Course Syllabus – PHYS 2325.002 – Spring 2019

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

Course Information

PHYS2325.002, Mechanics, Spring 2019, TR 4:00-5:15, Room SLC 1.102

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 or 4293
Website: www.utdallas.edu/~goeckner
Office hours: 9-4 M-F or by appointment

TAs: (All TA office hours are open to all Phys 2325 students)

Angel Romero: Monday, 3-5p, PHY 1.602
Ashan Wettasinghe: Tues, 1-3p, PHY 1.602
Koustubh Bhattacharjee: Wed 3-5p, PHY 1.602 <= Will also work with this section
Stanislav Cherepanov: Thurs, 10a-noon, PHYS 1.606
Sauraj Jha: Friday, 10a-noon, PHYS 1.602

University supported Tutoring:

Through the student success center, 3rd floor McDermott Library, MC 3.606.

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, 14th edition, by Young & Freedman.*
   *Just about any physics text will work for mechanics. For example, the 13th–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.
3. Recommended **supplemental** texts:
   a. Schaum's Outline – College Physics ISBN-13: 978-0071754873 (~$15)
      (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!)
   d. Recorded lectures 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!**

Homework assignments

Will be given on the website http://www.masteringphysics.com. If signing up online, choose "University Physics with Modern Physics,14e". Login as a student following the directions. The course ID for this class is

MPGOECKNER2019 (This stands for: **M**astering **P**hysics **My name** and the **year**)

and 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. If for any reason you need technical help with MasteringPhysics call 1.877.672.6877 and explain the problem to tech support. **No handwritten homework will be accepted.**

Class notes

Students will be expected to turn in rewritten notes at the beginning of class each TUESDAY. 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.) 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 2.5 hours of work.

Part 4: – Two supplemental homework sets for those who do not do well in Parts 1 & 3.

Exams

All the exams are done in the **proctored testing center** are online also using **Mastering Physics**. Each exam is open for approximently one week including weekends. 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)

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

Spring 2019 Semester Hours:

Monday – Tuesday: 8:30am – 9pm
Wednesday: Closed (Opened Wednesday, 3/6/19 for Midterm, 5/8/19 for Finals)
Thursday – Friday: 8:30am – 9pm
Saturday: 9am – 1pm
Sunday: Closed
For extended hours during Finals week, please refer to Testing Center website

Dr. Goeckner - Spring 2019				
Exam Name (Total:4 exams)	**Exam Dates**	**NOTES**	**1st DAY exam available for seat reservation**	**Last DAY exam available for seat reservation**
Exam 1	2/18-2/23	Closed Wed 2/20	Mon, 1/14/19	72 hours prior to exam date (Registration **closed** after 72-hour cut-off time)
Exam 2	3/25-3/30	Closed Wed 3/27		
Exam 3	4/15-4/19 **(Sat closed!)**	Closed Wed 4/17		
Exam 4	5/3-5/11			

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)**
15-Jan	Physical Quantities and Vectors	1	Different sized /mass balls and arrows	**17-Jan**	**Introduction to MasteringPhysics**	**97**

17-Jan	Physical Quantities and Vectors	1		**20-Jan**	**Homework 1: Units, Physical Quantities, And Vectors**	**161**
22-Jan	1D Motion	2	Feather/ball drop	**21-Jan**	**Homework 2a: Concepts - Motion Along A Straight Line**	**33**
24-Jan	1D Motion	2		27-Jan	Homework 2b: Motion Along A Straight Line	137
29-Jan	2 and 3D Motion	3	2-D Ball drop	**28-Jan**	**Homework 3a: Concepts - 2 and 3D motion**	**23**
31-Jan	2 and 3D Motion	3		3-Feb	Homework 3b: 2 and 3D motion	168
5-Feb	Newton's Laws of Motion	4	TBD	**4-Feb**	**Homework 4a: Concepts - Newton's Laws**	**25**
7-Feb	Newton's Laws/Applying Newton's Laws	4 & 5	TBD	10-Feb	Homework 4b: Newton's Laws	151
12-Feb	Applying Newton's Laws	5		**11-Feb**	**Homework 5a: Concepts - Applying Newton's Laws**	**9**
14-Feb	Applying Newton's Laws	5		17-Feb	Homework 5b: Applying Newton's Laws	152
19-Feb	**Review**			**Feb 18-23**	**Exam 1: 1-5 SEE NOTE ABOVE**	**120**
21-Feb	Work and Kinetic Energy	6		**20-Feb**	**Homework 6a: Concepts - Work and kinetic energy**	**22**
26-Feb	Work and Kinetic Energy	6		3-Mar	Homework 6b: Work and kinetic energy	148
28-Feb	Potential Energy and Energy Conversion	7	Bouncy ball vs splat ball, two carts on "frictionless" air track	**27-Feb**	**Homework 7a: Concepts - Potential Energy & energy conservation**	**21**
5-Mar	Potential Energy and Energy Conversion	7		10-Mar	Homework 7b: Potential Energy & energy conservation	150
7-Mar	Momentum, Impulse & Collisions	8	TBD	**6-Mar**	**Homework 8a: Concepts - Momentum & collisions**	**55**
12-Mar	Momentum, Impulse & Collisions	8		17-Mar	Homework 8b: Momentum & collisions	155
14-Mar	**Review**			**Mar 25 - 30**	**Exam 2: 6-8 SEE NOTE ABOVE**	**120**
19-Mar	Spring Break	NO class				
21-Mar	Spring Break	NO class				

26-Mar	Rotation of Rigid Bodies	9	Wheel	**25-Mar**	**Homework 9a: Concepts - Rotation of Rigid Bodies**	**30**
28-Mar	Rotation of Rigid Bodies	9				
2-Apr	Rotation of Rigid Bodies	9		7-Apr	Homework 9b: Rotation of Rigid Bodies	182
4-Apr	Dynamics of Rotational Motion	10	Rotating Chair - water bucket	**3-Apr**	**Homework 10a: Concepts - Rotational Motion**	**26**
9-Apr	Dynamics of Rotational Motion	10				
11-Apr	Dynamics of Rotational Motion	10		14-Apr	Homework 10b: Rotational Motion	190
16-Apr	**Review**	14		**Apr 15-19**	**Exam 3: 9-10 SEE NOTE ABOVE**	**120**
18-Apr	Periodic Motion	14	Pendulums	**17-Apr**	**Homework 11a: Concept - Periodic Motion**	**31**
23-Apr	Periodic Motion	14		28-Apr	Homework 11b: Periodic Motion	154
25-Apr	Waves	15	Waves on strings	**24-Apr**	**Homework 12a: Concepts - Waves, strings and sound**	**18**
30-Apr	Waves	16		3-May	Homework 12b: Waves, strings and sound	134
2-May	**Review**				**Exam 4 - All with focus on 14&16**	
May 2-8	**Final Exam Period**			**May 3-11**	**Exam 4 - All with focus on 14&16 SEE NOTE ABOVE**	**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 8:30 on Monday Jan 9th to 4:00 pm on Monday Jan 23rd provided that the Test Center is open. The Test Center will be closed on Friday Jan 14th and Monday Jan 16th.You need to reserve a seat in the Testing Center for this quiz at http://www.utdallas.edu/studentsuccess/testingcenter/index.html. (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 8:30 on Monday April 17th to 4:00 pm on Friday April 28th provided that the Test Center is open. You need to reserve a seat in the Testing Center as for the pre-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 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!

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.