

Abilene Approval Chart for Curriculum Changes

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

Course Number PHYS 203 Physical Science for Teachers 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 203 Physical Science for Teachers 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	TFC	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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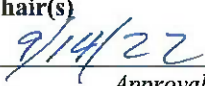
	Change to the University Requirements (All Campuses)	Dept./School ¹	College	Dean	TEC	UGEC	AAAC/Crad	Provost	Faculty	President	Trustees
1.	University Requirements — Change course outcomes of an included course ²	A	A	A	—	A	—	A	—	A	—
2.	University Requirements — Add or drop a required course from the University 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)	
 _____ <i>Signature</i>	 _____ <i>Approval date</i>
_____ <i>Signature</i>	_____ <i>Approval date</i>

College Academic Council(s)	
_____ <i>Signature</i>	_____ <i>Approval date</i>
_____ <i>Signature</i>	_____ <i>Approval date</i>

Dean(s)	
_____ <i>Signature</i>	_____ <i>Approval date</i>
_____ <i>Signature</i>	_____ <i>Approval date</i>

Teacher Education Council	
_____ <i>Chair's signature</i>	_____ <i>Approval date</i>

University General Education Council	
_____ <i>Chair's signature</i>	_____ <i>Approval date</i>

Abilene Undergraduate Academic Council	
_____ <i>Chair's signature</i>	_____ <i>Approval date</i>

Graduate Council	
_____ <i>Chair's signature</i>	_____ <i>Approval date</i>

Provost	
_____ <i>Signature</i>	_____ <i>Approval date</i>

Faculty	
_____ <i>Chair of Faculty Senate</i>	_____ <i>Approval date</i>

President	
_____ <i>Signature</i>	_____ <i>Approval date</i>

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 203, Physical Science for Teachers
Terms offered:	Spring
Catalog description:	A science course of primary interest to pre-service teachers. The course uses inquiry-based and other "best-practice techniques" to apply physical science concepts to situations within the world and at the same time applicable to the future teacher's classroom. May be used to satisfy University Requirements.
Course prerequisites:	
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 yes, continue to 3. If no, 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).

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 providing a broad overview of topics related to physical science aimed at elementary teachers. This provides them the broad science knowledge they need to teach science to their future students. They also learn how to teach science and observation to elementary students so they can also draw informed conclusions about the physical world they live in.

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

Students learn about many physical phenomena with an emphasis on conceptual understanding of data presented in graphs and diagrams from many different physical systems like particle motion, geology, astronomy, weather, etc. They learn how to apply multiple different models such as Newton's laws of motion to these topics.

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

Students get to add many new areas of physical science to their content knowledge as they prepare to be elementary teachers. They also see techniques to help them teach these concepts to elementary students helping them tie these ideas to techniques learned in their other courses.

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	Semester project
Outcome C3	FCI
Outcome C4	FCI

The semester project requires significant work from students to quantitatively study different observable phenomena. The overall grades for these projects will be used to set the scores for Outcome C2.

The Force Concept Inventory is a nationally administered pre/post test assessment. Data from participating institutions is used to create the normalized expectations used to evaluate and compare nationally. We are asked to protect the integrity of this assessment so I will not attach it but can provide it if needed. Outcome C3 uses the average score for questions related to graphs, diagrams, or equations which mirrors the national approach on scoring the assessment. For outcome C4 we will evaluate the normalized gain between the pre and post tests which also replicates the national approach.

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 available points will be placed in the “Shortcomings” category. Students earning between 60% and 90% will be placed in the “Meets Expectations” category, and students earning 90% or higher will be placed 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 selected questions correctly will be placed in the “Shortcomings” category. Students earning between 60% and 90% will be placed in the “Meets Expectations” category, and students earning 90% or higher will be placed 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 Syllabus

COURSE DESCRIPTION:

Catalog Description: A science course of primary interest to pre-service teachers. The course uses inquiry-based and other "best-practice techniques" to apply physical science concepts to situations within the world and at the same time applicable to the future teacher's classroom. This class may be taken by any student to satisfy a science general education requirement.

Course Number: PHYS 203.01
Course Title: Physical Science for Teachers
Credit Hours: 3
Class Meeting Times: Tuesday and Thursday from 8:00-9:20 AM

COURSE INSTRUCTOR:

Professor: Dr. Jess T. Dowdy

Office: Onstead 113

Office hours: T, R 9:30 – 11:00 AM,
 Wednesday 1:00 – 4:00 PM

Other office hours gladly by appointment, or feel free to just come in if I am in my office.

Phone: 674-4825 (office)
 325-269-1965 (phone/text)

Email: jess.dowdy@acu.edu

Course Description and Goals

The basic aim of the Next Generation Physical Science of Everyday Thinking format is to allow you to take charge of your own learning, with the instructor as a guide. I hope you will find many of the teaching and learning strategies valuable and appropriate for you to use when you begin your teaching career.

Student Learning Objectives

1. Physical Science Content: To help you develop a deep understanding of physics and chemistry ideas that can be used to explain interesting phenomena, and are related to the ideas included in the elementary school science curriculum;
2. Nature of Science: To help you practice and develop an understanding of how knowledge is developed within a scientific community: that doing science involves using evidence and creative thinking, that knowledge is established through collaboration and consensus, and that science knowledge can change over time;
3. Science pedagogy: To help you develop your science pedagogy skills we will be reading selected articles on how we teach and learn and applying them to science learning scenarios.
4. Learning about learning: To help you become more aware of how your own science ideas change and develop over time, and how the structure of the learning environment and curriculum facilitate these changes.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

- Engage in the process of developing scientific knowledge
- Explain the role of force and energy in physical interactions
- Predict correctly physical phenomena interactions.

Required Texts/Readings

Textbook

The Physical Universe by Krauskopf and Beiser, (16th edition with Wiley Connect)

You are responsible for all material in the text, as well as additional material presented in class. Unless indicated otherwise in class, every section of every chapter is "fair game" as a source of test or discussion questions, even if not discussed in detail in class. The most important topics will be covered in detail; some minor points will be left for you to spend time with on your own. We will also consider a number of special topics as the semester progresses. You will be responsible for these topics as well as the text-topics. It is important for you to ask questions in class or to see me outside of class if problems arise regarding anything that was not made clear in the text or in the lectures.

CLASS ATTENDANCE:

Attendance at every class proves essential since material not found in the text shows up later on exams. Attendance is not taken, but each class period contains work that counts in your overall grade. There is no makeup work for any work that occurs during your absence. If you are absent, you get a zero for any work given that day, with no exceptions other than those that gain Provost approval¹ in advance. If you miss a test, there are no makeup exams without the Provost approval in advance. Because the Provost approves these in advance, any work missed can be made up in advance of the absence. For cases of hospitalization or other prolonged serious illness, arrangements possibly may be made on a case-by-case arrangement for makeup work.

¹Preadvanced absences, such as for example, a typical of sports or academic out of class activity, require a form signed by the Provost. A student who is required to be absent from a class to participate in a university activity approved by the academic administration will not be penalized by professors for missing class provided that the procedures noted on the Advance Approval for Absence form are followed. However, the student should not be permitted to participate if he or she has absences of more than nine MWF meetings, or six TR meetings, or three meetings of a one-day-per-week class. These include "approved absences" under this policy as well as other absences.

(<http://www.acu.edu/academics/provost/forms.html>).

CLASS DEMEANOR:

Questions or observations are encouraged during the class period. Severe cases, as decided by the professor, of disruptive behavior will not be tolerated, and will result in dismissal from class, with a grade of F (for the entire semester), if exhibited. Example: Threatening someone in the class with a weapon.

ACADEMIC INTEGRITY:

Given the unlikely event that anyone becomes involved in academic integrity issues, that person, and any collaborators, will receive a grade of "F" in the course. For this case, no withdraw grades are allowed.

Rationale for Policy

The most powerful motive for integrity and truthfulness comes from one's desire to imitate God's nature in our lives. As a community of Christian students and scholars, we are each responsible to expect behaviors from each other consistent with the nature of God, to respect the community, and to respect ourselves.

Expectations of academic honesty and integrity extend to both university employees and students. Every member of the community is responsible for protecting the integrity of learning, scholarship, and research. Being responsible requires action against violations in spite of peer pressure, loyalty, or compassion. Individuals must take responsibility for their own conduct and discourage misconduct by others.

Definition of Academic Integrity

Academic Integrity is defined as academic work completed as assigned for each class by the individual or group responsible for the work. Academic work includes but is not limited to reading assignments, assessments, examinations and tests, attendance at required out-of-class activities, written or oral presentations, and laboratory experiments and research.

Violations of academic integrity and other forms of cheating involve the intention to deceive or mislead or misrepresent and therefore, are a form of lying. Specific examples of academic dishonesty in this course include, but are not limited to, the following:

- Submitting for credit, in whole or in part, the work of others.
- Receiving, giving, or using unauthorized aid on an examination.

- Intentional or unintentional failure to give credit to sources used in a work in an attempt to present the work as one's own.
- Submission of paper(s) or project(s) obtained from any source, such as a research service or a club paper file, as one's own.
- Allowing other members of a group to provide a disproportionate fraction of a required group project or activity.
- Claiming credit for an attendance or service activity without attending or performing the activity.
- Written or oral presentation of falsified materials and facts, including but not limited to the results of interviews, laboratory experiments, and field-based research.

CLASS PARTICIPATION:

During each class period the class will engage in inquiry based learning projects. These projects consist of worksheets, on-line submissions, etc that will be turned in for a portion of your participation grade. Participation with projects and assignments will also be monitored in addition to the worksheets. The participation grade is worth 20% of your overall grade.

EXAMS AND QUIZZES AND FINAL:

There are multiple Exams and Quizzes this semester. 40% of your grade will be derived from this category.

RESEARCH:

During this class you will obtain 20% of your overall grade from a research project and presentation. You will learn more about this project in the near future.

HOMEWORK:

During this class there will be homework assigned regularly. 20% of your grade will be derived from this category.

FINAL GRADES:

Your final grade will be calculated by using the following:

- 20% Participation
- 40% Midterm and Final
- 20% Research Project and Presentation
- 20% Homework

You will earn a grade according to the scale below:

90 to 100%	A
80 to 89.99%	B
70 to 79.99%	C
60 to 69.99%	D
Less than 60%	F

DESIRED COURSE COMPETENCIES:

	Competency	Measurement
1	Analyze problems, concepts, issues, claims, and situations using scientific methodology.	Test
2	Solve problems that imbed science principles into the solution.	Test
3	Engage in a science education research project.	Presentation and Report
4	Translate written statements into physics concepts and problems and then solve the problems to develop analytical skills.	Test
5	Demonstrate comprehension of fundamental principles and relationships in the natural sciences.	Test
6	Understand the possibilities and limits of science and experimentation.	Test
7	Students, after taking this class, should be prepared to take the science portion of the teacher exit exams related to physics, earth science, and astronomy.	Test

Appropriate Student Learning Outcomes

- 1) Knowledge - Demonstrate an understanding of the basic knowledge, terminology or elements appropriate to the discipline.
- 2) Inquiry - Demonstrate an understanding of the fundamental elements (methodology or theoretical framework) for sound inquiry and analysis appropriate to the discipline

- **ADA Compliance Statement**
"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, you must be registered with Alpha Scholars Program, and you must complete a specific request for each class in which you need accommodations. If you have a documented disability and wish to discuss academic accommodations, please call our office directly at 325-674-2667."

KEYS TO SUCCESS:

- **Keys to success:**
 - Be here.
 - Be prepared.
 - "Work" in class.
 - Communicate with me. Do this, if at all possible, before a problem arises. Most problems have simple solutions ahead of time, but often can't be corrected after the fact. If you were unable to contact me ahead of time, you should contact me ASAP afterwards.

**The mission of ACU:
To educate students for Christian service and leadership
throughout the world.**

