



PHYS 2325: MECHANICS

Course Syllabus

COURSE TITLE/SECTION: PHYS2325.001 - Mechanics

TIME: Tues & Thurs 10:00-11:15 am LOCATION: SLC1.102

FACULTY: Dr. Bing Lv OFFICE HOURS: Tu&Th, before & after class

E-mail: blv@utdallas.edu Office: PHYS 1. 622 Phone: (972)-883-3806

TA: Christopher Parish; Ruskin Patel; Ian Timms; Ryan Shaw; Joe Burnett (TA Pool for whole Mechanics Classes)

TA Office Hours: In PHY 1.602, tutoring will be available M&W 12:30p-2:30p, and Tu/Thur/Fri from 1p-3p; In PHY 1.202, tutoring will be available M,Tu & W nights from 7p-9p. Total 16 hours per week!

I. Course: Physics 2325 - Mechanics

- A. Description:** 3 Credit Hours. Calculus based. Primarily for science and engineering majors. Two lectures per week. Basic physics including a study of space and time, kinematics, forces, energy and momentum, conservation laws, rotational motion, torques, harmonic oscillation, and waves. Two lectures per week.
- B. Course Pre-requisites, Co-requisites, and/or Other Restrictions:** Prerequisite: [MATH 2413](#) or [MATH 2417](#). Co-requisites: [MATH 2414](#) or [MATH 2419](#) and [PHYS 2125](#).

II. Course Objectives & Outcomes: 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:

- Add and subtract vector quantities, perform scalar and vector products, determine vector magnitudes and angles relative to a reference frame.
- Demonstrate how position, velocity, acceleration and time are related mathematically, particularly under conditions of constant acceleration.
- For 2D and 3D systems, apply position, velocity and acceleration as vector quantities, including situations of circular motion and relative velocity
- Understand Newton's three laws relating forces and motion
- Apply Newton's laws to predict motion for various geometries and for problems involving friction (Exam 1 line)
- Understand and use conservation of energy, work, kinetic energy, and power
- Convert potential energy to force and apply with energy conservation



- Interrelate momentum and impulse; understand conservation of momentum; apply momentum to collisions.
- Understand rotational motion, angular momentum, moments of inertia and how they relate to kinetic energy (Exam 2 line)
- Understand simple harmonic motion
- Understand properties of waves such as wave functions, dynamics, power and superposition

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, and Fluid Mechanics
10. Oscillations
11. Waves and Sound

IV. Course Structure:

This course uses Blackboard eLearning, <https://www.utdallas.edu/elearning/>. All the class slides, sample problems exercised in the class, formula sheet for the test will be posted through eLearning. You need your UTD NetID to log in the system.

This course uses the Pearson Mastering Physics online homework system, see below.

V. Textbooks:

1. (Official text, but see all notes below) **Sears and Zemansky's *University Physics with Modern Physics*, 14th edition, by Young and Freedman.** Bear in mind that you will need volume 2 for PHYS 2326. The 13th and 12th editions are also good. See additional notes below.
2. (Included with new texts) Mastering Physics Student Kit, which is access to <http://www.masteringphysics.com>. This can be purchased directly on the site for ~\$66, or it comes with new versions of the text.

Once upon a time, the bookstore also had a package with volume 1 and 2 loose leaf with access code to Mastering Physics for a discounted price. Don't know if this still exists.



The access kit with or without an e-book is available at www.pearsonmastering.com. See the course website for more options for purchasing the textbook.

Other texts at the same level are also OK but must be calculus based (e.g. Halliday and Resnick and others) If you are purchasing the Young and Freedman text for the first time, be certain it includes the student access kit in order to do on-line homework. If you already have the 13th edition or any other appropriate text, and are not already registered for on-line homework (Mastering Physics for 14th edition)), you will need to register at www.masteringphysics.com so that you can access the homework web site for this class.

Other Course Materials and Electronics:

Cell Phones: Please silence during class – MAY NOT BE USED DURING TESTS

Laptops: Please only use them for notes – MAY NOT BE USED DURING TESTS

Calculator: with trigonometry capabilities but no graphing capabilities & no text function. (\$10-\$20) Really, **no phones** during tests!

VI. Course Requirements

A. Learning Evaluation

In an effort to evaluate the effectiveness of our physics instruction, we are conducting two multiple choice tests to probe student performance at the beginning and end of this course. The tests will account for 2% of your final grade. You will receive the full 2% by simply taking the test—your grade will NOT depend on your performance for the test. You can earn up to a 1% bonus on your final grade if your posttest grade is above the average. There will be no credit given for taking only one quiz. Each test is a 50 minute, multiple choice exam.

A pretest will be available from 8 **from 8:30 on Monday Jan 9th to 4:00 pm on Monday Jan 23rd provided that the Test Center is open.** Students need to reserve a seat in the Testing Center for this quiz at www.utdallas.edu/studentssuccess/testingcenter. The Testing Center's operational hours are at <http://www.utdallas.edu/studentssuccess/testingcenter/>

A posttest will be available **from 8:30 on Monday April 17th to 4:00 pm on Friday April 28th provided that the Test Center is open.**

No pens or pencils are needed and no books, notes, calculators or communications devices are allowed. The quizzes must be taken in the Student Success Center in the basement of the McDermott Library Test Center at MC 1.304 and a specialized browser (the Respondus Lockdown Browser) must be used. (This browser is installed on the computers in the computer lab.) These quizzes are on eLearning sites called “[\(MERGED\) PHYS 1301 - PHYS 2325.all - S17](#)”. If you don’t have a link to this site then you can be enrolled if you go to the Test Center at MC 1.304 and give the proctor your course number, section number and your NetID (usually three letters and six numbers). Please don’t try to contact anyone through eLearning!



A quiz will finish 50 minutes after you click 'Begin Assessment' (but the test might not even take that long). You must complete the test in a single interval 50 minutes or less.

If you have enrolled in this class after the semester has begun, you will NOT automatically have access to the site for physics quizzes. You will need to send an e-mail to Darren Crone, eLearning Director, darren.crone@utdallas.edu. The email must contain the course number (**PHYS 2325.001**) and your NetID.

- B. **Homework Assignments:** (See **Pearson Mastering Physics** for HW assignments) 13 or more **homework** problems will be assigned at the beginning of each chapter and will be due approximately one week from that date. e. Homework counts for 13% of your final grade. No Late homework is accepted.

Homework is graded and assignments will be made on-line in Mastering Physics. In order to do the homework, you must have access to the internet. The basic instructions are as follows:

- Log on to www.masteringphysics.com
- Click on REGISTER using the ACCESS CODE in the student access kit that came with your text and follow on-screen instructions.
- The course ID is **LV76001**
- Once you are registered, you will have access to your assignment package for the particular section being covered in class. For your student ID use the first 3 letters of your first name + the first 3 letters of your last name. Make sure the name you give the website matches your name of record.

- C. **Exams:** Three regular exams will be held at Test Center. Students need to reserve a seat in the Testing Center for this quiz at www.utdallas.edu/studentsuccess/testingcenter. The Testing Center's operational hours are at <http://www.utdallas.edu/studentsuccess/testingcenter/> (see preliminary date from the calendar below. The exam date/period is subjected to change). The regular exams will cover 3-5 chapters and will consist of 18-20 multiple choice/free response questions/problems. Each regular exam will be worth 20 % of your final grade for a total of 60% for the three regular exams.

The final exam will be held in class during exam time period scheduled by University, and will be comprehensive covering all chapters covered for the course. This exam will be given during the University scheduled time.

Exams will be **CLOSED BOOK**. It is expected that a student will have a basic scientific calculator with trigonometry capabilities but no graphing capabilities & no text function. *During exams, all books, notes, computers, programmable calculators, communicating calculators, smart-phones or equivalents, cell phones, as well as backpacks, purses, etc. are to be placed at the sides or front of the room during an exam. A student must produce his/her valid student identification card or Texas Driver's License if requested in order to take any exam or quiz.*

There are no makeup exams for this course. The lowest regular exam score will be replaced by the final exam score if the final exam score is higher.



- D. **SI instruction:** Supplemental Instruction (SI) is offered for this course. SI sessions are free group study opportunities, scheduled two or three times per week. Sessions are facilitated by an SI Leader, who has recently taken the course and received a high final grade. Attendance is voluntary. For information about the days, times, and locations for SI sessions, refer to www.utdallas.edu/studentsuccess/leaders/si.html.

Tutoring: Tutoring is also available through the student success center, 3rd floor McDermott Library, MC 3.606. For info, see <http://www.utdallas.edu/studentsuccess/mathlab/index.html>. Typically some math tutors also tutor physics. You are encouraged to take advantage of the office hours to discuss quizzes, homework and exams.

- E. **Cell Phones:** Please silence during class

Laptops: Please silence and only use them for taking notes

VII. Evaluation and Grading

- 2% Learning Evaluation (2% + 1% bonus)
- 5% Class Attendance/Activities
- 13% Homework (weekly, due on Sunday midnight)
- 20% Regular Exam I (Week of Feb. 17th-Feb.22nd at Test Center)
- 20% Regular Exam II (Week of Mar. 7th-Mar. 11th at Test Center)
- 20% Regular Exam III (Week of April 10th-April 15rd at Test Center)
- 20% Final Exam (Scheduled by University, In Class Exam)

At the end of the semester each student will receive a numerical grade that reflects their weighted scores on exams, quizzes and homework. Unless otherwise announced, no other factors enter into this numerical grade. Because exams will typically contain bonus problems, it is possible for a student have a final numerical score of greater than 100%. Initial assignment of letter grades follows the usual break points (A = 90% and above, B = 75 to 89.9999%, C = 60 to 74.9999%, D = 50 to 59.9999%, F = less than 50%). While some flexibility may be applied in assigning break points, this should not be assumed.

Technical Support

If you experience any problems with your UTD account you may send an email to: assist@utdallas.edu or call the UTD Computer Helpdesk at 972-883-2911.

Calendar

Session	Contents	Chapters
1	Physical Quantities and Vectors	Intro./ 1
2	Physical Quantities /1D Motion	1
3	1D Motion	2
4	2 and 3D Motion	2
5	2 and 3D Motion	3
6	Newtons Laws of Motion	3
7	Newtons Laws/Applying Newton's Laws	4-5
8	Applying Newtons Laws	4-5
9	Applying Newtons Laws	4-5



10	Review for Test 1 (Chapter 1-4)	
11	Work and Kinetic Energy	6
12	Work and Kinetic Energy	6
13	Potential Energy and Energy Conversion	7
14	Potential Energy and Energy Conversion	7
15	Momentum, Impulse & Collisions	8
16	Momentum, Impulse & Collisions	8
17	Review for Test 2 (Chapter 5-8)	
18	Spring Break	
19	Rotation of Rigid Bodies	9
20	Rotation of Rigid Bodies	9
21	Dynamics of Rotational Motion	10
22	Rotational Motion/ Equilibrium	10
23	Gravitation	13
24	Periodic Motion	14
25	Periodic Motion	14
26	Review for Test 3 (Chapter 8, 9, 10, 14)	
27	Waves	15
28	Waves	15
29	Sounds	16
30	Final Exam Review	
31	Final Exam (Final Exam Period)	1-16

Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD printed publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Series 50000, Board of Regents, The University of Texas System*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391) and online at <http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html>

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.



Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic Dishonesty, any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Copyright Notice

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe the copyright owner's rights and such infringement is subject to appropriate disciplinary action as well as criminal penalties provided by federal law. Usage of such material is only appropriate when that usage constitutes "fair use" under the Copyright Act. As a UT Dallas student, you are required to follow the institution's copyright policy (Policy Memorandum 84-I.3-46). For more information about the fair use exemption, see <http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm>

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures



Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of **F**.

Student Accessibility

The goal of Student AccessAbility is to provide students with disabilities equal educational opportunities. Student AccessAbility provides students with a documented letter to present to the faculty members to verify that the student has a disability and needs accommodations. This letter should be presented to the instructor in each course at the beginning of the semester and accommodations needed should be discussed at that time. It is the student's responsibility to notify his or her professors of the need for accommodation. If accommodations are granted for testing accommodations, the student should remind the instructor five days before the exam of any testing accommodations that will be needed. Student AccessAbility is located in the Student Services Building, room 3.200. Phone: 972-883-2098. Fax: 972-883-6561; disabilityservice@utdallas.edu. Office hours are Monday – Thursday, 8:30 a.m. to 6:30 p.m., and Friday 8:30 a.m. to 5:00 p.m. Guidelines for documentation are located on the Student AccessAbility <http://www.utdallas.edu/studentaccess/documentation/>

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal



to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

These descriptions and timelines are subject to change at the discretion of the Professor.