



Division of Natural and Computational Sciences
Department of Biology
PHYS 1411 General Physics I

College Mission

College is a Historically Black College founded in 1894, by the Colored Methodist Episcopal Church, now the Christian Methodist Episcopal Church (CME). Our mission continues to embody the principles of the Christian Methodist Episcopal Church. The College shall prepare students with competencies in critical and creative thinking related to the knowledge, skills, and abilities as defined in areas of study. Additionally, the College shall provide an environment to inspire intellectual, spiritual, ethical, moral, and social development, which empowers graduates to engage in life-long learning, leadership, and service.

Textbook

College Physics, 5th Edition, By Alan Giambattista
ISBN10: 0073513954
ISBN13: 9780073513959 McGraw Hills Publishers.

Required Readings/Resources:

1. College Physics Reading Guides: 1st Semester
Created Nov. 21, 2019 by user OpenStax, Rice University
<https://www.oercommons.org/authoring/59807-college-physics-reading-guides-1st-semester/view>
2. Khan Academy – Physics
<https://www.khanacademy.org/science/physics>
An excellent suite of tutorial videos explaining a variety of Physics concepts. Great if in class use or for students trying to master the concepts.
3. Saylor Academy
Collection of PDF versions of textbooks on various topics. HTML versions are also available.
<https://learn.saylor.org/course/view.php?id=16> PHYS101: Introduction to Mechanics
4. Youtube 3Blue1Brown series. Vectors, Chapter 1, Essence of linear algebra
https://www.youtube.com/watch?v=fNk_zzaMoSs&list=PLZHQObOWTQDPD3MizzM2xVFitgF8hE_ab&index=1
5. Youtube 3Blue1Brown series, Linear combinations, span, and basis vectors, Chapter 2, Essence of linear algebra
https://www.youtube.com/watch?v=k7RM-ot2NWy&list=PLZHQObOWTQDPD3MizzM2xVFitgF8hE_ab&index=2

Other Requirements:

Access to the internet and computer capable to run office and other software

Course Description

GENERAL PHYSICS I course is designed to meet the requirements of all Science Major Students, including biology and mathematics majors. The course deals with fundamental concepts, principles, theories, and applications of kinematics, forces and energy, including thermodynamics.

Prerequisites: None

TEXAS COLLEGE OUTCOMES

1. Critical Thinking Skills
2. Communication Skills
3. Empirical and Quantitative Skills
4. Teamwork
5. Social Responsibility
6. Personal Responsibility

Furthermore, this course ensures the following institutional objectives:

1. Enhance communicative skills (oral and written)
2. Enhance critical thinking and technology skills.
3. Enhance leadership abilities and spiritual awareness.
4. Create opportunities for professional and pos-graduate pathways.

All learning objectives reflect the Texas College Core Values.

Academic Excellence: Developing a culture of curiosity and creativity that will challenge the frontiers of teaching/learning; stimulate research; raise the level of analytical reasoning and inquiry; and enable students to acquire leadership, human relations, communication, and technology skills.

Integrity: Instilling the pursuit of character, honesty, and sincerity of purpose as the moral rubrics upon which the behaviors of our graduates and College family are anchored.

Perseverance: Implanting diligence, enterprise, and pride in the application of skills, knowledge and abilities developed during the course of study at Texas College.

Social Responsibility: Promoting in the College community a conscious awareness that we are all stewards of the resources entrusted to our care.

Tolerance: Emphasizing openness to divergent points of view, applying an eclectic approach to rational and analytical thinking.

Community Service: Encouraging self-extension in service to others as the heart and soul of our educational enterprise.

STUDENT LEARNING OUTCOMES

When you have completed your study in this course, you should be proficient in meeting the following: objectives as described in the chart of weekly course schedule

Week	Topics	Activities and Due Dates	Course Objective
Week 1	Chapter 1 Introduction to college physics	Read textbook ch1 or use Learning objectives for ch1 downloaded from Handouts to see what topics are included in introduction. Learn about scientific notation, measurement	MSLO 1 and 5

		systems, physics problem solving and other topics using lecture ppt and related information found on the web. Watch YouTube video on vectors link to which is provided in bookmarks. Solve Ch1 Quiz problems and complete lab assignment on vectors.	
Week 2	Pretest Ch2 Force	Complete pretest composed of 4 theoretical questions and six problems. Read textbook ch2 or use Ch2 Learning objectives to see what topics are included in chapter about Forces and Quiz problems that need to be solved.	MSLO 1
Week 3	Ch2 Force (continued)	Solve all the Quiz problems. Complete lab assignment on 2. Brick Forces. The lab is designed to give the student an opportunity to develop intuition and computational skills related to the classic problem of the motion of a brick on a frictional inclined plane.	MSLO 1 and 5
Week 4	Ch3. Acceleration and Newton's Second Law of Motion	Study materials described in the learning objectives for ch3. Solve the problems provided in the quiz section of the learning objectives	MSLO 1 and 5
Week 5	Ch3. Acceleration and Newton's Second Law of Motion (continued) Test 1	Complete lab assignment related to the Acceleration and Newton's Second Law of Motion Test will include materials of chapters 1-3, four theoretical questions and six problems taken from lecture ppts and chapter quizzes	MSLO 1 and 5
Week 6	Ch4. Motion with a Changing Velocity	textbook ch4 and related Learning objectives 4, solve quiz problems attached to Learning objectives.	MSLO 1 and 5
Week 7	Motion with a Changing Velocity (continued) Ch5 Circular motion	Lab. Falling objects. This lab will allow students to measure velocities and accelerations for two objects falling with different air drag Textbook ch5 and related Ch5 Learning objectives, solve quiz problems attached to Learning objectives.	MSLO 2

Week 8	Circular motion (continued) Test 2 Midterm exam	Periodic motions. Student will study periodic motions using pendulum and will learn to describe periodic motions using amplitude, period and other parameters of these motions.	MSLO 2 and 5
Week 9	Ch6. Conservation of Energy	Textbook ch6 and related Ch6 Learning objectives. Solve quiz problems. Lab. Energy skate park. Potential Energy, Kinetic Energy and Frictional Energy Dissipation: Roller Coaster. The lab is designed to give students an entertaining way of examining the principle of Conservation of Energy. Build your roller coaster, let it go, and watch the interplay between potential and kinetic energy.	MSLO 4
Week 10	Ch7. Linear Momentum	Textbook ch7 and related Ch7 Learning objectives, solve quiz problems	MSLO 1 and 5
Week 11	Linear Momentum (continued) Test 3	Lab assignment on collisions in two dimensions	MSLO 1 and 5
Week 12	Ch11 Waves	Textbook ch11 and related Ch11 Learning objectives, solve quiz problems Waves. Students will learn to detect and describe waves using sound waves as an example. Lab assignment on waves on the string	MSLO 3 and 5
Week 13	Ch15 Thermodynamics	Textbook ch15 and related Ch15 Learning objectives, solve quiz problems. Thermodynamics lab. This activity is designed to familiarize students with the concepts of heat transfer, temperature, laws of thermodynamics. Students will conduct measurements in order to describe the thermodynamics phenomena.	MSLO 4
Week 14	Final exam		

Measurable Student Learning Outcomes (MSLO): By the end of this course, the candidate will be able to achieve increased familiarity with physical phenomena and gain a conceptual understanding of the fundamental principles that describe the world around us. In addition, develop the ability to apply these principles to the analysis of simple physical systems.

1. Interpret and analyze simple physical phenomena; be able to describe and explain motion, solve problems that require calculation of velocity, forces, acceleration.
2. Demonstrate an understanding of circular motion by solving problems and application of the formulas describing the circular motion in situations encountered in everyday experience;
3. Recognize and correctly use scientific and technical terminology related to the waves. Demonstrate understanding of wave related phenomena by solving the problems.
4. Demonstrate improved physical intuition and reasoning ability in using conservation of energy and thermodynamics principles in situations encountered in everyday experience.
5. Acquire the tools necessary for life-long learning in physical science.

Instructional Strategies:

- Inclass Discussion
- Inclass and Virtual Presentations
- Relevant videos

Student Activities:

- Participation
- Essay Questions
- Internet research
- Midterm and Final Exams
- Chapter Exams
- Laboratory Assignments

Method of Instruction:

- Web-based environment
- Class discussion to examine the topics on the course outline.
- Required readings and online activities.
- Use of online tools and resources to facilitate a deeper understanding of the readings and the class discussions.

Note: Designated time will be given to each student to discuss student progress. See your instructor for more information.

SOFTWARE AND SUPPLIES

Software and Programs:

1. Access to websites as referenced in class. *Students attempting to gain access through cell phones, Mac books, or outdated equipment may experience difficulties with certain websites or videos. It is the student's responsibility to locate a computer lab with viable equipment.*
2. Access to JICS. *It is the student's responsibility to become familiar with JICS.*

3. Documents in this course will be in MS Word format. PowerPoints and pdf files will also be used.

4. *Students should be prepared to back up files on their own Flash Drive. Work should be saved more than once, as it is not the instructor's responsibility if technology issues suddenly occur and information is lost.*

COURSE REQUIREMENTS

SUBMISSION OF ASSIGNMENTS

All assignments must be submitted on time **in JICS**. **Submitting assignments through email is discouraged**. If **extenuating circumstances** prevent you from turning in an assignment, please contact the Instructor **before** the due date. Late work will be accepted without penalties **only if emergencies are documented** or Texas College is experiencing difficulties. Students are required to have access to internet that is JICS compatible.

Students are expected to submit assignments on the due date. If you submit an assignment late, you will receive 70% of the earned grade for the assignment. No excuses will be accepted, including difficulties with technology.

ATTENDANCE POLICY

The student is responsible for attending all lectures, seminars, laboratories, and field work for each registered class. A student will be permitted one unexcused absence per credit hour of the course by the instructor in which he/she is enrolled. Any student whose unexcused absences exceed the number permitted by the instructor may be vulnerable to failing the course. The administration endorses student participation in activities and exercises that represent the college to the external publics. However, students are still responsible for the successful completion of coursework. Following are examples of excused absences and acceptable documentation considered by administration.

Excused Absences and the required documentation can be found on page 35 of the College Catalog. The Catalog can be found on the Texas College Website under the Office of Academic Affairs.

The student is responsible for attending all lectures, seminars, laboratories, and field work for each registered class—beginning with the first day of class scheduled—in order to verify registration with instructors and to complete all work assigned for the course. If a student does not attend class during the first week (first five instructional days) of the semester, or does not attend five consecutive class sessions, and does not give prior notification to the instructor of reasons for absence, and intent to attend the class, the student may be recommended to the Vice-President for Academic Affairs to be administratively withdrawn from the course. The instructor should read the rules governing class attendance and absences to each of the assigned classes at the beginning of each semester.

These attendance regulations will be strictly enforced.

The student will be held accountable for adhering to the College Attendance Policy. Instructors are not obligated to allow students to submit late assignments because of their absence unless the absences have been officially approved. An officially approved absence, however, gives the individual who missed the class an

opportunity to turn in the assignment late but in no way excuses the student from the work required. Official excuses are granted by the vice president for student affairs for authorized College activities, verified personal illness, or illness or death in the student's immediate family. Students should understand that absences may jeopardize their grades. A student will be permitted one unexcused absence per credit hour of the course in which he/she is enrolled. Any student whose unexcused absences exceed the number permitted may, at the discretion of the instructor, be assigned a grade of "F" or be dismissed from the class.

Absences will count from the first official date of classes and not from the first day the student attends. It is the responsibility of the instructor to keep an accurate attendance record of all students enrolled. Students receiving veterans' benefits are required to attend classes according to the regulations of the Veterans Administration in addition to those regulations set by the College for all students.

ACADEMIC HONESTY

Academic Integrity Policy:

Texas College believes that strength of character is as important as academic achievement, therefore, the College expects everyone in the academic community to maintain personal integrity in academic matters and not to contribute or condone the dishonesty of others. Scholastic dishonesty (which includes any form of plagiarism, cheating, falsification of records, and collusion with others to defraud) is improper and will not be tolerated. Texas College reserves the right to apply disciplinary actions to a student who has committed scholastic dishonesty. For further information, see the *Texas College Catalog found on the Texas College website (www.texascollege.edu) page 33, Item: Academic Integrity Policy.*

COVID-19 REQUIREMENTS

COVID -19 Vaccination Policy:

Texas College, as a private, faith-based institution, strongly suggests that, effective for the Fall, 2021 term, all students, faculty and staff provide evidence that they have been fully vaccinated. Individuals who have religious beliefs, medical reasons, and/or philosophies (or are generally indifferent to taking the vaccination) will be required to provide and/or sign a statement to that effect, which they believe prohibits them from being fully vaccinated. This information is available at <https://www.texascollege.edu/covid-19> information/ as well as <https://www.texascollege.edu/fall-2021>.

INSTRUCTIONAL METHOD

Texas College observes **remote synchronous instruction** defined as a two-way, real-time/live, virtual instruction between instructors and students when students are not on campus and observing COVID-19 distance requirements.

In this method, the required amount of instructional time related to courses will be scheduled each day, and communication is generated when attendance is recorded daily at a locally selected time utilizing school-purchased Software. Synchronous instruction is provided through a computer or other electronic device or over the phone. The instructional method will address the course and degree program requirements. If a student who is originally scheduled to receive instruction through the on-campus or synchronous instructional method is not present at the designated official course time, the student will be not be considered present for the day by engaging through the remote synchronous method.

In the remote synchronous instructional method, student engagement is measured daily, and attendance is assigned based on the student's completion of that day's course engagement measure. Students who do not complete the daily measure of engagement are to be counted absent for that day, and that absence cannot be changed to remote synchronous present if the student completes the engagement measure on a later date.

Attendance is measured as synchronous interaction for scheduled courses. Attendance depends on the **active participation of students whether virtual (synchronous) or in class (non-synchronous)**. Students are expected to attend online sessions just as students will do in a face-to-face means of instruction. Appropriate lighting is encouraged for better engagement when the video feature of Zoom is in use.

PROGRAM FOR WHICH THE COURSE IS REQUIRED

General Physics I is a requirement for Biology and Mathematics Majors which leads to a Bachelor of Science (BS) Degree in Biology or Mathematics.

METHOD OF STUDENT EVALUATION

Tests are typically composed of fill in the blank, short answer, and problems to be solved aimed at using critical thinking. Examinations are 100 points each.

Evaluation Components	% of Grade
Lecture	75
Classroom Assignments	
QEP Assignment 1 – Writing Assignment	
QEP Assignment 2 – Writing Assignment	
Chapter Examinations (test 1 and test 3)	
Midterm Examination	
Final Examination	
Laboratory	<u>25</u>
Total:	

QEP Assignment 1: consists of a five-paragraph essay. The first essay will be “Adding and subtracting forces represented by vectors. Find the resulting force graphically and calculate its magnitude.”

QEP Assignment 2: consists of a five-paragraph essay. The second essay will be “How to describe circular motion using position vector, displacement, velocity and acceleration vectors.”

QEP Assignments will be found under JICS Coursework.

Grading Rubric:

A = 90-100	Transformative (and submitted on time)
B = 80-89	Proficient
C = 70-79	Developing
D = 60-69	Beginning
Below 60	Not Submitted on time

***Grade of C or above is required to pass the course. The course must be repeated for Biology and Mathematics Majors if grade is a D or below.**

Course Assignments-Lecture and Laboratory: (Assignments and their Due Dates on Posted on JICS Coursework).

Each student is expected to complete the assignments as specified. There will be No exceptions.

ASSESSMENT

Performance based standards for each learning opportunity will be explained prior to each assignment. Students will work toward successful attainment of all standards. The assessment is designed to require use of high level thinking skills and to provide authentic opportunities for students to demonstrate an understanding of effective classroom management. Assessment of the course objectives may include but is not limited to methods such as simulation, debate, and research.

Quick-writes/Reflections: Each class will begin with a writing assignment related to your reading. At the end of each class, students will also write reflections based on what was learned.

Missed assignment cannot be made up. This is a measure of your attendance, and participation, as well as your thinking skills.

SPECIAL NEEDS LEARNING

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of the Vice President for Academic Affairs at (903) 593-8311 x. 2335 for accommodations as early as possible in the term.

DIVERSITY STATEMENT

Texas College is committed to creating a community that affirms and welcomes persons from diverse backgrounds and experiences and supports the realization of their human potential. We recognize that there are differences among groups of people and individuals based on ethnicity, race, socioeconomic status, gender, exceptionalities, language, religion, sexual orientation, and geographical area. All persons are encouraged to respect the individual differences of others.

Caveat:

In the event of extenuating circumstances, the schedule and requirements for this course may be modified.

TECHNOLOGICAL STATEMENT

This course is infused with technology in order to:

- Participate in Courses Synchronously
- To provide access for course information
- Use the Internet and electronic databases to conduct searches for research projects
- Create multimedia presentations to present class projects to teachers and peers
- PowerPoint Presentations

WRITING ACROSS THE CURRICULUM

Strong communication skills are critical for professionals. In an effort to maintain a commitment to developing effective writing skills for all students, all writing assignments will be evaluated for overall communicative competence. The following will be considered when grading written assignments:

- Word-processed (12 font), double-spaced, one inch left, right, top and bottom margins

- Content
- Clarity and Organization
- Source(s)
- Depth of thought/Originality
- Technology and Delivery
- Grammar and mechanics

RESOURCES

1. Teaching Thermodynamics Using a Vacuum Container for Food
Y Ogawara - The Physics Teacher, 2020 - aapt.scitation.org
2. [HTML] Student Opinion on Teaching Thermodynamics Through Synchronous and Asynchronous Distance Learning TG Wilson, AN Venturini, AD Christy - 2021 ASEE Virtual Annual Conference 2021 - peer.asee.org
3. Teaching and learning guide for: Dynamical systems theory in cognitive science and neuroscience LH Favela - Philosophy Compass, 2020 - Wiley Online Library
4. Transforming a Calculus for Life Sciences Course: Moving From Procedural Calculus to Studying Dynamical Systems and Bifurcation Theory. S Bennoun - PRIMUS, 2020 - Taylor & Francis
5. [BOOK] Linear Dynamical Systems. MD Grigoriu - 2021 - Springer
This book deals, first, with realistic systems. Simple dynamical systems become special cases of the general formulation. The inspiration for this book came from teaching a dynamics course online to Cornell University students during the 2020 Covid-19 pandemic

BIOLOGY PROFESSIONAL ORGANIZATIONS/ASSOCIATIONS

Professional Associations are a great source of information about internships, career pathways, conferences, scholarships, opportunities to meet people in your field, and a whole host of career-related topics. Usually associations will provide a discounted membership rate for students enrolled in college. A few of these organizations include:

- [American Academy of Forensic Sciences](#)
- [American Association for the Advancement of Science](#)
- [American Institute of Biological Sciences](#)
- [The American Physiological Society](#)
- [American Society for Biochemistry and Molecular Biology](#)
- [American Society of Crime Laboratory Directors](#)
- [American Society for Human Genetics](#)
- [American Society for Microbiology](#)
- [Association for Women in Science](#)
- [The International Association for Science, Technology and Society](#)
- [National Academy of Science](#)

https://www.purdue.edu/science/careers/build_professional_profile/professional_orgs/bio_orgs.html

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(Restated October 26, 2023)