

Application for a New Course v9

Course ID <i>Subject and Number</i>	PHYS 203
Date APPROVED	
Date DENIED	

I. Systems and Catalog Information Complete each item.

1	Course Developer	Jess Dowdy
2	Course Teacher	A member of the Engineering and Physics Department faculty
3	Course Title	Physical Science for Teachers
4	Course Abbreviation (if title is over 30 characters)	N/A
5	College	College of Arts and Sciences
6	Department	Engineering and Physics
7	Number of Credit Hours	3
8	Is the course Fixed Credit or Variable Credit?	Fixed
9	Is the course repeatable?	No
10	Maximum number of times course may be repeated	Zero
11	Maximum number of hours credit	3
12	Explanation for variable credit	N/A
13a	Course contact hours - LEC	3
13b	Course contact hours - Lab	0
13c	Course contact hours - Practicum	0
13d	Course contact hours - Seminar	0
13e	Course contact hours - Studio	0
13f	Course contact hours - Online	0
13g	Course contact hours - Colloquium	0
13h	Course contact hours – Field Experience	0
13j	Course contact hours - Internship	0
13k	Course contact hours - Research	0
13m	Course contact hours - Workshop	0
13n	Course contact hours – Other (specify)	0
14	Instructor Workload	3
15	Grade Mode (check all appropriate):	☒ X Standard Credit/No Credit (undergrad only)
16	Maximum Enrollment	30
17	Catalog Description (50 words or less)	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.
18	List any prerequisites (course/s, test scores, class standing, major, etc.)	None
19	List any co-requisites	None
20	If the course is cross listed, specify the Course ID(s) MUST have signature in Section V off all Department Chairs	None
21	Does this course have any special student costs? Yes/No <i>Attach a <u>completed</u> "Request to Add or Change Course Fees" form. Describe in section IV-F.</i>	None
22	How often will it be offered? Fall	Yes
23a	How often will it be offered? Spring	Yes
23b	How often will it be offered? Summer	As needed
23c	How often will it be offered? Fall	Yes
24	Frequency?	Every Year
25	First semester this course will be offered <i>New courses may not be taught under their approved course ID until they appear in the catalog, therefore, no earlier than the coming fall.</i>	Fall 2014
26	List course/s that should be deleted, include the last semester for course/s being deleted <i>A course cannot be deleted when it is a requirement in a degree plan in any department.</i>	None
27	Is this course required for a degree/s? Yes/No <i>If "Yes," attach a revised degree plan(s) reflecting the placement of the new course.</i>	Not yet. Since this is a change to a degree plan in the College of Education and Human Services, an approval chart with the degree plan changes will need to go through the CEHS Academic Council as well as the Teacher Education Council. This should be done after the course is approved. See attached e-mail from education department supporting this class.
28	Has this course been offered as a Special Topics course? Yes/No <i>If "Yes," specify the Course ID and enrollment for each term it was taught.</i>	Yes Fall 2013 – PHYS 240 – Enrollment 25
29	List any courses in which content overlaps the proposed course. (Course ID and Name) <i>Attach statement from instructor/dept</i>	None

	<i>chair of existing course justifying the new offering in Section IV-D.</i>	
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II. Curriculum

1	Degree Plan Explanation of how this course affects degree requirements.	This course intends to become a science general education requirement for teachers. The content matches the teacher certification exams and framework. Education degrees will most likely be requiring this class. Please see attached letter.
2	Justification State the justification for adding this course to the current curriculum. Represent the need	Both biology (BIOL 203) and chemistry (CHEM 203) have on the books a science course applicable to pre-service teachers. Physics lags behind in implementing a class specifically aimed at teachers. The future teachers will be required to pass the science portion of the state certification exam beginning in 2014, with a major component of the exam focused on physics concepts. Cooperatively, with chemistry, biology, and the education department, this class is being developed to help students pass the certification exams. Please see attached letter.

III. Course Design

1. Audience and Course Goal

1	Describe the intended audience, including prerequisite skills.	The students will primarily be pre-service education majors. However, the course may be used by anyone wanting to satisfy a science general education requirement.
2	State the overarching course goal(s) in performance terms.	1) Students should gain a better understanding and appreciation for the physical universe. 2) Students should be able to incorporate scientific principles into everyday situations. 3) Students will be able to research a science education technique or content area and apply it in the classroom. 4) Students should be able to think about the relationship of faith to their life as a future teacher of science.

2. Competencies and Measurements

	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
8		
9		

3. Text and Resources

1. Give the full publication information of the textbook/s and other required resources and outside readings.

Krauskopf, K.B., Beiser, A, The Physical Universe, fifteenth edition, 2014.
ISBN 978-0-0-07-351392-8

2. For **combined undergraduate/graduate** courses, make two lists:
 - a. full publication information; label **Undergraduate**.
 - b. full publication information; label **Graduate**. Indicate number of pages required.

IV. Supporting Documentation

Supporting documents must accompany proposal prior to preliminary approval by chair and dean.

1	Library — Submit new course application and syllabus to the Director of the Library. Consult with the director and establish a deadline for completion of the library report. Attach the signed copy of the library director's report.
2	Instructional Design — The application and syllabus must be reviewed by the Adams Center. Attach a copy of the Adams Center Review Letter.
3	Degree Plan — The impact of the course must be reviewed by the Director of Curriculum. Attach degree plan signed by the Director of Curriculum.
4	Content Overlap — Include one document for each course you listed in Section I-I. Attach statement from instructor/dept chair of existing course justifying the new offering.
5	Departmental Resources — List the resources that support the course and are available only through the department, if applicable. Attach the list of the holdings and the location/s.
6	Resources — List resources (other than library or departmental resources) that are needed to support this course (computers, lab equipment, other technology, etc.). Attach a complete list of all items and indicate possible sources or estimated cost of each. List the sources of any needed funds.
7	Expenses — List additional expenses needed to implement this course (full-time or part-time faculty, graduate or lab assistants, student employees, travel, special student costs, room renovation, storage facility, etc.). Attach a complete list of all items, the estimated cost of each and the source of the funds.
8	Justification — Attach all documents referred to in Section II-2
9	Syllabus — Attach the syllabus for the course based upon the anticipated first-semester offering.
10	Provide documentation for all additional attachments here

V. Preliminary Approvals

All supporting documentation has been assembled and attached to this application. I believe this course is ready to be presented to appropriate councils. We have a plan to fund this new course.

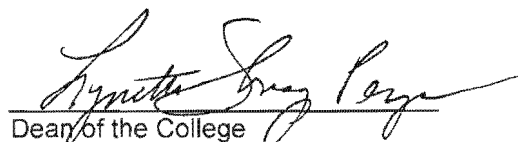
Primary Department



Department Chair

2-24-14

Date



Dean of the College

2-24-14

Date

Cross-listing Department *Add more lines if multiple departments are cross-listing*

Department Chair

Date

Dean of the College

Date

Cross-listing Department *Add more lines if multiple departments are cross-listing*

Department Chair

Date

Dean of the College

Date

VI. Approvals *Place all approvals on one page.*

A. Course ID: PHYS 203

Course Title: Physical Science for Teachers

1. College Academic Council Action: (for all courses)

Note: Insert additional lines for College Academic Council action for each college involved in cross-listed courses

Approved X Denied *Lynette Shroy Berg* 2-24-14
College Dean or Director Date

Approved Denied
College Dean or Director Date
Teacher Education Council

2. Graduate Council Action: (for graduate level courses)

Approved ✓ Denied *[Signature]* 3-17-14
Dean of Graduate School Date
Chair of Teacher Education

3. University Undergraduate Academic Council Action:

For undergraduate level courses only

Approved Denied
Associate Provost Date

4. University General Education Council Action: (when applicable)

Approved Denied
Provost or designee Date

5. University Budget Committee Action: (when applicable)

When applicable – see New Course Application Instructions

Approved Denied
Chair, University Budget Committee Date

6. Academic Provost Action: (for all courses)

Approved Denied
Provost Date

7. President of the University Action: (for all courses)

Approved Denied
President Date

Attach notes, comments, or conditions from appropriate councils:

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:	Foster Science Bldg. 353
Office hours:	Tuesday 1:00 - 5:00 Thursday 1:00 - 5:00

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

Phone:	674-4825 (office) 903 - 353 - 2329 (phone/text)
Email:	jess.dowdy@acu.edu

TEXT:

We will cover chapters 1-5, and 14-19 in our required text, The Physical Universe by Krauskopf and Beiser, 15th edition, 2014, McGraw Hill, ISBN: 978-007-351392-8. 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.

¹Prearranged 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 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 15% of your overall grade.

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.

EXAMS:

There are 4 exams during the semester worth 10% each. The "Final Exam" is comprehensive in nature and counts as 15%.

HOMEWORK:

During this class there will be homework assigned almost every class period. The homework portion of this class will count as 10% of your overall grade.

FINAL GRADES:

Your final grade will be calculated by using the following:

20%	Research Project	_____ / 200
15%	Participation	_____ / 150
10%	Test #1	_____ / 100
10%	Test #2	_____ / 100
10%	Test #3	_____ / 100
10%	Test #4	_____ / 100
15%	Final	_____ / 150
10%	Homework	_____ / 100
Total		_____ / 1000

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

- **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.**

Course Schedule

(Tentative and subject to change. HW Assignments not all added in for example...but good to give you an overall general view.)

Week #1

Class #1: August 25, 2014
Discuss Syllabus
Turn in Class Agreement
TOSRA (Participation #1)
Homework (HW#1): Paper on the difference between science and technology.

Class #2: August 27, 2014
Turn in HW#1 at the beginning of class.
Group Discussion: What is Science?
Why is Technology different than science?

Homework: Read Chapter 1

Week #2

Class #3: September 2, 2014

Tower exercise (Participation #2) (20 min)

History of science in consolidated form. (rest of period)

Homework (HW#2) Find a pre 1800 AD scientific finding and describe why it was important during its time.

Class #4: September 4, 2014

Motion, Speed, Acceleration, Vectors, Distance, Time

Turn in HW#2 at the beginning of class.

Week #3

Class #5: September 9, 2014

Acceleration due to Gravity, Free Fall, Air Resistance

Class #6: September 11, 2014

Laws of Motion, Mass, Weight, Newton's Law of Gravity, Circular Motion, Satellites

Week #4

Class #7: September 16, 2014
Attend a Summit Talk
Turn in a descriptive essay about the talk.

<http://www.acu.edu/academics/cbs/centers-services/ministryevents/summit/>

Class #8: September 18, 2014
TEST #1

Week #5

Class #9: September 23, 2014

Pendulum Experiment, Work and Energy, Conservation of Energy

Class #10: September 25, 2014

Simple Lever Experiments, Momentum

Week #6

Class #11: September 30, 2014

Conservation of Momentum, Research Project Outlined

Class #12: October 2, 2014

Fluids, Pressure, Buoyancy, Gas Laws, Kinetic Theory of Gases,
Thermometer Examples

Week #7

Class #13: October 7, 2014

Motion Experiment, Atmosphere, Weather, Seasons, Clouds, Wind,
Weather Systems

Class #14: October 9, 2014

Climate, Hydrosphere, Ocean Currents

Week #8

Class #15: October 14, 2014

Test #2

Class #16: October 16, 2014

Rock Cycle, Minerals, Types of Rocks

Week #9

Class #17: October 21, 2014

Earthquakes, Earth Structure, Geomagnetism

Class #18: October 23, 2014

Erosion, Volcanoes

FALL BREAK October 24, 2014

Week #10

Class #19: October 28, 2014

Evolving Earth, Plate Tectonics

Class #20: October 30, 2014

Research Project Discussion

Week #11

Class #21: November 4, 2014

Historical Geology, Earth History

Class #22: November 6, 2014

CAST Conference, Research Project Day

Week #12

Class #23: November 11, 2014

Test #3

Class #24: November 13, 2014

The Solar System, Planets, Satellites, Moon

Week #13

Class #25: November 18, 2014

Eclipses, Phases of the Moon
Scaling Activity

Class #26: November 20, 2014

Stars, Telescopes, Sun

Week #14

Class #27: November 25, 2014

Stellar Distances, Stellar Lifecycles, Stellar Motion, Supernovas, Galaxies,
Doppler Shifts, Big Bang, Travel to the Distant Stars

Class #28: November 26, 2014

THANKSGIVING HOLIDAY – NO CLASS

Week #15

Class #29: December 2, 2014

Test #4, Evaluations

Class #30: December 4, 2014

Present Research Projects

Week #16

FINALS WEEK

Class #31: Comprehensive Final Exam

<http://www.acu.edu/campusoffices/registrar/finalexams/scheduleB.html>

Dana Pemberton <dlp94a@acu.edu>

To: "Dr. Jess Dowdy" <jtd10a@acu.edu>, Rusty Towell <rxt01a@acu.edu>

Re: Physical Science course

December 3, 2013 1:35 PM



Dear Dr. Towell and Dr. Dowdy,

Thank you so much for your efforts on behalf of elementary teacher candidates. As you know, the new testing policies will increase the level of content knowledge required for candidates seeking certification for elementary settings. This course is a crucial part of the plan to prepare these students for success, not only on the certification exam, but also in the classroom. It is imperative that courses be provided with consideration of the content for which they will be accountable. We were using PHYS 102 to provide them with physical science content. However, because this is a non-majors course and is taught for broad audience, it was neither demanding enough nor appropriately focused. Dr. Dowdy has worked hard to develop a course with a difficulty level somewhere between PHYS 102 and General Physics -- a level appropriate for teachers of science through 6th grade.

Again, I strongly support this course. In fact, Dr. Dowdy and I have had multiple conversations about the necessity for the course and the content it should include. Again, thank you for your efforts to join us in preparing exemplary teachers for service in today's classrooms.

Sincerely,

Dana Kennamer Pemberton

ABILENE CHRISTIAN UNIVERSITY

Educating Students for Christian Service and Leadership Throughout the World

Abilene, Texas 79699 • www.acu.edu • 325-674-2000



December 3, 2013

Dr. Jess Dowdy
Foster Science Bldg. 353
Abilene Christian University
Tel: (325)674 4825
Email: jess.dowdy@acu.edu

Re: Review of PHYS 203.01

Dear Dr. Dowdy,

Thank you for the submission of the application for the new PHYS 203.01: Conceptual Physical Science for Teachers. We reviewed the syllabus based on the ACU Syllabus Guidelines. You did a wonderful job laying out the outline of this course in great detail so that students will see clearly what to expect in each class.

Based on this guideline, I wrote down some questions or suggestions, which I will include at the end of this letter for you to consider before presenting the syllabus to the Council for approval. If any of my description is not clear, please feel free to call me for clarification. My phone number here is (325)674-2981. My office is located at the Adams Center.

If there are any other aspects of the application or course development you would like to discuss further, please let me know as well. I will be happy to discuss with you. Please know the Adams Center is here to serve you in any aspect of your course development, implementation, and/or ongoing teaching of the course.

Again, thank you for allowing the Adams Center team to review your course application and if there is any way we can serve you, please know we are here to serve you.

Director, Instructional Design,
Adams Center

Questions or Suggestions

1. I cannot find "special needs policy (ADA) or link which you might want to include in your syllabus.
2. I cannot find a catalog description of the course in the syllabus.
3. You may need to re-group some of your syllabus items. For instance, you may need to group course policies together in a section, and assessment items together in another section, and this would add clarity to the syllabus narration. You currently add "research", and "exams" together with "behind class attendance and class participation" and then you return to "cheating" and "academic dishonesty" which are again policies.
4. Similarly at the beginning of the document, you have the course outcomes, and after your grading policies, you have "course goals". I wonder if you can group outcomes and goals in a section.
5. In your "desired course outcomes section", you state one of the outcomes as "solve real life problems". You may want to re-define "real life problems" in terms of the subject you are teaching in this course.

ABILENE CHRISTIAN UNIVERSITY

LIBRARY

M E M O R A N D U M

DATE: February 24, 2014
TO: Dr. Jess Dowdy
FROM: Mark McCallon, Associate Dean for Library Services
RE: Course Application for PHYS 203- Physical Science for Teachers

After reviewing the course application and syllabus, the library can support the proposed course. Please contact Mark McCallon (mccallonm@acu.edu), Librarian Liaison to the Department of Engineering and Physics, if you will require additional library resources in the future for supporting the course. Thank you for letting us review the course application.