

Abilene Approval Chart for Curriculum Changes

A = Approve I = Information Item R = Respond in Writing

Course Number PHYS 110 General Physics I or Degree Plan(s) _____

State the requested change and reason. A memo may be attached if more space is necessary.

We would like to add PHYS 110 General Physics I to the menu for the Life and Physical Sciences in the University Requirements. Explanation and justification is provided in the attached application.

Indicate the requested change.

	Change to a Course	Dept./School ¹	College	Dean	TEC	UGEC	AUAC/Grad	Provost	President
1.	Title (description unchanged)	A	A	A	I	-	I	I	I
2.	Description (not affecting content)	A	A	A	I	-	I	I	I
3.	Course term(s)	A	I	A	I	-	I	I	I
4.	Content (change of course outcomes)	A	A	A	I	-	I	A	I
5.	Number of hours (lecture, lab, contact)	A	A	A	A	-	A	A	I
6.	Course number within the hundred	A	A	I	I	-	I	I	I
7.	Course number beyond the hundred	A	A	A	A	-	A	A	I
8.	Prerequisites	A	A	A	I	-	I	I	I
9.	Course fee(s)	A	-	A	-	-	-	A	I
10.	From U to G or G to U	A	A	A	A	-	A	A	I
11.	Cross-list course	A	A	A	A	-	A	A	I
12.	Department of record	A	A	A	A	-	A	A	I
13.	Close a course	A	A	A	A	-	A	A	I
14.	New course (includes combining or splitting courses)	A	A	A	A	-	A	A	I

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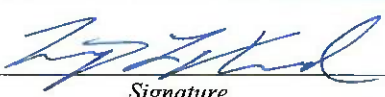
	Change to the University Requirements (All Campuses)	Dept./School ¹	College	Dean	TEC	UGEC	ADAC/Grad	Provost	Faculty	President	Trustees
1.	University Requirements — Change course outcomes of an included course ²	A	A	A	—	A	—	A	—	A	—
2.	University Requirements — Add or drop a required course from the University Requirements ²	A	A	A	—	A	—	A	A	A	—
3.	University Requirements — Add or drop a course from a menu within the University Requirements ²	A	—	—	—	A	—	A	—	A	—
4.	University Requirements — Change hours within a menu in the University Requirements ²	A	A	A	—	A	—	A	A	A	—
	Change to Catalog Information (for Campus)										
1.	General Requirements for Bachelor's Degrees and Associate's Degrees	—	—	—	—	—	A	A	A	A	—
2.	Policies governing academic probation and suspension	—	—	—	—	—	A	A	A	A	—
3.	Requirements for graduating with honors	—	—	—	—	—	A	A	A	A	—
	Change to a Degree Plan Proposed by Faculty or College										
5.	Educational Program — Revise ³	A	A	A	A	—	A	A	—	A	—
6.	Educational Program — Adopt/change admission requirements	A	A	A	A	—	A	A	—	A	—
7.	Educational Program — Add ³	A	A	A	A	—	A	A	A	A	I
8.	Educational Program — Discontinue	A	A	A	A	—	A	A	A	A	I
9.	GPA — Revise program-required GPAs	A	A	A	A	—	A	A	—	A	—
10.	Minor — Revise	A	A	A	I	—	I	I	—	I	—
11.	Minor — Add	A	A	A	A	—	A	A	—	A	—
12.	Minor — Discontinue	A	A	A	A	—	A	A	—	A	—
13.	Degree — Add	A	A	A	A	—	A	A	A	A	I
14.	Degree — Discontinue	A	A	A	A	—	A	A	A	A	I
	Change to a Degree Plan Proposed By Provost										
15.	Educational Program — Discontinue	R	—	R	A	—	A	A	A	A	I
16.	Minor — Discontinue	R	—	R	A	—	A	A	—	A	—
17.	Degree — Discontinue	R	—	R	A	—	A	A	A	A	I

¹ When an academic unit does not have a council, the UGEC and/or UUAC will serve as its academic council, depending on the nature of the issue.

² Courses that satisfy ACU's University Requirements will normally have lower-level numbering, be free of prerequisites and co-requisites, appeal to more than one or two majors, and "not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession" (SACS 2.7.3). Departments may request exceptions to the first three criteria.

³ For undergraduate majors, a minimum of 30 hours is required. These programs must have a minimum of 6 elective hours, unless the requirements of external accrediting bodies make it impossible.

Revised 8-29-22

Department/School Chair(s)	
 Signature	9/14/22 Approval date
_____ Signature	_____ Approval date

College Academic Council(s)	
_____ Signature	_____ Approval date
_____ Signature	_____ Approval date

Dean(s)	
_____ Signature	_____ Approval date
_____ Signature	_____ Approval date

Teacher Education Council	
_____ Chair's signature	_____ Approval date

University General Education Council	
_____ Chair's signature	_____ Approval date

Abilene Undergraduate Academic Council	
_____ Chair's signature	_____ Approval date

Graduate Council	
_____ Chair's signature	_____ Approval date

Provost	
_____ Signature	_____ Approval date

Faculty	
_____ Chair of Faculty Senate	_____ Approval date

President	
_____ Signature	_____ Approval date

Application for Life and Physical Sciences Menu

Guidelines For All General Education Courses

1. All general education courses must be 100-level or above.
2. General education courses should present a breadth of knowledge, not focusing on skills, techniques, and procedures specific to a particular occupation or profession.
3. Individual courses will fulfill only a single general education requirement.
4. Courses free of prerequisites are preferred. Applications to add courses with prerequisites must provide additional evidence that the course contributes to a student's breadth of knowledge and is not specific to a particular occupation or profession.
5. Each course may appear on a maximum of two menus that accept applications (arts and humanities, cultural literacy, life and physical sciences, and social and behavioral sciences).

Life and Physical Sciences Description

Courses within this domain use the methods and models of the natural sciences to describe, explain, and predict phenomena in the physical world; they employ empirical evidence, scientific principles, and interactions among natural phenomena to understand the world around us.

Instructions

Complete this form and submit it with a course syllabus and approval chart to the University General Education Council. Faculty submitting an application should be prepared to perform annual assessment for their course. The assessment will be conducted with the rubric included in this course application.

Subject code, course number, and title of course:	PHYS 110, General Physics I
Terms offered:	Fall, Summer
Catalog description:	Principles of mechanics, heat, and sound. An algebra-based physics course, designed primarily for liberal arts and pre-medical and pre-dental students.
Course prerequisites:	MATH 109 or MATW 109, MATH 124, or MATH 185
Cross-listed courses: *Note: Many gen ed courses are cross-listed between the Abilene and Dallas campuses.	
Other general education menus on which the course appears or you are applying for:	

Prerequisites

The council understands that many of the courses on this menu will have corequisites and that the second course in a sequence may also have a prerequisite.

1. Is the course a lower-division (100- to 200-level) course in astronomy, biology, chemistry, physics, agricultural science, environmental science, or geology?
☒ Yes ☐ No

If yes, continue to 2. If no, please explain how this course meets the description of life or physical sciences above. Applications for courses originating in other disciplines will be considered.

2. Does the course have more than one prerequisite and/or more than one corequisite?
☐ Yes ☒ No

If no, continue to 3. If yes, please explain why an exception should be made to include this course in the Life and Physical Sciences menu.

3. If the course has prerequisites, provide evidence that the course contributes to a student's breadth of knowledge. Also provide evidence that the course content is not specific to a particular occupation or profession (200 words or less).

This course covers the basic physics of mechanics, i.e. how objects move and the forces needed to make that motion happen. This material can be useful to anyone wanting a deeper understanding of moving objects and forces. This will allow them to make calculations using equations to describe situations in detail rather than in inexact ways. The only prerequisite for this course ensures students have the math skills needed to use these equations.

Relevant Outcomes

- C2: Analyze quantitative data, published writing, or observable phenomena to draw informed conclusions.
- C3: Interpret mathematical and/or logical models such as formulas, graphs, tables and schematics, and draw inferences from them; and
- C4: Integrate new data into their existing knowledge.

Describe how the course meets the C2 outcome (100 words or less).

This course focuses on learning how to describe the motion of objects in the world around us by applying the principles of forces, energy, and conservation of momentum and energy. This allows students to describe quantitatively how objects move.

Describe how the course meets the C3 outcome (100 words or less).

Students learn Newton's laws of motion and the conservation laws that govern the motion of objects. So they will learn how to describe the motion of objects using these equations, how to visualize and interpret this motion using graphs, and how to apply the concepts of conservation of energy and momentum to understand this motion.

Describe how the course meets the C4 outcome (100 words or less).

Students learn many new concepts and models used to describe the motion of objects. These include: inertia, Newton's laws, conservation of momentum and energy, forces, rotational inertia, etc.

Outcomes assessment should occur within one or two exams/assignments. Please indicate which exams or assignments will be used for each outcome. Provide assignment prompts if available.

Area to Be Assessed	Assessment Artifact
Outcome C2	Questions from exams
Outcome C3	Force Concept Inventory
Outcome C4	Force Concept Inventory

Outcome C2 will be based on specific questions from a few exams. The exact questions will change from year to year but the tested concept will be the same each time. These concepts will be: Conservation of Momentum (Exam 4), Conservation of Energy (Exam 3), and vectors (Exam 1). The vectors assessment will also appear as a post test in PHYS 112.

The Force Concept Inventory (FCI) is a published assessment for evaluating the conceptual understanding of forces and object motion. It is a well known standard in Physics Education Research. We are asked to protect the integrity of this assessment so I will not attach it but can provide it if needed. This is administered using a pre and post test methodology during the course. Outcome C3 will be based on a subset of the FCI questions which involve students evaluating graphs or diagrams or using formulas. Outcome C4 will be based on the normalized gain in FCI score as this change reports how well they have added the course material to their knowledge base.

Please use the following rubric to perform assessment each year.

Student Learning Outcome C2

Students will be able to:	Shortcomings	Meets Expectations	Points of Excellence
Analyze data to draw conclusions	Lacks sufficient analysis of data or published writing.	Analyzes data and/or published writing in an effective manner.	Analyzes data and/or published writing in an exemplary manner.

Students earning less than 60% of the points will be placed in the “Shortcomings” category, those between 60% and 90% will be in the “Meets Expectations” category, and those with 90% or higher will be in the “Points of Excellence” category.

Student Learning Outcome C3

Students will be able to:	Shortcomings	Meets Expectations	Points of Excellence
Interpret mathematical and/or logical models such as formulas.	Little to no demonstrated ability to interpret relationships and/or data in models.	Demonstrates ability to interpret relationships and/or data in models.	Exceptional ability to interpret relationships and/or data in models.

Students answering less than 60% of the questions correctly will be placed in the “Shortcomings” category, those between 60% and 90% will be in the “Meets Expectations” category, and those with 90% or higher will be in the “Points of Excellence” category.

Student Learning Outcome C4

Students will be able to:	Shortcomings	Meets Expectations	Points of Excellence
Integrate new data into their existing knowledge	Shows little to no grasp of new information and/or does not demonstrate adequate connection to previous learning.	Grasps new information and makes connections to previous learning.	Exceptional grasp of new information and/or demonstrates outstanding ability to connect to previous learning.

Students with normalized gains below 0.2 will be in the “Shortcomings” category, those between .2 and .6 will be in the “Meets Expectations” category, and those above 0.6 will be in the “Points of Excellence” category.

Abilene Christian University

Course Policy Statement and Syllabus

PHYS 110.01 - General Physics I

Onstead Science Center (OSC), Room 331

1:00 PM - 1:50 PM (MWF)

Fall 2022

Instructor Information

Instructor: A. Ryan Kutayah, Ph.D., Assistant Professor

Office: OSC 117C

Email: ryan.kutayah@acu.edu

Phone: (325) 674-2166 (office – call only). (cell– (347) 869-5542– text or call, please limit texts and calls to urgent situations only)

Free Help Sessions (Office Hours): MWF 8:30 - 10:30 AM, Th 3:30 - 4:30 PM; or by appointment

Required Textbook and Software

Textbook: *Physics*, 11th edition, Cutnell and Johnson, Wiley 2018

Software: *WileyPLUS Next Gen*; software access is provided with the text or can be purchased separately.

Catalogue Description

This course is a study of mechanics, heat and sound. Concurrent enrollment in PHYS 111 is highly recommended. Prerequisite: MATH 109, 124 or 185. Credit hours: 3

Intended Audience

This course is the first semester of a two-semester algebra-based physics course that is primarily designed for liberal arts, pre-medical and pre-dental students.

Attendance

Students should be in class each time that it is scheduled. Consistent attendance and preparation before class time represents a minimum level of commitment that is required of university students. As a matter of courtesy to the instructor and other students, each student is expected to be punctual to all class meetings. Students are expected to participate in daily student-centered active learning sessions which requires attendance. Absences will adversely impact participation and quiz grades (40% of overall grade comes from participation and quizzes).

Schedule

A tentative class schedule may be found at the end of this document. The instructor reserves the right to make changes to the schedule as needed. In the event of a change in the schedule, the students will be notified either in-person during lecture time, via email or Canvas announcement.

Homework

This class will work in the flipped framework. Therefore completion of pre-lecture material like chapter readings, videos, and problem sets are critical for success. Homework will encompass one or more of the aforementioned pre-lecture material. Homework assignments will be administered through Canvas. Students should ensure that Canvas notifications are turned on so that they may be alerted when an assignment or announcement is posted. The *WileyPLUS* software package is required to access and complete the homework assignments (especially the problem sets and pre-lecture videos). No late homework will be accepted. Students are encouraged to allocate time in advance of the due date to start on the homework, and to visit with the instructor when difficulties are encountered with particular problems. Working together on problems is also encouraged, but all solutions presented for credit must be defensible by the student submitting them for credit. When working in groups each person should contribute an equal share of the assignment.

Examinations

Five examinations are scheduled for this class, dates and times for the exams are shown on the tentative class schedule. All students are expected to take each exam at the scheduled times. Stand-alone electronic calculators may be used for examinations and all necessary formulas will be provided. The exams will be administered through the Respondus LockDown Browser. Exams must be completed and submitted in the class room failure to do so will result in a zero for that exam. Exceptions to in-class submission of exams are possible under certain circumstances, what qualifies as an exceptional case and the method of submission is at the discretion of the instructor. **Student athletes** with excused absences on exam dates must coordinate a make-up exam date with the instructor no later than **one week before the exam**; you may compare your event schedule to the instructor's office hours to determine a suitable time (please send an email to the instructor with suitable dates).

Grades

Grades are calculated and will be available to students at normal university scheduled times. Grades are based on the categories given below where each category represents an average, for example, **Participation** represents the average of the student's total participation grade and it accounts for 30% of the student's final grade. The final grade is calculated as the sum of the percentages earned for each category.

Participation	_____	30%
Homework	_____	40%
Quizzes	_____	10%
Exams	_____	20%

Final grades are calculated by taking the respective weights (see table above) of the average homework grade and average exam grade and adding them together; the resulting number is assigned a letter grade according to the table below (there will be **no round-up**):

A	_____	90% and above
B	_____	80 – 89.99%
C	_____	70 – 79.99%
D	_____	60 – 69.99%
F	_____	59.99% and below

Class Format

Students are expected to prepare for lecture by read the assigned sections of the textbook, study the pre-lecture videos, and complete the assigned problem sets. Class time will feature quizzes, voting on conceptual questions through think-pair-share, discussion of concepts – mini lecture, and symbolic/numerical problem solving. Students are allowed to collaborate on symbolic/numerical problem solving but not during quizzes or the first phase of think-pair-share. On days where students collaborate to solve symbolic/numerical problems, a few minutes will be allocated towards the end of class to complete self/team evaluations; otherwise, the evaluation will be assigned as homework. These evaluations are used to gauge the level of contribution from each group member; it is designed to ensure fairness. Students will evaluate their team members based on a rubric; a sample of the attached to the end of this syllabus. The instructor reserves the right to modify the sample rubric at anytime.

Course Outcomes and Measurements

- Learning and understanding the physical principles related to the covered areas of physics
- Application of learning and understanding to the solution of appropriate problems
- Knowledge of the possibilities and limits of science

These program outcomes are promoted and actualized through instruction, peer learning/collaborative problem-solving, graded assignments, and examinations.

Mission Statements

- **ACU:** To educate students for Christian service and leadership throughout the world.

- **College of Arts and Sciences:** To educate students for worldwide Christian service and leadership through programs of study and other learning experiences that blend a liberal arts education with professional and career education.
- **Department of Engineering and Physics:** The ACU engineering and physics programs strongly support the university's mission of educating students for Christian service and leadership throughout the world.
- **Unique Christian Perspective:** The Christian worldview holds God as the creator of the universe and the Bible as the book of spiritual guidance. However, the Bible is not a book of science. Thus not much detail of the composition of the universe or governing physical laws is addressed. Generally, physics entails the aforementioned. Through physics, deeper insights into God's physical creation may be gained.

Academic Integrity

Violations of academic integrity and other forms of cheating, as defined in ACU's Academic Integrity Policy, involve the intention to deceive, mislead or misrepresent. They are a form of lying that represent actions contrary to behavioral norms that flow from the nature of God. Violations will be addressed as described in the Policy, but the most powerful motive for integrity and truthfulness comes from one's desire to imitate God's nature in one's life. Every member of the faculty, staff and student body is responsible for protecting the integrity of learning, scholarship and research. The full Policy is available at the Provost's office website <https://cdn01.acu.edu/community/offices/administrative/office-of-the-provost/academic-integrity-policy/overview.html>. Review of this policy is encouraged.

ADA Compliance

Abilene Christian University is dedicated to removing barriers and opening access for students with disabilities in compliance with ADA and Section 504 of the Rehabilitation Act. The Alpha Scholars Program facilitates disability accommodations in cooperation with instructors. In order to receive accommodations, students must be registered with Alpha Scholars Program and must complete a specific request for each class in which accommodations are needed. Students having a documented disability are invited to discuss academic accommodations directly with the Alpha Scholars office at (325) 674-2667. For an overview of the Alpha Scholars program please visit <https://www.acu.edu/about/uap/overview/>.

Anti-Harassment Policy

As a professor, one of my responsibilities is to help create a safe learning environment on our campus. I also have a **mandatory reporting responsibility** related to my role as a professor. It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and in our one-on-one meetings. I will seek to keep the information you share private to the greatest extent possible. When I am not able to keep your information confidential, I will only share it with responsible administrators on campus who can provide you with services and resources. I am required to share with the Title IX Coordinator information regarding sexual misconduct or harassment, dating or domestic violence or stalking that you report to me. If you would prefer to share information in a confidential setting, I encourage you to speak with someone in the ACU Counseling Center. For more information on this policy, please visit <https://www.acu.edu/human-resources/title-ix-and-sexual-misconduct-information/acu-titleix-policy-and-process/>.

SOAR Program

Student Opportunities, Advocacy and Resources (SOAR) Program is a campus program that supports ACU students on their path to success through additional academic, social or personal resources. The program is dedicated to walking alongside students through unexpected challenges, they partner with faculty and staff to build a caring community and create a safe environment for students to discuss and overcome the obstacles they face. Please visit SOAR's website for more details: <https://www.acu.edu/soar-program/>.

Criteria	Ratings					Pts
Workload	4 pts Excellent Did a full share of the work – or more; knows what needs to be done and does it; volunteers to help others.	3 pts Proficient Does an equal share of the work; does work when asked; works hard most of the time.	2 pts Basic Did almost as much work as others; seldom asks for help.	1 pts Unacceptable Did less work than others; doesn't get caught up after absence; doesn't ask for help.	0 pts Absent Did not show up to class.	4 pts
Discussions	4 pts Excellent Provided many good ideas; inspired others; clearly communicated desires, ideas, and feelings.	3 pts Proficient Participated in discussions; shared thoughts.	2 pts Basic Listened mainly; on some occasions, made suggestions.	1 pts Unacceptable Seemed bored with the problem at hand; rarely spoke up, or tried to steer the discussion off-topic.	0 pts Absent Did not show up to class.	4 pts
Preparation	4 pts Excellent Frequently initiates discussion or asks for help on confusing concepts; refers to content from both the pre-lecture readings and videos during problem-solving.	3 pts Proficient Initiates discussion or asks for help on confusing concepts; refers to content from both the pre-lecture readings and videos during problem-solving.	2 pts Basic Occasionally initiates discussion or asks for help on confusing concepts; sometimes refers to content from both the pre-lecture readings and videos during problem-solving.	1 pts Unacceptable Rarely initiates discussion or asks for help on confusing concepts; rarely refers to content from both the pre-lecture readings and videos during problem-solving.	0 pts Absent Did not show up to class.	4 pts
Providing Feedback	4 pts Excellent Habitually provides dignified, clear, and respectful feedback.	3 pts Proficient Gave feedback that did not offend.	2 pts Basic Provided some feedback; sometimes hurt feelings of others with feedback or made irrelevant comments.	1 pts Unacceptable Was openly rude when giving feedback.	0 pts Absent Did not show up to class.	4 pts
Receiving Feedback	4 pts Excellent Graciously accepted feedback.	3 pts Proficient Accepted feedback.	2 pts Basic Reluctantly accepted feedback.	1 pts Unacceptable Refused to listen to feedback.	0 pts Absent Did not show up to class.	4 pts
Total Points: 20						

Class	Day	Date	Breaks, Exams, and Quizzes
1	M	8/29	
2	W	8/31	
3	F	9/2	Ch. 1 Quiz
4	M	9/5	Ch. 2 Quiz
5	W	9/7	
6	F	9/9	
7	M	9/12	Ch. 3 Quiz
8	W	9/14	
9	F	9/16	EXAM 1
10	M	9/19	Ch. 4 Quiz
11	W	9/21	
12	F	9/23	
13	M	9/26	Ch. 5 Quiz
14	W	9/28	
15	F	9/30	
16	M	10/3	Ch. 6 Quiz
17	W	10/5	
18	F	10/7	EXAM 2
19	M	10/10	Ch. 7 Quiz
20	W	10/12	
21	F	10/14	
22	M	10/17	Ch. 8 Quiz
23	W	10/19	
24	F	10/21	No Class -- Fall Break
25	M	10/24	Ch. 9 Quiz
26	W	10/26	
27	F	10/28	EXAM 3
28	M	10/31	Ch. 10 Quiz
29	W	11/2	
30	F	11/4	
31	M	11/6	Ch. 12 Quiz
32	W	11/9	
33	F	11/11	
34	M	11/13	Ch. 13 Quiz
35	W	11/16	
36	F	11/18	EXAM 4
37	M	11/20	Ch. 14 Quiz
38	W	11/23	
39	F	11/25	No Class -- Thanksgiving
40	M	11/27	Ch. 15 Quiz
41	W	11/29	
42	F	12/2	
43	M	12/4	Ch. 16 Quiz
44	W	12/6	
45	F	12/9	EXAM 5