COLLEGE OF THE DESERT

Course Code PH-002B

Course Outline of Record

1. Course Code: PH-002B
2. a. Long Course Title: College Physics II
   b. Short Course Title: COLLEGE PHYSICS II
3. a. Catalog Course Description:
   This is an algebra and trigonometry-based physics course designed for majors not seeking a degree in the sciences or engineering. This course is the second semester of the Physics 2 sequence. Topics include electricity, magnetism, optics, and selected topics from modern physics. This course is offered in the Spring semester of odd-numbered years.

   Note: The physics 2 sequence satisfies the physics requirement for some pre-professional students.
   b. Class Schedule Course Description:
   This is an algebra and trigonometry-based physics course designed for majors not seeking a degree in the sciences or engineering.
   c. Semester Cycle (*if applicable*): N/A
   d. Name of Approved Program(s):
   - PHYSICS
4. Total Units: 4.00 Total Semester Hrs: 108.00
   Lecture Units: 3 Semester Lecture Hrs: 54.00
   Lab Units: 1 Semester Lab Hrs: 54.00
   Class Size Maximum: 28 Allow Audit: No
   Repeatability No Repeats Allowed
   Justification 0
5. Prerequisite or Corequisite Courses or Advisories:
   Course with requisite(s) and/or advisory is required to complete Content Review Matrix (CCForm1-A)
   Prerequisite: PH 002A
6. Textbooks, Required Reading or Software: *(List in APA or MLA format.)*
   a. Young,H. & Geller, R. (2011). *College Physics* (9/e). San Francisco, CA Pearson Addison Wesley.
   College Level: Yes
   Flesch-Kincaid reading level: 12
   b. Coletta, Vincent (2010). *Physics Fundamentals* (2/e). Lakeville Physics Curriculum and Instruction. ISBN: 0971313458
   College Level: Yes
   Flesch-Kincaid reading level: 12
7. Entrance Skills: *Before entering the course students must be able:*
   a.
   State and explain the fundamental laws and concepts of physics in the areas of mechanics, thermodynamics, fluids, sound and wave motion.
   - PH 002A - State and explain the fundamental laws and concepts of physics in the areas of mechanics, fluids, thermodynamics, sound and wave motion.

   b. Demonstrate an awareness of how physics has shaped history and how it will shape the future.
   - PH 002A - Demonstrate an awareness of how physics has shaped history and how it will shape the future.

   c.
   Demonstrate the ability to prepare and analyze laboratory experiments using scientific methods in the areas of mechanics, thermodynamics, fluids, sound and wave motion.

- PH 002A - Demonstrate the ability to prepare and analyze laboratory experiments using scientific methods in the areas of mechanics, fluids, thermodynamics, sound and wave motion.

d.
Utilize good problem solving techniques in the areas of mechanics, thermodynamics, fluids, sound and wave motion.

- PH 002A - Utilize good problem solving techniques in the areas of mechanics, fluids, thermodynamics, sound and wave motion.

e.
Solve the standard physics problems appropriate for this course in the areas of mechanics, thermodynamics, fluids, sound and wave motion.

- PH 002A - Solve the standard physics problems appropriate for this course in the areas of mechanics, fluids, thermodynamics, sound and wave motion.

f.
Use and explain the mathematical techniques and concepts used in this course in the areas of mechanics, thermodynamics, fluids, sound and wave motion.

- PH 002A - Use and explain the mathematical techniques and concepts used in this course in the areas of mechanics, fluids, thermodynamics, sound and wave motion.

g.
Apply these techniques on real world science and engineering problems in the areas of mechanics, thermodynamics, fluids, sound and wave motion.

- PH 002A - Apply these techniques on real world science and engineering problems in the areas of mechanics, fluids, thermodynamics, sound and wave motion.

h.
Demonstrate an understanding of basic vector analysis in the areas of mechanics, thermodynamics, fluids, sound and wave motion.

- PH 002A - Demonstrate an understanding of basic vector analysis in the areas of mechanics, fluids, thermodynamics, sound and wave motion.

8. Course Content and Scope:

Lecture:

1. Charge, Electric Forces and Coulombs' Law, Gauss' Law and Electric Fields
2. Electric Potential and Capacitors
3. Circuits, Ohms Law, Kirchoffs Laws
4. Magnetic forces and Fields
5. Electromagnetic Induction
6. Electromagnetic Waves
7. Reflection and Mirrors
8. Refraction, lenses and optical instruments
9. Selected topics in modern physics from the following list: Relativity, Quantum Theory, Atomic, and Nuclear Physics

Lab: *(if the "Lab Hours" is greater than zero this is required)*

1. Charge, Electric Forces and Coulombs' Law, Gauss' Law and Electric Fields
2. Electric Potential and Capacitors
3. Circuits, Ohms Law, Kirchoffs Laws
4. Magnetic forces and Fields
5. Electromagnetic Induction
6. Electromagnetic Waves

7. Reflection and Mirrors
8. Refraction, lenses and optical instruments

9. Course Student Learning Outcomes:
   1. Describe the fundamental concepts and behavior of electricity and magnetism and the interrelation between the two.
   2. Analyze the characteristics and behavior of simple circuits.
   3. Perform laboratory experiments safely and correctly.

10. Course Objectives: *Upon completion of this course, students will be able to:*
    a. State and explain the fundamental laws and concepts of physics in the areas of electricity, magnetism, optics, and selected topics in modern physics.
    b. Demonstrate an awareness of how physics has shaped the history of man and how it will shape his/her future.
    c. Demonstrate the ability to prepare and analyze laboratory experiments using scientific methods in the areas of electricity, magnetism, optics, and selected topics in modern physics.
    d. Utilize good problem solving techniques in the areas of electricity, magnetism, optics, and selected topics in modern physics.
    e. Solve the standard physics problems appropriate for this course in the areas of electricity, magnetism, optics, and selected topics in modern physics.
    f. Use and explain the mathematical techniques and concepts used in this course in the areas of electricity, magnetism, optics, and selected topics in modern physics.
    g. Apply these techniques on real world science and engineering problems in the areas of electricity, magnetism, optics, and selected topics in modern physics.
    h. Demonstrate an understanding of basic vector analysis in the areas of electricity, magnetism, optics, and selected topics in modern physics.

11. Methods of Instruction: *(Integration: Elements should validate parallel course outline elements)*
    a. Demonstration, Repetition/Practice
    b. Discussion
    c. Laboratory
    d. Lecture

12. Assignments: *(List samples of specific activities/assignments students are expected to complete both in and outside of class.)*
    In Class Hours: 108.00
    Outside Class Hours: 108.00
    a. In-class Assignments
       -
    b. Out-of-class Assignments
       1. Reading (text, study guides)
       2. Homework (problems involving analyzing physical systems, calculations, graphing, formula derivations; conceptual questions testing comprehension of material)
       3. Submit completed weekly supervised laboratory assignments.
       4. Maintain a comprehensive laboratory notebook documenting all lab course work.

13. Methods of Evaluating Student Progress: *The student will demonstrate proficiency by:*
    - Laboratory projects
    - Computational/problem solving evaluations
    - Mid-term and final evaluations

14. Methods of Evaluating: Additional Assesment Information:

a. Several periodic examinations on subject material. These examinations will all be essay; practical parts and short answer. b. A comprehensive final on all course material. c. Laboratory examinations will be given where students individually demonstrate their hands-on understanding of course material. d. Laboratory notebooks will be examined for completeness and correctness.

15. Need/Purpose/Rationale -- *All courses must meet one or more CCC missions.*

IGETC Area 5: Physical and Biological Sciences (mark all that apply)

A: Physical Science with Lab

CSU GE Area B: Physical and its Life Forms(mark all that apply)

B1 - Physical Science

B3 - Laboratory Sciences

PO-GE C1-Natural Sciences

Explain concepts and theories related to physical, chemical, and biological natural phenomena.

Draw a connection between natural sciences and their own lives.

Use college-level mathematical concepts and methods to understand, analyze, and explain issues in quantitative terms.

IO - Scientific Inquiry

Identify components of the scientific method.

Collect and analyze data. Skills of data collection include an understanding of the notion of hypothesis testing and specific methods of inquiry such as experimentation and systematic observation.

Predict outcomes utilizing scientific inquiry: using evidence and assertions determine which conclusions logically follow from a body of quantitative and qualitative data.

Analyze quantitative and qualitative information to make decisions, judgments, and pose questions.

Recognize the utility of the scientific method and its application to real life situations and natural phenomena.

IO - Critical Thinking and Communication

Apply principles of logic to problem solve and reason with a fair and open mind.

16. Comparable Transfer Course

University System	Campus	Course Number	Course Title	Catalog Year
CSU	CSU San Bernardino	Physics-122	Basic Concepts of Physics	2008-2009

17. Special Materials and/or Equipment Required of Students:

18. Materials Fees: ☐ Required Material?

Material or Item	Cost Per Unit	Total Cost

19. Provide Reasons for the Substantial Modifications or New Course:

C-ID Alignment

20. a. Cross-Listed Course *(Enter Course Code)*: *N/A*
    b. Replacement Course *(Enter original Course Code)*: *N/A*

21. Grading Method *(choose one)*: Letter Grade Only

22. MIS Course Data Elements
    a. Course Control Number [CB00]: CCC000122201
    b. T.O.P. Code [CB03]: 190200.00 - Physics, General
    c. Credit Status [CB04]: D - Credit - Degree Applicable
    d. Course Transfer Status [CB05]: A = Transfer to UC, CSU
    e. Basic Skills Status [CB08]: 2N = Not basic skills course

f. Vocational Status [CB09]: Not Occupational
g. Course Classification [CB11]: Y - Credit Course
h. Special Class Status [CB13]: N - Not Special
i. Course CAN Code [CB14]: *N/A*
j. Course Prior to College Level [CB21]: Y = Not Applicable
k. Course Noncredit Category [CB22]: Y - Not Applicable
l. Funding Agency Category [CB23]: Y = Not Applicable
m. Program Status [CB24]: 1 = Program Applicable

Name of Approved Program *(if program-applicable)*: *N/A*
Attach listings of Degree and/or Certificate Programs showing this course as a required or a restricted elective.)

23. Enrollment - Estimate Enrollment
First Year: 0
Third Year: 0

24. Resources - Faculty - Discipline and Other Qualifications:
a. Sufficient Faculty Resources: Yes
b. If No, list number of FTE needed to offer this course: *N/A*

25. Additional Equipment and/or Supplies Needed and Source of Funding.
N/A

26. Additional Construction or Modification of Existing Classroom Space Needed. *(Explain:)*
N/A

27. FOR NEW OR SUBSTANTIALLY MODIFIED COURSES
Library and/or Learning Resources Present in the Collection are Sufficient to Meet the Need of the Students Enrolled in the Course: Yes

28. Originator Doug MacIntire Origination Date 05/19/14