/7 Ch.11: Q5, 2, 9, 21, 24, 25, 28, 37, 38, 44, 51, 60
4/5	Static Equilibrium	12	
4/7	Gravitation	13	Hwk 10: due 4/14 Ch.12: Q7, 10, 17, 20, 23, 28, 64, 68 Ch.13: Q4, 3, 6, 17, 31, 36, 43, 53, 61, 63, 85
4/12	Fluids	14	Hwk 11: due 4/19 Ch.14: 3, 6, 10, 14, 28, 32, 35, 52, 59, 64, 77
4/14	Oscillatory Motion	15	Hwk 12: due 4/28 Ch.15: Q7, 6, 9, 17, 29, 30, 33, 47, 58, 115
4/19	Review 3		
4/21	Exam 3	Ch. 11 – 14	
4/26	Waves 1	16	
4/28	Waves 2	17	Hwk 13: due 5/3 Ch.16: 3, 10, 16, 17, 26, 74, 78, 81 Ch.17: 2, 12, 26, 29, 30, 36, 56, 57
5/3	Free day (review?)		
5/5	Final Review		
5/10	Final Exam	Ch. 1 –17	

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!!