

Course Syllabus – PHYS 2325.003 – Fall 2024

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

Course Information

PHYS2325.003, Mechanics, Fall 2024, TR 1:00-2:15, Room SCI 1.210

Course Description

3 Credit Hours. Calculus based. Basic physics including a study of space and time, kinematics, forces, energy and momentum, conservation laws, rotational motion, torques, and harmonic oscillation. Two lectures per week.

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Prerequisite: MATH 2413 or MATH 2417

Corequisites: MATH 2414 or MATH 2419 and PHYS 2125

Professor Contact Information

Matthew Goeckner

Office: NSERL 3.408 (Note – this is a locked building.)

Email: goeckner@utdallas.edu

Phone: 4292

Website: www.utdallas.edu/~goeckner

Office hours: 10-4 M-Thurs or by appointment

TAs:

Name: Cody Allen

Email: Cody.Allen@UTDallas.edu

Location: TBD

Time: TBD

University supported Tutoring:

Through the student success center, 1st floor McDermott Library, MC 1.302.

Supplemental Instruction (SI):

Supplemental Instruction (SI) is offered for this course. SI sessions are free peer-facilitated study sessions, scheduled two times per week. Sessions are facilitated by an SI Leader, who has 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 <http://www.utdallas.edu/studentsuccess/help-with-courses/supplemental-instruction/>.

Required Textbooks and Materials

1. University Physics Volume 1, 15th edition, by Young & Freedman.* - ISBN 9780135206348
*Just about any physics text will work for mechanics. For example, the 14th–11th editions of Young & Freedman are also good.
2. Mastering Physics Student Kit, which is access to <http://www.masteringphysics.com>. This can be purchased directly on the site, or it comes with new versions of the text. **Course name MPGOECKNER2024 (Links via eLearning!)**
3. Recommended possible **supplemental** texts:
 - a. Schaum's Outline – College Physics ISBN-13: 978-0071754873 (~\$20)
(Note this is just for the example problems and the short discussions. It is **not** the calculus-based version – that one has issues.)
 - b. Schaum's Outline – 3,000 Solved Problems in Physics ISBN-13: 978-0071763462 (~\$20)
 - c. My class notes posted on eLearning. (free!)

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) **No phones during tests!**

Exams 3 and 4 will have a short list of provided equations. All others will not.

Homework assignments

- Will be given via MasteringPhysics – through eLearning (Blackboard). The homework problems are from “University Physics with Modern Physics, 15e”.
- **The course ID for this class is: MPGOECKNER2024 and it is directly linked via eLearning!**
- **If you do not have the money this moment to purchase access, you can still sign up and have access for a short period before you need to pay. (I think about 2 weeks.)**
- If for any reason you need technical help with MasteringPhysics call 1.877.672.6877 and explain the problem to Pearson's tech support.

- No handwritten homework will be accepted. The TA is paid to work 10 hours on this class and with 150 students, there is no way s/he can grade all of what you need to do to learn the subject.

Class notes

- **Students will be expected to turn in rewritten notes ONLINE (eLearning) each SUNDAY.**
- These notes can be in a variety of formats – but they should neat enough and contain enough information such that someone else can use them to learn the subject.
- **They should be similar in scope and length to the text in each of the chapters in the Schaum's outline. In fact, rewriting the chapters in Schaum's in your own words is a good way to do this.**
- They must ALSO HAVE YOUR NAME ON IT!

Typical order of weekly assignments:

Part 1: A largely reading portion in Mastering Physics of needed basic concepts due BEFORE we discuss the topic in class – typically 0.5 hours of work

Part 2: Rewritten notes – typically 1 hour of work. (Skim the homework in Part 3 first.)

Part 3: A portion of more traditional homework in Mastering Physics for AFTER we have discussed the topic in class, and you have written out your notes – typically 2 hours of work.

Part 4: TWO supplemental homework sets tied to Parts 1 and 3, for those who do not do well in Parts 1 & 3. **NOTE: THIS IS FOR EXTRA CREDIT POINTS!**

Exams

- All the exams are done in the **proctored testing center** (SP2) are online also using **Mastering Physics**. Each exam is open for approximately 1/2 week. (This was the time available in the testing center...)
- Makeup exams will only be offered in the case of documented reasons or exceptional personal circumstances. Make up exams will be distinct from normal exams.
- **No phones, laptops, graphing calculators or other note storage devices during tests!** Tests should take about 1 hour to complete. However, you will have up to 2 hours of time. (Non-graphing calculators are OK.)
- **Exams 3 and 4 will have a short list of provided equations. The first two will not.**

Dr. Goeckner - Fall 2024				
Exam Name (Total:4 exams)	Exam Dates	NOTES	1st DAY exam available for seat reservation	Last DAY exam available for seat reservation
Exam 1	9/26-10/1	TBD	NOW!	48 hours prior to exam time (Registration closed after 48-hour cut-off time)
Exam 2	10/18-10/22	TBD		
Exam 3	11/11-11/15	TBD		
Exam 4	12/7-12/13	TBD		

TESTING CENTER HOURS

<https://ets.utdallas.edu/testing-center>

Monday, August 19 – Tuesday, September 10

- o Monday: 8:30am – 5:30pm
- o Tuesday: 8:30am – 5:30pm
- o Wednesday: 1:00pm – 5:30pm
- o Thursday: 8:30am – 5:30pm
- o Friday: 8:30am – 5:30pm
- o Saturday: Closed August 24, 31, September 7
- o Sunday: Closed

Wednesday, September 11 – Friday, December 13

- o Monday: 8:30am – 9pm
- o Tuesday: 8:30am – 9pm
- o Wednesday: 3:00pm – 9pm
- o Thursday: 8:30am – 9pm
- o Friday: 8:30am – 9pm
- o Saturday: 9:00am – 1:00pm

o Sunday: Closed

EXTENDED HOURS

(FINAL EXAMS: Saturday, December 7 – Friday, December 13)

- o Wednesday, October 2: 8:30am – 9:00pm
- o Saturday, October 5: 9:00am – 5:00pm
- o Wednesday, October 9: 8:30am – 9:00pm
- o Wednesday, December 4: 8:30am-9pm
- o Saturday, December 7: 9:00am – 5:00pm
- o Wednesday, December 11: 8:30am – 9:00pm

CLOSURES

- o Monday, September 2: Labor Day
- o Monday, November 25 – Wednesday, November 27: Fall Break
- o Thursday, November 28 – Sunday, December 1: Thanksgiving Holidays
- o Friday, December 6: Reading Day
- o Saturday, December 14, 2024 – Sunday, December 22: Semester Intermittent
- o Monday, December 23, 2024 – Wednesday, January 1, 2025: Winter Break
- o Monday, January 20, 2025: MLK Day

Grading Policy

Learning Evaluation	(See “Learning Evaluation” below)	2% + up to a 1% bonus
Homework		28%
Rewritten class notes	(See “Notes” above)	10%
Midterm Exams (15% each)		45%
Final Exam		15%
Total		100%

Grade Scale:

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.

Approximate Course Calendar – SUBJECT TO CHANGE

Classwork				Homework		
Date	Topics	Chapter	In class Experiment	Homework due date	Homework	Est time (min)
20-Aug	Physical Quantities and Vectors	1	Different sized /mass balls and arrows	22-Aug	Introduction to MasteringPhysics	36
22-Aug	Physical Quantities and Vectors	1		25-Aug	Homework 1: Units, Physical Quantities, And Vectors	144
27-Aug	1D Motion	2	Feather/ball drop	26-Aug	Homework 2a: Concepts - Motion Along A Straight Line	33
29-Aug	1D Motion	2		1-Sep	Homework 2b: Motion Along A Straight Line	137
3-Sep	2 and 3D Motion	3	2-D Ball drop	2-Sep	Homework 3a: Concepts - 2 and 3D motion	23
5-Sep	2 and 3D Motion	3		8-Sep	Homework 3b: 2 and 3D motion	168
10-Sep	Newton’s Laws of Motion	4	TBD	9-Sep	Homework 4a: Concepts - Newton's Laws	25

12-Sep	Newton's Laws/Applying Newton's Laws	4 & 5	TBD	15-Sep	Homework 4b: Newton's Laws	151
17-Sep	Applying Newton's Laws	5		16-Sep	Homework 5a: Concepts - Applying Newton's Laws	9
19-Sep	Applying Newton's Laws	5		22-Sep	Homework 5b: Applying Newton's Laws	152
24-Sep	Review			Sept 26 - Oct 1	Exam 1 - 1-5	120
26-Sep	Work and Kinetic Energy	6		25-Sep	Homework 6a: Concepts - Work and kinetic energy	22
1-Oct	Work and Kinetic Energy	6		4-Oct	Homework 6b: Work and kinetic energy	148
3-Oct	Potential Energy and Energy Conversion	7	Bouncy ball vs splat ball, two carts on "frictionless" air track	2-Oct	Homework 7a: Concepts - Potential Energy & energy conservation	21
8-Oct	Potential Energy and Energy Conversion	7		13-Oct	Homework 7b: Potential Energy & energy conservation	150
10-Oct	Momentum, Impulse & Collisions	8	TBD	9-Oct	Homework 8a: Concepts - Momentum & collisions	55
15-Oct	Momentum, Impulse & Collisions	8		20-Oct	Homework 8b: Momentum & collisions	155
17-Oct	Review			Oct 18- 22	Exam 2 - 6-8	120
22-Oct	Rotation of Rigid Bodies	9	Wheel	21-Oct	Homework 9a: Concepts - Rotation of Rigid Bodies	30
24-Oct	Rotation of Rigid Bodies	9				
29-Oct	Rotation of Rigid Bodies	9		3-Nov	Homework 9b: Rotation of Rigid Bodies	182
31-Oct	Dynamics of Rotational Motion	10	Rotating Chair - water bucket	30-Oct	Homework 10a: Concepts - Rotational Motion	26
5-Nov	Dynamics of Rotational Motion	10				
7-Nov	Dynamics of Rotational Motion	10		10-Nov	Homework 10b: Rotational Motion	190
12-Nov	Review	14		Nov 11-15	Exam 3 - 9-10	120

14-Nov	Periodic Motion	14	Pendulums	13-Nov	Homework 11a: Concept - Periodic Motion	31
19-Nov	Periodic Motion	14		24-Nov	Homework 11b: Periodic Motion	154
21-Nov	Waves	15	Waves on strings	20-Nov	Homework 12a: Concepts - Waves, strings and sound	18
26-Nov	Thanksgiving/Fall Break	NO class				
28-Nov	Thanksgiving/Fall Break	NO class				
3-Dec	Waves	16		5-Dec	Homework 12b: Waves, strings and sound	134
5-Dec	Review				Exam 4 - All with focus on 14&16	
Dec 7-13	Final Exam Period			Final Exam Period	Exam 4 - All with focus on 14&16	120

All reading assignments specified in the schedule above should be completed before attending class. During class there will be interactive discussions on the reading material.

Student Learning Objectives/Outcomes

- 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

Learning Evaluation

In an effort to evaluate the effectiveness of our physics instruction, we conduct two multiple choice tests to probe student performance at the beginning and end of this course. The first test 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 first test. The second test grade will be based on performance, and you can earn up to a 1% bonus on your final grade.

Each test is a 50 minute, multiple choice exam.

- The first quiz (pretest) will be available from TBD to TBD provided that the Test Center is open. See schedule above. You will need to reserve a seat in the Testing Center for this quiz at:
 - <https://ets.utdallas.edu/testing-center>.

(Instructions for reserving a seat in the Testing Center have been posted on this site.) The Testing Center's operational hours are at <http://www.utdallas.edu/studentsuccess/testingcenter/>. Tests are unavailable when the Test Center is not open or when the Test Center is fully reserved.

- The second quiz (posttest) will be available from TBD to TBD provided that the Test Center is open. You need to reserve a seat in the Testing Center as for the post-test. Tests are unavailable when the Test Center is not open or when the Test Center is fully reserved.

You are asked to do two quizzes as part of your introductory physics course. The quizzes consist of multiple choice questions and are useful to the department in gathering information about the effectiveness of our courses.

No pens or pencils are needed. Books, notes, calculators and communications devices are NOT 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 “Two quizzes in PHYS class number”. (“Class number” will be replaced by your course & section number.) If you don’t have a link to this site then you can be enrolled if you go to the **Test Center at SP2** 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!

The 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.

Policies and Procedures for Students

The University of Texas at Dallas provides a number of policies and procedures designed to provide students with a safe and supportive learning environment. Brief summaries of the policies and procedures are provided for you at <http://go.utdallas.edu/syllabus-policies> and include information about technical support, field trip policies, off-campus activities, student conduct and discipline, academic integrity, copyright infringement, email use, withdrawal from class, student grievance procedures, incomplete grades, access to Disability Services, and religious holy days.