

Submit original with signatures + 1 copy + electronic copy to Faculty Senate (Box 7500).
 See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for a complete description of the rules governing curriculum & course changes.

TRIAL COURSE OR NEW COURSE PROPOSAL

SUBMITTED BY:

Department	Physics	College/School	CNSM
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1. ACTION DESIRED

(CHECK ONE):

Trial Course

New Course

2. COURSE IDENTIFICATION:

Dept

PHYSICS

Course #

094

No. of Credits

6

Justify upper/lower division status & number of credits:

This developmental distance-delivered physics course is designed for the underserved college and high school student population in rural regions of Alaska where a face-to-face physics course is rarely available.

This six-credit (5 credits lecture, 1 credit lab) course bridges the fall and spring semesters, allows increased content delivery as well as more adequately meeting the scheduling challenges of rural students across Alaska.

Lecture: (210 contact min./week)x(24 weeks) = 5040 min/ 800min/cr. >5cr.

Laboratory is broken into 3 components to meet needs of distance students:

(2820min)/ (2400min/Credit) >1cr.

- 1) Hands-on experiments ((70 contact min./week) x (24 weeks) with an additional 9 hours off-line
- 2) Experiment Session (additional 4 hours to perform experiment)
- 3) Group Collaborative Experiment (additional 6 hours to collect data)

3. PROPOSED COURSE TITLE:

Bush Physics for the 21st Century

9. CONTACT HOURS PER WEEK:

3.5

LECTURE
hours/weeks

1.16

LAB
hours /week

0

PRACTICUM
hours /week

minutes in non-science lab=1 credit. 2400-4800 minutes of practicum=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/guidelines-for-computing-/> for more information on number of credits.

OTHER HOURS (specify type)

9 hrs off-line on weekly lab experiments; 4 hrs in-depth experiment; 6 hrs group collaborative experiment data collection

10. COMPLETE CATALOG DESCRIPTION including dept., number, title, credits, credit distribution, cross-listings and/or stacking (50 words or less if possible):

Physics 094: Bush Physics for the 21st Century (BP21), 6 credits.

RESTRICTIONS ON ENROLLMENT (if any)

14. PREREQUISITES

Placement in DEVM105 or satisfactory high school Algebra 1 with instructor permission.
Additional prerequisites for High School Students: Must have passed the Alaska High School Exit Exam, and instructor permission based on school official/math teacher assessment of student's math preparation.

These will be *required* before the student is allowed to enroll in the course.

15. SPECIAL RESTRICTIONS, CONDITIONS

none

Has a memo been submitted through your dean to the Provost for fee approval?

no

17. PREVIOUS HISTORY

Has the course been offered as special topics or trial course previously?

Yes/No

Yes

DEVS E104 Spring 2008 (Lec. 4/17/07, Lec. 4/24/08), DEVS E104 Spring 2009 (Lec. CBN)

- 2) Instructor led introduction to experimentation and university lab courses with a more in-depth experiment and report. Lab instructor in the village school also is "scientist in residence" for school while there.
- 3) GCE- place based collaboration and presentation via distance.

-This course uses examples from traditional and modern life in rural Alaska, including 21st-century examples of high-latitude technology, and emphasizes problem solving strategies to explain basic concepts in physics.

Draft Syllabus for Trial Course PHYS 094 Course: *Bush Physics in the 21st Century*
(6 credit, distance course including a Laboratory)

D. Solie
February 2012

BUSH PHYSICS FOR THE 21ST CENTURY

BUSH PHYSICS for the 21st Century

**A Distance Delivery College/High School
Physics Course Targeting:**

- *Alaska Native and Rural Students*
 - *Small Village Schools*
 - *Native Cultures*



(Photo: M. Parsons)

1) Course Information:

Title: *Bush Physics for the 21st Century (with Laboratory)*

Course Number: PHYS 094 dual credit developmental physics course Late Start-Fall /Spring
2012/13, CRN # (-----)

Credits: 6 (5 credits lecture + 1 credit Laboratory)

Prerequisites:

Course Prerequisites: Basic high school Algebra 1 and permission of Instructor

credit lab course, and more adequately meets the scheduling challenges of rural students across Alaska. The course is delivered via videoconference, and web-based UAF BlackBoard. Students complete a

experimental study with instructor guidance. In addition, students participate in a group collaborative experiment where they make basic scientific measurements to precisely locate their village and then collaborate with others in the course to determine the size of our planet.

Course Content: Emphasizing problem solving strategies in physical science. DD21 uses basic algebra

and lab through written assignments and exams.

2. Demonstrate a scientific understanding of physical experiment using words, mathematical analysis, graphing and excel spreadsheets in lab reports.

3. Demonstrate an intermediate understanding of the scientific method (design, data collection,

analysis and interpretation of experiments)

4. Improve collaborative skills.
5. Improve presentation skills (orally and in writing).

7) Instructional Methods:

Lecture/Recitation sessions are delivered via video conference, recorded and then posted to the VCS content server. eLive will also be utilized to communicate with students during office hours, or special sessions. Course readings and additional online material are on UAF BlackBoard (BB).

- Weekly homework assignments will average roughly 6-8 problems (17 homework sets total) and are due one week after assignment unless otherwise specified.
- Late homework, as a rule, will not be accepted (special exceptions: medical or technical

some short answer. They will cover concepts and examples from the text, lecture material, homework

problems, and recitation problems. Solutions to exams will be posted on Black Board.

- **DISTANCE STUDENTS:** Exams must be taken with a qualified proctor (exams are to be FAXed or scanned & emailed to the instructor. If necessary a hard copy of exams can be mailed to the instructor.)

Exam Dates:

1. **Exam 1:** In Class Thursday 15 November (1 hr. covering Newton's Laws and Mechanics)
2. **Exam 2:** In Class Thursday 13 December (1½ hr. covering Fall Material—Mechanics and Thermodynamics.)
3. **Exam 3:** In Class Thursday 22 February (1 hr. tentatively covering waves, sound and light)

4. **Final Exam:** In Class Thursday 2 May (2+ hours comprehensive: covers all fall and spring material,)

Laboratory: Laboratory skills are crucial to success in science and engineering at the university. To pass this course you must pass the laboratory portion of the course. The Laboratory portion of this course has three components:

significant out of class time. Data collection must be done during spring break and will require at least 6-8 hours, or more, spread over several days. Note: If weather or other factors beyond the students control preclude the student from making the necessary measurements, an alternative assignment will be provided.

8) Course Calendar:

Course Schedule (Daily):

Presentation of new concepts /examples/demonstrations

9	26-29 Nov	Ch. 11 & 13	Intro Thermodynamics: Temperature, Ideal Gas Law and The First Law	Lab 6: Phase change
10	3-5 Dec.	Ch. 13	Thermodynamics Cont.	Exam Review
11	10-13 Dec.		Review for Exam2	Exam 2
	17Dec. - 16 Jan		HOLIDAY BREAK	Holiday Break
12	17 Jan.			GCE Introduction

	Apr.		Physics and Space	
25	2017		Final Exam	

LABORTORY:	20%
a) Weekly Labs (12 (lowest 1 dropped) (10%)	
b) Experiment Session: (5 %)	
c) Group Collaborative Experiment (5%)	

TOTAL:	<u>100%</u>
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11) Support Services: Instructors will work with the student to help them obtain additional tutoring if necessary (either local one-on-one, or via distance communication).

12) Special Needs: The office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. We work

to students with disabilities.