



## *Course Syllabus – PHYS2325 Mechanics*

---

### Course Information and Modality

PHYS2325.0H2.23U, Mechanics, Summer 2023, Hybrid mode using online recorded lectures and in person/webcasted sessions. We will meet for the first time in person on Tuesday 5/25/2023 at 3:00pm in SCI 1.210 in order to get organized and I will go over the syllabus and explain the expectations. We will then use a flipped style of teaching using pre-recorded full lectures and problem-solving recitation sections all posted on eLearning followed by a mixture of live-online and in-person discussions and office hours for *questions & answers*. In this summer course, we will use innovative asynchronous and synchronous methods to offer a maximum flexibility to all students.

---

### Professor Contact Information

Dr. Mustapha Ishak-Boushaki, Professor of Physics and Astrophysics

Office: SCI 3.257K in the Department of Physics

Email: [mishak@utdallas.edu](mailto:mishak@utdallas.edu). Url and research web page: <http://www.utdallas.edu/~mishak/>

Office hours/discussion session: Tu 3:00-4:00PM and by appointment.

### Teaching Assistant Contact Information:

Sooriyaarachchi, Vinu: [vinu.sooriyaarachchi@utdallas.edu](mailto:vinu.sooriyaarachchi@utdallas.edu). Office hours/discussions session: Tu/Thu 3:00-4:00pm in SCI 1.210

*IMPORTANT: All students are strongly encouraged and expected to attend regularly in-person and online office hours set by the professor and TAs in order to ask questions about homework assignments, examples given in class/book and lectures.*

---

### Course Description

PHYS 2325 Mechanics (3 semester hours) Calculus based. Basic physics including a study of motion in 3 dimensions, kinematics, forces, energy, momentum, conservation laws, rotational motion kinematics and dynamics, torques, harmonic oscillations and waves. Course prerequisite: MATH2413 or MATH2417; course co-requisite: (MATH2414 or MATH2419) and (PHYS2121 or PHYS2125)

---



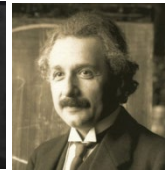
### Student Learning Objectives and Outcomes:

The students are expected to know and to be able to do by the end of this course the following:

- Addition, scalar multiplication, and vector multiplication of vectorial physical quantities such as forces.
- Understand the components of linear motion (displacement, velocity, acceleration) especially motion under conditions of constant acceleration
- Understand the different forces and work force problems
- Understand Newton's laws of motion and how to apply them to physical problems
- Understand the different types of energy
- Use the conservation of energy to solve problems
- Understand impulse, momentum and collisions, and how to use them to solve problems
- Understand center of mass and rigid bodies motion
- Understand rotational kinematics and dynamics and the relationship between linear and rotational motion
- Be able to solve problems using rotational and linear variables
- Understand and work with equilibrium situations including the different types of equilibrium.
- Understand simple harmonic motion and its applications
- Understand wave physics, properties, and some applications

Other broad learning outcomes:

- Students completing this course are expected to be able to convey knowledge of the principles of physics and be able to use these principles to solve problems in real life
- Students are also expected to develop the habit and approach of thinking before calculating in order to solve problems.



Complete recording watching by	Tentative Class Schedule		
	Contents	Chapter Y&F	Demos and/or videos
6/1/23	Introduction, Units, Physical Quantities	1	<a href="#">Physics is everywhere slides</a>
	Vectors	1	<a href="#">Interactive Vectors</a>
6/8/23	1D Motion, Displacement, Velocity, Acceleration	2	<a href="#">Free Fall Video</a>
	1D Motion, non-constant acceleration	2	<a href="#">Which is faster? Bowling Ball or Feather</a>
6/13/23	2D Motion and 3D motion	3	<a href="#">2-ball dropout</a>
	2D Motion and 3D motion	3	<a href="#">projectile simulator</a>
6/15/23	Forces and Newton's Laws	4	<a href="#">Air Pucks</a>
	Forces and Newton's Laws	4	<a href="#">Incline Board</a>
6/20/23	Application of Newton's Laws	5	<a href="#">Kinetic and Static Friction</a>
	Application of Newton's Laws	5	<a href="#">Terminal Velocity/Skydiving</a>
6/27/23	<b>Exam 1: 6/22/23 (Over chap 1-5)</b>	<b>tentative</b>	
6/29/23	Work and kinetic energy	6	<a href="#">rewinding a toy-car video</a>
	Work and kinetic energy	6	or demonstration
7/6/23	Potential energy and energy conservation	7	<a href="#">Multiple Curve Marble track</a>
	Potential energy and energy conservation	7	<a href="#">Giant pendulum</a>
7/13/23	Momentum, Impulse, and Collisions	8	air track & gliders <a href="#">Part 1</a> and
	Momentum, Impulse, and Collisions	8	<a href="#">Part 2</a> ; <a href="#">collision applets</a>
7/18/23	<b>Exam 2: 7/18/23 (Over chap 6-8)</b>	<b>tentative</b>	
7/25/23	Rotation motion kinematics and moment of inertia	9	<a href="#">Anti-Graviv Wheel</a> ; <a href="#">bicycle wheel</a> ;
	Rotation motion kinematics and moment of inertia	9	<a href="#">round objects race on incline</a>
7/27/23	Dynamics of rotational motion, torque, angular Momentum	10	Rotating Stool & Weights ( <a href="#">Part 1</a> & <a href="#">Part 2</a> )
	Dynamics of rotational motion, torque, angular Momentum	10	<a href="#">Rotating Stool &amp; Bicycle Wheel</a>
8/1/23	Simple Harmonic Motion and Periodic motion	14	<a href="#">Mass/Spring System</a> ;
	Simple Harmonic Motion and Periodic motion	14	<a href="#">pendulum</a>
8/3/23	Waves (part quantitative and part qualitative, see notes)	15	<a href="#">Tacoma bridge video</a>
	Waves (part quantitative and part qualitative, see notes)	15	<a href="#">standing waves on strings</a>
08/08/23	<b>Exam 3: 08/08/23 (Over Chap 9, 10, 14)</b>	<b>tentative</b>	



**Required Textbooks and Materials:** *University Physics*, by Young & Freedman (any edition from 12<sup>th</sup>, 13<sup>th</sup>, 14<sup>th</sup>, or 15<sup>th</sup> will work). Lecture slides and hand-written notes of problems solved in class will be made available on eLearning. You will need to purchase an access key for mastering physics homework and practice website at [www.pearsonmylab.com](http://www.pearsonmylab.com). This is associated with the course textbook. The key can be purchased directly on the site, or as a bundle with the textbook or eText. Explore your most economical option and keep in mind that you may need volume 2 or the whole book later for PHYS 2326.

---

### Assessments, Assignments & Academic Calendar

**Recitation session recordings:** Each student must review one of the two recitation sessions available on elearning to practice solving problems.

**Readings and recordings:** It is very important to read the lecture slides, the notes, and watch the recordings posted on eLearning by the dates indicated on the schedule so you do not fall behind. Look the schedule given above in order to find the corresponding chapters in the textbook to supplement with readings in the book and additional examples in the book (*University Physics*, Any edition, by Young & Freedman).

**Online Homework:** Assignments are given weekly for each chapter on the website <http://www.masteringphysics.com>. Student login information to this site is provided with the purchase of the key. Follow the instructions for students on the website ([www.pearsonmylab.com](http://www.pearsonmylab.com)) and use the course ID **ishak-boushaki40700**. **Important:** use your first name and last name *exactly* as they appear on the UTD class roster when you create your account on mastering physics website. All homework assignments will be graded online and no handwritten homework will be accepted. Homework must be done by the student and only the student. Any academic dishonesty on homework, quizzes, or exams will be reported to the Dean and prosecuted.

**In Classroom Exams:** 3 non-cumulative exams will be given in the classroom (see course schedule above for tentative dates that will be discussed in class).

---

**Grading Policy:** Online homework (30%). Late hw drops 20% per day. 3 exams in-person (24% each for a total of 72%). Yes, you can make up to a total of 102%. 2% of bonus given to accommodate for any late hw or any other inconvenience due to summer work or other unexpected problems.

**Grade scale:** This is for guidance and the cutting points between grades may slightly change as needed: A+: 97-100; A: 93-96; A-: 90-92; B+: 87-89; B: 83-86; B-: 80-82; C+: 77-79; C: 73-76; C-: 70-72; D+: 67-69; D: 63-66; D-: 60-62; F: below 60.



## Course & Instructor Policies

**Exams:** Students must have with them a valid picture ID to the exam. Scientific calculators that have trig functions will be allowed in the exam but graphing calculators and programmable calculators will not be allowed. Makeup exams will be offered only in the case of very good and documented medical reasons (or very exceptional and documented personal reasons.) All exams will be closed book and a formula sheet will be provided with the exam. Any student involved in cheating will be reported to the Dean and prosecuted.

**Cell phones:** Please do not have cell phones ring during class.

**Webcams:** Students are required to have a webcam for the discussion session, the recitation session and the three exams.

**Recordings and student code of conduct.** Lectures and sessions in this online course will be recorded. Any recordings will be available on eLearning to all students registered for this class as they are intended to supplement the classroom sessions. Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Recordings may not be published, reproduced, or shared, or uploaded to other online environments. This very important. Also, if the instructor or a UTD school/department/office plans any other uses for the recordings, consent of the students identifiable in the recordings is required prior to such use unless an exception is allowed by law. Failure to comply with these University requirements is a violation of the Student Code of 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 includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

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.

## 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.

### **Disability Services**

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m. The contact information for the Office of Disability Services is: The University of Texas at Dallas, SU 22 PO Box 830688, Richardson, Texas 75083-0688 (972) 883-2098 (voice or TTY)

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind.

Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance. It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

### **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.**