I. Course: Physics 1321 - University Physics I

A. Catalog Description: First semester of a two-part calculus-based course covering mechanics of one- and two-dimensional motion, dynamics, energy, momentum, rotational dynamics and kinematics, statics, gravity, oscillations, waves and fluids. Primarily for science and engineering majors. Credit may not be applied toward degree for both PHYS 1321 and PHYS 1301.

B. Prerequisites: Credit for or concurrent enrollment in MATH 1432.

II. Course Objectives: The objective of this course is to learn the principles of mechanics through application of Newton's laws, understand the concept of energy and be able to apply these concepts to describe the motion of objects.

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

1. master the physical concepts of force and energy;
2. be able to apply these to obtain solutions to technical problems;
3. use this scientific foundation to continue studies in more advanced courses in science and engineering.

Other learning outcomes include:

1. Students completing this course will be able to convey knowledge of the principles of physics and be able to use these principles to solve problems.
2. Students will be able to take a real-life problem and use physical principles and mathematical tools to describe the problem.

III. Course Content: This course will cover chapters 1-16 which include the following
topical areas:

1. Vectors
2. Newtonian Mechanics: Motion in 1-D, 2-D and 3-D
3. Newton’s Laws: Force and Motion
4. Work and Energy
5. Momentum and Collisions
6. Systems of Particles
7. Circular Motion
8. Rotational of Rigid Bodies
9. Gravitation
10. Solids and Fluids
11. Oscillations
12. Waves and Sound

IV. Course Structure:

Computer and internet access are required for this course. For the current list of minimum technology requirements and resources, see http://www.uh.edu/online/tech/requirements. For additional information, contact the office of Online & Special Programs at UHOnline@uh.edu or 713-743-3327.

Blackboard, Mastering Physics, Microsoft Teams, and possibly other online resources will be required. See https://uh.edu/online/students/remote-learning/ for more information on remote learning tools.

V. Textbook:

University Physics with Modern Physics, 15th edition, by Young and Freedman/Sears and Zemansky. Text with access code to Mastering Physics and MyReadinessTest is available at the UH bookstore.

VI. Course Requirements

A. (OPTIONAL) Reading Assignments: Reading quizzes covering the material from the reading assignment, consisting of 2-3 questions/problems, will be assigned online for each chapter. The quizzes will be available at least 24 hours before they are due and they will be due by the beginning of the lecture time. There will be a time limit for taking the quiz and you will be allowed 2 attempts for each quiz. Solutions for the quizzes will be discussed during the lecture and will be posted on the class website.

B. Homework Assignments: (See Pearson Mastering Physics for HW assignments) 10 or more homework problems will be assigned at the beginning of each chapter and will be due approximately one week from that date.

C. Exams: There will be one diagnostic exam, three regular exams and a final exam for a total of five exams for the class.

The required diagnostic exam for this course will test your basic mathematical
skills in algebra, geometry, trigonometry, calculus and word problem solving. The exam consists of 20 multiple choice questions. The exam will be administered online by the CASA Testing Center June 1-12. You can log onto the CASA website http://casa.uh.edu to register for the test.

The diagnostic exam is worth 3% of your final grade for the course. If you score above 70%, you should be well prepared to pass the course; 51 - 70%, you should review algebra, trigonometry and pre-calculus; 50% and below, you should consider dropping the course or re-enrolling once you have improved your math and problem solving skills.

If you score below 70% on the diagnostic exam, you can take a math tutorial to increase your diagnostic exam score to 70% but no greater. You must complete all tutorial sub-tests as well as the final test with a score of 75% or greater.

OR

If you just wish to improve your math skills, you can complete a math tutorial which has been set up by the Department of Physics.

The math tutorial course is set up through My Readiness Test, an online math tutorial offered by the publisher of the textbook for the course. If you purchased a textbook from the UH Bookstore, you will receive a free access code to My ReadinessTest. If you did not purchase your textbook through the UH bookstore, you can purchase a code for My Readiness test for $15 through the publisher's website: http://www.myreadinessstest.com/support/mpt/contactus_stu.htm

See https://uh.edu/nsm/physics/undergraduate/intro-course-info/ for information on how to register and access the math tutorial through My Readiness Test.

Statistics: A study of 543 students enrolled in Phys 1301 at UH showed that of the students who scored below 65% on the diagnostic exam, 78% of those completing the math tutorial passed the course, while only 45% of those who did not complete the math tutorial passed the course. These statistics show that it may be your advantage to complete the math tutorial to increase your chances of passing the course.

The regular exams will be online with Mastering Physics. They will cover 3-5 chapters and will consist of 10-20 multiple choice questions.

The final exam will be comprehensive covering all chapters covered for the course. The format of the final exam will be similar to that of a regular exam (Mastering Physics). The final will be given during the University Departmental Exam scheduled time.

Instructor's policy on make-up exams can be added here.
D. **Teamwork Component:** A team work component will be evaluated in this course by one of the two methods below. (You must choose one of these or use some other form of teamwork.)
   - Concept tests will be administered. Students will discuss these questions in teams as a method of peer instruction.

   OR

   - Teams consisting will be assigned to create a study guide for each of the exams for the course. The study guides will be posted in Blackboard and students will be able to choose the study guide which is best for use to prepare for the exam. Each group will have to work together to determine what will be included on the study guide and the best format for presenting it to the students.

VII. **Evaluation and Grading** *(Percentages for Homework, Diag. Exam and Final Exam must remain as they are listed. You may distribute the 12% discretional percentage to regular exams and teamwork, but teamwork is not to exceed 8%)*

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Teamwork Component</td>
<td>5%</td>
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<tr>
<td></td>
<td>12%</td>
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<tr>
<td></td>
<td>(Discretional – may be used for Reading Quizzes, a few additional percent toward exam, up to instructor etc.)</td>
</tr>
<tr>
<td>Homework</td>
<td>10%</td>
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<tr>
<td>Diagnostic Exam</td>
<td>3%</td>
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<tr>
<td>Regular Exam I</td>
<td>15%</td>
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<tr>
<td>Regular Exam II</td>
<td>15%</td>
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<tr>
<td>Regular Exam III</td>
<td>15%</td>
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<tr>
<td>Final Exam (Day and time)</td>
<td>25%</td>
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**Policy on grades of I (Incomplete):** The temporary grade of I (incomplete) is a conditional and temporary grade given when students (a) are currently passing a course or (b) still have a reasonable chance of passing in the judgment of the instructor, but for non-academic reasons beyond their control have not completed a relatively small part of all requirements. Incompletes will be given only when documentation has been submitted to support the need to receive an incomplete, i.e., medical statements.

VIII. **Consultation**
Office hours and how to schedule an appointment.

IX. **Bibliography**
Fundamentals of Physics, Halliday, Resnick, and Walker;
The Feynman Lectures on Physics, R. Feynman, R.B. Leighton, and M. Sands
OpenStax Online Free Textbook - [https://openstax.org/subjects/science](https://openstax.org/subjects/science).

X. **Tutoring**
Students can take advantage of tutoring through the following:
LAUNCH - www.uh.edu/ussc/launch

At LAUNCH, students can:
- Take advantage of individual Peer Tutoring
- Attend a Success Workshop
- Set up an individual appointment with an Academic Counselor

Addendum: Whenever possible, and in accordance with 504/ADA guidelines, the University of Houston will attempt to provide reasonable academic accommodations to students who request and require them. Please call 713-743-5400 for more assistance.

Academic Honesty: It is each student’s responsibility to read and understand the Academic Honesty Policy found at http://catalog.uh.edu/content.php?catoid=34&navoid=12627

Religious Holy Days: Students whose religious beliefs prohibit class attendance or the completion of specific assignments on designated dates may obtain an excused absence. To do so, please make a written request for an excused absence and submit it to your instructor as soon as possible, to allow the instructor to make arrangements. For more information, see: http://catalog.uh.edu/content.php?catoid=34&navoid=12495

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. Also, there is no appointment necessary for the “Let's Talk” program, which is a drop-in consultation service at convenient locations and hours around campus. https://uh.edu/caps/outreach/lets-talk

Standard Disclaimer: This syllabus is subject to change at the discretion of the instructor.