

GENERAL COURSE INFORMATION

(from the Collin College Generic Course Syllabus)

Course Number: PHYS-1401

Course Title: College Physics I

Course Description:

Lecture: Fundamental principles of physics, using algebra and trigonometry; the principles and applications of classical mechanics and thermodynamics, including harmonic motion, mechanical waves and sound, physical systems, Newton's Laws of Motion, and gravitation and other fundamental forces; with emphasis on problem solving.

Lab: Laboratory activities will reinforce fundamental principles of physics, using algebra and trigonometry; the principles and applications of classical mechanics and thermodynamics, including harmonic motion, mechanical waves and sound, physical systems, Newton's Laws of Motion, and gravitation and other fundamental forces; emphasis will be on problem solving.

Course Credit Hours: 4

Lecture Hours: 3

Lab Hours: 3

Prerequisite: MATH 1314, and either MATH 1316 or MATH 2412

Student Learning Outcomes: Upon successful completion of this course, students should be able to do the following:

Lecture:

1. Determine the components of linear motion (displacement, velocity, and acceleration), and especially motion under conditions of constant acceleration.
2. Apply Newton's laws to physical problems including gravity.
3. Solve problems using principles of energy.
4. Use principles of impulse and linear momentum to solve problems.
5. Solve problems in rotational kinematics and dynamics, including the determination of the location of the center of mass and center of rotation for rigid bodies in motion.
6. Solve problems involving rotational and linear motion.
7. Describe the components of a wave and relate those components to mechanical vibrations, sound, and decibel level.
8. Demonstrate an understanding of equilibrium, including the different types of equilibrium.
9. Discuss simple harmonic motion and its application to quantitative problems or qualitative questions.
10. Solve problems using the principles of heat and thermodynamics.
11. Solve basic fluid mechanics problems.

Lab

1. Demonstrate techniques to set up and perform experiments, collect data from those experiments, and formulate conclusions from an experiment.
2. Record experimental work completely and accurately in laboratory notebooks, and communicate experimental results clearly in written reports.
3. Determine the components of linear motion (displacement, velocity, and acceleration), and especially

motion under conditions of constant acceleration.

4. Apply Newton's laws to physical problems including gravity.
5. Solve problems using principles of energy.
6. Describe the components of a wave and relate those components to mechanical vibrations, sound, and decibel level.
7. Use principles of impulse and linear momentum to solve problems.
8. Solve problems in rotational kinematics and dynamics, including the determination of the location of the center of mass and center of rotation for rigid bodies in motion.
9. Solve problems involving rotational and linear motion.
10. Demonstrate an understanding of equilibrium, including the different types of equilibrium.
11. Discuss simple harmonic motion and its application to quantitative problems or qualitative questions.
12. Solve problems using the principles of heat and thermodynamics.
13. Solve basic fluid mechanics problems.

Additional Collin Outcomes:

1. Demonstrate knowledge of basic units of measurement and their relationships
2. Solve problems through equations involving the motion of bodies (Critical Thinking; Empirical/Quantitative)
3. Solve problems involving forces including frictional forces
4. Solve problems involving work and energy
5. Solve problems involving momentum and collisions
6. Explain the basic principles of fluid dynamics
7. Apply the principles of heat and thermodynamics
8. Explain and apply the principles of wave motion and sound
9. Demonstrate the collections, analysis, and reporting of data using the scientific method (Communication Skills; Teamwork)

Withdrawal Policy: See the current Collin Registration Guide for last day to withdraw.

Collin College Academic Policies: See the current Collin Student Handbook.

Americans with Disabilities Act Statement: Collin College will adhere to all applicable federal, state and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to contact the ACCESS office, SCC-D140 or 972.881.5898 (V/TTD: 972.881.5950) to arrange for appropriate accommodations. See the current Collin Student Handbook for additional information.

INSTRUCTOR PROVIDED COURSE INFORMATION

Instructor: Meade Brooks

Office Location: 213 Lawler Hall, Preston Ridge Campus

Office Hours: TBA

Office Phone Number: 972-377-1640 (do not leave voicemail, email me instead)

Email: Send ALL email to me through the course Canvas mail system, NOT my college email.

COURSE INFORMATION

Last Day to Withdraw from Course: TBA

Meeting Times/Location: This is a hybrid course. The lecture is online with an optional 1 hour weekly meeting on-campus. This 1 hour session will focus on application of the course concepts covered in the online lecture. Lab activities will be performed on-campus in the Physics Lab (LH TBA).

Technology Requirements: This course uses a variety of online technologies. For detailed information on the minimum technology requirements for this course and other related information, visit the eCollin Learning Center at: <http://www.collin.edu/academics/ecollin/index.html>

Minimum Student Skills: Students should have the attributes, skills and knowledge necessary for success in this online course including: self-motivation, good time-management skills, self-discipline, good reading comprehension, persistence, available time, ability to use a laptop, printer, software, and the Internet. Find out if you are ready to take an online course by completing the readiness assessment [SmarterMeasure](#). This is an important tool that helps determine your skills for taking an online course. From the SmarterMeasure assessment, you will discover information about your:

- Reading Speed and Comprehension
- Technical Competency and Knowledge
- Typing Speed and Accuracy
- Personal Attributes that relate to distance learning success

Netiquette Expectations: Sensitive discussion topics will be brought up in this class, so please think carefully before responding. Keep these guidelines in mind:

- Standards of courtesy and respect must be maintained at all times in our online “classroom.” Join in to the discussion, but remember that this is still a “classroom” setting and that respect and consideration are crucial for any intellectual discussion.
- Discussion areas are the place for intelligent and respectful airing of ideas. Name-calling and personal attacks are not permitted.
- Any violation of the standards of appropriate behavior online will be reported to the Dean of Students and appropriate disciplinary action will be taken by the college.
- A good rule of thumb is that you should never post a response online that you would not be willing to say in person. Once the course begins, please use your Canvas communication tools to contact Professor Brooks.

COURSE RESOURCES

Textbook: College Physics: A Strategic Approach, 4th Edition

Authors: Randall D. Knight, Brian Jones, Stuart Field

ISBN: 9780134724744

Several textbook purchase options are available for your consideration through the [Collin College bookstore](#). This online lecture makes use of several digital resources, and while available, a printed copy of the course textbook is not necessary. Pearson, the publisher, has made available a low-price digital textbook (etext) for this class packaged with MasteringPhysics, the online assignment system we will use for homework and exams.

The course textbook may be purchased from other vendors such as the Pearson store or Amazon. Due to a contract between Collin College and Barnes & Noble, I am not permitted to disclose those url's. But wherever you purchase your textbook (whether printed or etext), be sure your purchase includes MasteringPhysics! You will be unable to complete your chapter assignments or exams without access to MasteringPhysics. Upon start of class a MasteringPhysics course ID will be posted which is required to access homework assignments for this course.

Supplies: You should have a scientific calculator and computer with internet access.

COURSE COMPONENTS

Homework Problems: You will be given assignments by chapter in the MasteringPhysics online assignment system.

Discussions: Questions have been developed for a variety of course topics. Students must reply to each discussion question which are graded upon level of participation and thoughtfulness. Additionally, students must reply to at least 2 student postings on the topic.

Video Assignments: Involves watching the Mechanical Universe series and completing a worksheet for each video.

Team Sports Project: Students will work in groups of 5-6 students to research and analyze the physics involved in a variety of sports.

Exams: Three major tests will be given. These will be completed in the MasteringPhysics online assignment system. There is no final exam for this course.

Lab: Students will participate in laboratory activities on-campus. Students may register for any PHYS 1401 lab at the Preston Ridge Campus.

Method of Evaluation: Course averages will be calculated as follows:

MasteringPhysics HW	35%
Lab	25%
Exams (3)	15%
Video Assignments	10%
Team Sports Project	10%
Graded Discussions	5%
TOTAL	100%

Grades will be determined as follows:

90-100 = **A** 80-89 = **B** 70-79 = **C** 60-69 = **D** 0-59 = **F**

All class grades will be available through Canvas.

COURSE SCHEDULE

Week 1	Chapter 1 - Representing Motion
Week 2	Chapter 2 - Motion in One Dimension
Week 3	Chapter 3 - Vectors and Motion in Two Dimensions
Week 4	Chapter 4 - Forces and Newton's Laws of Motion
Week 5	Chapter 5 - Applying Newton's Laws
Week 6	Chapter 6 - Circular Motion, Orbits and Gravity Exam 1 , Chapters 1 – 6
Week 7	Chapter 7 - Rotational Motion
Week 8	Chapter 8 - Equilibrium and Elasticity
Week 9	Chapter 9 - Momentum
Week 10	Chapter 10 - Energy and Work
Week 11	Chapter 11 - Using Energy Exam 2 , Chapters 7 – 11
Week 12	Chapter 12 - Thermal Properties of Matter
Week 13	Chapter 13 - Fluids
Week 14	Chapter 14 - Oscillations
Week 15	Chapter 15 - Traveling Waves and Sound
Week 16	Chapter 16 - Superposition and Standing Waves Exam 3 , Chapters 12 – 16