Syllabus for General Physics I

PHYS 1307

Textbooks:

Primary textbook: Fundamentals of Physics Halliday, David, Robert Resnick, and Jearl Walker. 11th edition New York: John Wiley & Sons.

The WileyPlus learning system is the primary automated way in which you will access the course textbook and provide answers to homework problems. It is your responsibility to become familiar with this system. Failure to do so will create artificial roadblocks to your learning process.

The reason we utilize the WileyPlus system is that it is backed by a large team of people who can help you in the system when problems arise. If you have followed my advice and purchased the WileyPlus bundle that includes the full electronic textbook and the course learning system, you have the following at your fingertips:

1. The complete textbook for all semesters, including video demonstrations of concepts and examples of how to solve physics problems. In addition, you can print (either to paper or to a format like PDF) whole sections and chapters from the book and carry them around with your (e.g. in a folder or binder, or on a mobile device).

2. An extensive catalog of study problems to augment those assigned by me for homework and other learning exercises.

3. A built-in student help system for when you have any technical problems, allowing you to speak to a Wiley system expert if there are issues with account access, problems with written or video material, etc.

Please note that if your problem(s) are not easily resolved by the Wiley staff via their system help options, you should then report the problem to me and I will contact our institutional Wiley representative. They have supervisory authority and can solve even the most difficult problems with the system. Their whole job is to make our learning experience easier, but we must use them wisely and you must always seek help through the normal WileyPlus student help system first before coming to me.

Purchase of an online HW access code from Wiley 11-th edition is mandatory

You may chose any text book for purposes of study

Alternate textbook 1 (self learning, not for homework submission): Knight, Randall D. *Physics for Scientists & Engineers: A Strategic Approach with Modern Physics.* Boston, MA: Addison-Wesley.

Alternate textbook 2 (self learning, not for homework submission): Serway, Raymond A., and John W. Jewett, Jr. *Physics for Scientists and Engineers with Physics Now and InfoTrac.* New York: Brooks/Cole.

Course description

Introductory Mechanics is a calculus-based college-level physics course for pre- engineering, pre- med and would-be science majors. Pre-requisites are MATH 1337 or MATH 1340. Students finishing this course should have a strong conceptual understanding of physics and well-developed skills in performing and analyzing laboratory activities. This course utilizes guided inquiry and student-centered learning to foster the development of critical thinking skills.

Disability Accommodations

Students needing academic accommodations for a disability must first register with Disability Accommodations & Success Strategies (DASS). Students can call 214-768-1470 or visit http:// www.smu.edu/Provost/ ALEC/DASS to begin the process. Once registered, students should then schedule an appointment with the professor as early in the semester as possible, present a DASS Accommodation Letter, and make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement.

<u>Accommodations for an extended time test need to be made in advance for all tests through DASS</u>. If you chose to take the test in class with the rest of the students, your test will be collected at the same time as others.

You are urged to make extended time arrangements through DASS. Our class size makes it impossible to accommodate all students who need extra test time.

Religious Observance

Religiously observant students wishing to be absent on holidays that require missing class should

notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (See University Policy No. 1.9.)

Excused Absences for University Extracurricular Activities

Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (University Undergraduate Catalogue)

Student Learning Outcomes

This is a calculus based course which will include some basic integration, differentiation, and discussion of the use of differential equations. Students will learn about the following topics: space and time, kinematics, forces, energy and momentum, conservation laws, rotational motion, torques, simple harmonic motion, waves, fluids.

Students are expected to come to class having done the assigned reading ahead of the class period in which it will be used, so that class time can be utilized effectively by learning application methods of the new material and general problem solving skills.

Upon completing this course, students will:

1. Be able to analyze and explain the components of linear and rotational motion (displacement, velocity, acceleration) including graphs

2. Be able to apply different forces and calculate work done by various forces, including fundamental force of gravity and Newton's laws

3. Be able to classify different forms of energy and use the conservation of energy principle and work- energy theorem problems

4. Be able to define impulse, momentum and solve collision problems
5. Explain simple harmonic motion and waves including their properties.

6. Students will learn to apply Pascal's principle and use Archimedes' principle.

Teaching strategies

First 5 min of the class will be dedicated to a short q&a. 40 - 45 minutes will be devoted to lecture and demonstrations. Here, a concept will be presented to emphasize practical/real-life applications, stressing important definitions and limitations. The rest of the class will be devoted to solving set of problems and question-answer sessions, the students will be guided in a discussion (whole class or small group) to develop solutions to the problems. Weakly online homework and quizzes will be assigned.

COVID-19 safety strategies

If a student will chose to attend the class in person, he/she will have to

wear a face covering that will cover nose and mouth. Students will have

to maintain 6 ft distance from other students. Those that refuse to follow this policy will not be allowed to stay in the classroom and will be asked to leave.

Material to be covered in the course : Motion in 1D

1.5 weeks

Basic math, Fundamental Units, Measurements Vectors
Graphing, Representations, 1D Motion
1D Motion cont, Relative Motion

Motion in 2D

2 weeks

2D Motion, Uniform Circular Motion Rotational Motion
Inertial Frames, Mass, Force List
3D Motion examples
Exam 1 (Motion)

2.5 weeks

Force Fields, Newton's 3 Laws

Force

Free Body Diagrams, Force Applications Resistive & Centripetal Forces

Work Energy Theorem

2 weeks

Work, Energy, & Power
Exam 2 (Forces)
Kinetic Energy, Potential Energy
Conservation of Mechanical Energy Conservation of Total Energy,
Energy Diagrams

Rolling and Rotation

2 weeks

Impulse, Momentum and Angular Momentum Collisions,
Rockets
Exam 3 (Energy & Momentum)
Center of mass, Rotational Inertia
Torque, Rolling

Fluids

1 week

Relationship between hydrostatic pressure, force, and the surface
area over which that force acts.
Pascal's principle.
Archimedes' principle

SHO and Waves

2 weeks

Simple harmonic motion, Pendulums Wave Properties
Wave Interactions ,Sound waves

Final Exam (Cumulative)

Grading

Final Grade will be calculated as following:
"Final Grade" will be calculated as following: 2x20% Tests + 20% Homework + 20%Online Quizzes + 20% Final Exam Grade

Letter grade breakdown:

"A" : [93%-100%] ,

"A-" : [89%-92%] ,

"B+" : [83%-88%] ,

"B" : [78%-82%] ,

"B-" : [73%-77%] ,

"C+" : [69%-72%] ,

"C" : [64%-68%] ,

"C-" : [61%-63%] ,

"D" : [50%-60%] ,

"F" < 50%

There is no grade curving in this course

One lowest Test grade (excluding Final Exam) and one lowest online Quiz grade will be dropped.

Tests and Final Exam will not have extra credit problems. There is no makeup test or exam.

Students will take 3 tests and after lowest grade will be dropped, 2 equally weighted (25% each) tests grades will remain.

<u>Each test will last the length of the regular class.</u>

Final Exams: Please, refer to Academic calendar at http://smu.edu/ registrar/ academic_calendar.asp