PHYS 1307 –0011 General Physics I (Mechanics) Summer I 2018

Course Overview

For life science majors. Covers vector kinematics, Newtonian mechanics, rotational motion, oscillations, waves, fluids, with examples from the life sciences. Pre or co- requisite: MATH 1337 (Calculus I). PHYS 1307 is an active-learning flipped classroom that implements teaching strategies developed from physics education research. Students can expect to prepare before class, participate in class discussions, and interact with the instructor via TopHat web-based polling software.

Instructor Biography

Prof. Dalley has been teaching physics courses at SMU from non-science majors to graduate students since 2006. Prof. Dalley has received both an Outstanding Professor Rotunda Award and the Provost's Teaching Recognition Award. At SMU he also directs science outreach programs and professional development courses for high-school physics teachers.

Benefits of taking this course

- Acquire UC tags and satisfy your major's requirements
- Retake to improve your grade
- Gain transferable skills in problem solving
- Take advantage of this term's small class sizes
- Take advantage of an active-learning style course

UC "tags" and Student Learning Outcomes

Together with PHYS 1105 lab course, satisfies a Level I Pure & Applied Science Pillar, or a Science and Engineering Breadth requiremnent (UC16), and a Quantitative Reasoning Proficiency & Experience.

Learning Outcomes

1) demonstrate basic facility with the methods of scientific inquiry and problem-solving
2) explain how the concepts and findings of physics shape our world
3) develop quantitative models as related to the course subject matter
4) apply symbolic systems of representation
5) formulate structured and logical arguments

Class Meeting: M-F 9:00 a.m. – 10:50 a.m.

Instructor: S. Dalley, Room 207 Fondren Science, sdalley@smu.edu
Office Hours: The hour before class

Text: **Fundamentals of Physics Extended** – Access - 10th Edition (Wiley), by David Halliday, Robert Resnick, Jearl Walker ISBN 9781118441497

Website http://www.physics.smu.edu/sdalley/1307Sum18/1307home.htm

GENERAL COURSE POLICIES

- The course webpage contains all information (the course does not use Canvas)

  http://www.physics.smu.edu/sdalley/1307Sum18/1307home.htm

- You will need any scientific calculator. Laptops/phones may not a substitute for this.
- You will need to use the student response system TopHat to answer questions in class with a wireless device with web access or text message capability.
- Communication via any method (phones, tablets, laptops, speech, gestures, writing, sharing, etc.) is not allowed within, from, or to the classroom during any graded in-class assessment. If you need to take or make an emergency call, please leave the room.
- This course operates a policy of zero tolerance toward **Academic Dishonesty** in any form in any graded assessment. It will usually result in an F grade for the course and a filing with the Dean of Student Life (Honor Code Violation).

GRADING POLICY

27 Pre-class Concept Surveys (multiple choice) **15%** of grade.
Lowest 2 Survey scores are dropped for any reason. Late surveys cannot be credited.

27 Post-class Practice Problem sets (numerical response) **20%** of grade.
Lowest 2 Problem set scores are dropped for any reason. Late submissions are credited at 50%.

4 in-class Quizzes (show working), each **10%** of grade

Final Exam (multiple choice): Problems **15%** of grade; Conceptual Questions **10%** of grade

Grade Boundaries

A > 90% > A - > 85% > B + > 80% > B >75% > B - >70% > C+ > 65% > C > 60% > D > 50% > F.

What you have scored on Concept Surveys, Practice Problems, Quizzes, and the Final is what determines your grade; not rounding up, effort, attendance, grades in other courses, scores of other students, scholarship requirements, my opinion, your opinion, your desired career path, the orbit of Venus, etc.

PHYS 1307 –0011 General Physics I (Mechanics) Summer I 2018

Date	Topic	Text Chapter	Objectives
Mo 6/4	**Measurement**	**1.1 - 1.3**	Understand and use dimensions, units, and significant figures
Tu 6/5	**Straight Line Motion I & II**	**2.1 - 2.4**	Understand and use distance, displacement, velocity, & acceleration in one dimension, including constant acceleration
We 6/6	**Straight Line Motion III / Co-op**	**2.5 - 2.6**	Interpret kinematics graphically and apply to free fall
Th 6/7	**Vectors, Motion in 2D & 3D**	**3.1 - 3.22** **4.1 - 4.4**	Understand vectors, scalar components, apply vector addition to kinematics in two and three dimensions
Fr 6/8	**Force & Motion I / Co-op**		Understand Newton's 3 laws, apply to gravity, tension & normal forces in one dimension.
Mo 6/11	**QUIZ CHAP 1-4 / Force & Motion II**	**5.1 - 5.3**	Understand Newton's 3 laws, apply to gravity, tension & normal forces in one or two dimensions and bodies.
Tu 6/12	**Force & Motion III & IV**	**6.1 - 6.3** **[4.5]**	Apply Newton's laws to resistive force & circular motion
We 6/13	**Energy & Work I / Co-op**	**7.1 - 7.3** **[3.3]**	Apply kinetic energy and work to constant forces
Th 6/14	**Energy & Work II / Conserved Energy I**	**7.4 - 7.6** **8.1 - 8.3**	Apply kinetic energy and work to non-constant forces and power; understand potential and conservtion of mechanical energy
Fr 6/15	**Conserved Energy I / Co-op**	**8.4 - 8.5**	Analyze systems subject to non-conservative forces;
Mo 6/18	***QUIZ CHAP 5-8 / Linear Momentum I***	**9.1 - 9.3**	Apply CoM and Newton's 2nd law to motion of systems in terms of linear momentum.
Tu 6/19	**Linear Momentum II / Oscillations I**	**9.4 - 9.8** **15.1 - 15.2**	Apply impulse and conservation of linear momentum to collisions; Apply mechanics to Simple Harmonic Motion
We 6/20	**Oscillations II / Co-op**	**15.5 - 15.6**	Understand concepts of damped and forced oscillations
Th 6/21	**Transverse Waves / Sound Waves I**	**16.1 - 16.3** **17.1 - 17.3**	Understand concepts of transverse wave displacement, speed, and energy; Understand concepts of sound wave displacement, speed, and interference
Fr 6/22	**Sound Waves II / Co-op**	**17.4 & 17.7**	Apply sound waves concepts to intensity and to frequency
Mo 6/25	***QUIZ CHAP 9 & 15-17*** **/ Fluids I**	**14.1 - 14.5**	Understand pressure effects of ideal fluids at rest
Tu 6/26	**Fluids II / Rotational Motion I**	**14.6 - 14.7** **10.1 - 10.3**	Apply equations of Bernoulli and Continuity to moving ideal fluids; Understand angular displacement, velocity, acceleration about a fixed axis
We 6/27	**Rotational Motion II / Co-op**	**10.4 - 10.7**	Extend and apply laws of mechanics to rotation (rotational inertia, torque)
Th 6/28	**Rotational Motion III / Equilibrium**	**11.4 - 11.8** **12.1 - 12.2**	Extend and apply laws of mechanics to angular momentum; apply mechanics to systems in equilibrium (balance)
Fr 6/29	***QUIZ CHAP 14 & 10 & 12 / Concepts Review***		
Mo 7/2	**FINAL EXAM : conceptual questions / Problems Review**		
Tu 7/3	**FINAL EXAM : quantitative problems**		

ASSESSMENT

PRE-CLASS CONCEPT SURVEYS

The classroom is flipped. You are required to spend time ***before*** class preparing for discussion of the topics as indicated on the syllabus. Consult relevant sections of the textbook and other learning aids to answer conceptual multiple-choice Surveys that are assigned in WileyPlus; one or two Surveys will be due each day. Surveys must be submitted by 8:45 am on the due date for credit – no exceptions!

Recommended Time Burden = 1 hour per Survey

POST-CLASS PRACTICE PROBLEMS

Practice for quantitative problem solving is assigned in WileyPlus after each class and due by the next class. One or two problem sets (2 problems each) will be due each day. Late submissions will receive 50% credit. If you are finding the homework problems initially too difficult, try some of the relevant problems in ORION to build your proficiency.

Recommended Time Burden = 1 hour per problem set

QUIZZES

There are four 1-hour problem-solving quizzes on the most recent material. Most of the credit in the quizzes is for clear working. You may use only the standard formula sheet provided and your own calculator. All data are provided in the questions.

EXAMS

The final exams are multiple choice; no credit is given for working. There is a 2-hour problem-solving exam. There is a one-hour conceptual question exam (questions are closely related to those done in class). You may use only the standard formula sheet provided and your own calculator. All data are provided in the questions.

ACCOMODATIONS

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.

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)