

LAST REVIEW: 2010-2011 **NEXT REVIEW:** 2015-2016 **STATUS:** A
(i.e. 2006-2007) *(i.e. 2011-2012)* *(A, I, D)*

COURSE TITLE: Applied Physics

COMMON COURSE NUMBER: PHY 1001

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(Per 16 week term)

CLOCK HOURS:

(Voc. Course ONLY)

Lecture: **48** Lab:

Clinic: Other:

PREREQUISITE(S): MAT 1033

COREQUISITE(S):

PRE/COREQUISITE(S):

COURSE DESCRIPTION *(750 characters, maximum):*

PHY 1001 is an introductory course in general physics outlining topics in mechanics, matter, magnetism, electricity, heat and wave phenomena. The course is intended for students in technical or vocational fields. The student will learn to analyze and solve problems using analysis in algebra and written composition projects.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s): 4B Area
General Education Requirements – Associate in Science Degree (AS), meets Area(s): 4 Area
General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s): 4 Area

UNIT TITLES

- 1. Measurement and Vectors and Problem Solving**
- 2. Mechanics**
- 3. Matter**
- 4. Heat**
- 5. Electricity and Magnetism**
- 6. Waves**

*** Complete the following only if course is seeking general education status ***

GENERAL EDUCATION Competencies and Skills *:

In the box to the right of the Competency/Skill, enter all specific **student learning outcome** unit numbers, as indicated in the course outline (i.e. 1.1, 2.7, 4.2, 4.0 and 5.12) that apply.

Course must include <u>all</u> of the following:	
1. Read with critical comprehension**	1.2
2. Write clearly and coherently**	1.3
3. Demonstrate literacy as appropriate within a given discipline**	F: 2.0, 3.0, 4.0, 5.0, 6.0
4. Apply problem solving skills or methods to make informed decisions in a variety of contexts**	2.2, 2.3, 3.2, 4.3, 5.1, 5.3, 6.2
Course must include at least <u>one</u> of the following:	
5. Differentiate between ethical and unethical behavior	
6. Demonstrate an understanding of the physical, biological, and social environments and how individual behaviors impact this complex system.	2.2, 2.6, 4.2, 5.2
7. Demonstrate an understanding of and appreciation for human diversities and commonalities.	
8. Speak and listen effectively.	

**General Education Competencies and Skills endorsed by 2010-2011 General Education Task Force*

****Required Competencies**

1) Read with critical comprehension.

The student will be introduced to the basic texts, concepts, vocabulary, and methods necessary for developing an understanding of the discipline and meeting the required benchmarks as stated in the course outline.

2) Write clearly and coherently.

The student will demonstrate an understanding and mastery of subject matter in a variety of ways, including writing. Writing activities may include both graded and ungraded essays, short answer quizzes, summaries, reactions, journals, and various other reports.

3) Demonstrate and apply literacy across all the disciplines (indicate which ones apply).

- a) **Information literacy** means understanding how to locate needed information, using the appropriate technology for the task, managing and evaluating the extracted information and using it effectively and ethically.
- b) **Technology literacy** is the ability to responsibly and effectively use appropriate technology to access, manage, integrate, or create information, and/or use technology to accomplish a given task.
- c) **Workplace literacy** is having the appropriate knowledge and skills to communicate and work with others effectively and perform job duties, whether it is through the use of computers and/or other technology.
- d) **Cultural literacy** is recognizing, understanding, and appreciating the similarities and differences between one's own culture and the cultures of others through a study of the arts, customs, beliefs, values, and history that define a culture.
- e) **Quantitative literacy** is having the ability to formulate, solve and interpret mathematical/statistical operations and graphical/tabular representations to make informed decisions.
- f) **Scientific literacy** means understanding the methodology and application of the scientific process, the physical and biological worlds, and recognizing that scientific knowledge is continuously updated or revised as new information is discovered.

g) Environmental literacy is creating a context within which environmental issues can be viewed, imparting knowledge to enhance one's ability to analyze the issues, make the connections between humans' decisions and actions and the challenges facing the environment, and instilling the desire to sustain the environment through ethical practices in both one's professional and personal lives.

4. Apply problem-solving skills or methods to make informed decisions in a variety of contexts.

The student will use acquired skills or methods to recognize, analyze, adapt, and apply critical thinking to solve problems and make informed decisions.

EVALUATION:

In the box to the right of the Methods of Assessment, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 4.0, 4.2 and 5.12) that apply.

1. Portfolio	
2. Short essays	
3. Research Papers	2.2, 2.6, 4.2, 5.2
4. Group projects	
5. Discussions (In class and online)	
6. Multiple Choice tests	
7. Presentations	
8. Service Learning Projects	
9. Quizzes (pop, announced, etc.)	1.0, 2.0, 3.0, 4.0, 5.0
10. Take-home tests	1.0, 2.0, 3.0, 4.0, 5.0
11. Summaries, critiques, and analyses	
12. Reaction papers	
13. Surveys	
14. Performance	
15. Short answer tests	2.2, 2.6, 4.2, 5.2
16. Classroom debates and colloquia	
17. Blogs, wikis, web pages	
18. Other (Please explain)	

UNITS

Unit 1 Measurement and Vectors and Problem Solving

General Outcome:

- 1.0 The student shall:** be able to analyze measurement systems, dimensional analysis, and vector operations. The student should be able to read and evaluate readings and problems in clearly written compositions.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 1.1** Manage measurement systems and evaluate an answer based on dimensional analysis.
- 1.2** Select the relevant data and equations in scientific readings and problems to evaluate the concepts presented in physics.
- 1.3** Present solutions and evaluations of readings and word problems using the standard formats in physics.
- 1.4** Differentiate between scalar and vector quantities in Cartesian and non-Cartesian coordinates and be able to manipulate them algebraically.

Unit 2 Mechanics

General Outcome:

- 2.0** The students shall be able to apply problem solving techniques to a variety of physical phenomena involving the motion of objects to evaluate and propose behavioral patterns.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

- 2.1** Use different systems of measurement.
- 2.2** Illustrate and interpret the use of Newton's Laws of Motion.
- 2.3** Compose and solve kinematic equations of motion.
- 2.4** Examine the uses of the Law of Conservation of Momentum.
- 2.5** Examine the uses of the Law of Conservation of Energy.
- 2.6** Distinguish and differentiate between work, energy and power.

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Unit 3 Matter

General Outcome:

- 3.0** The students shall be able to apply problem solving techniques to a variety of physical phenomena involving the different phases of matter.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

- 3.1 Categorize the properties of the different phases of matter.
- 3.2 Demonstrate the use of density measurements.
- 3.3 Differentiate and interpret the principles of fluid dynamics.

Common Course Number: PHY 1001

Unit 4 Heat

General Outcome:

- 4.0** The students shall be able to apply problem solving techniques to a variety of physical phenomena involving Heat.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

- 4.1** Distinguish between heat and temperature.
- 4.2** Debate the pros and cons of different temperature scales.
- 4.3** Apply the Conservation of Energy to thermal systems.

Common Course Number: PHY 1001

Unit 5 Electricity and Magnetism

General Outcome:

- 5.0** The students shall be able to apply problem solving techniques to a variety of physical phenomena involving electricity and magnetism.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

- 5.1** Apply methods of solutions for forces in systems of electric and magnetic charges.
- 5.2** Categorize the properties of electricity and magnetism in different materials.
- 5.3** Solve word problems by applying Ohm's Law and the Power Law to simple dc circuits.

Common Course Number: PHY 1001

Unit 6 Waves

General Outcome:

- 6.0** The students shall be able to apply problem solving techniques to a variety of physical phenomena involving wave theory.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the students shall be able to:

- 6.1 Distinguish between the properties of longitudinal and transverse waves.
- 6.2 Analyze and solve problems involving wave motion and energy.
- 6.3 Construct ray diagrams of light involving reflection and refraction.
- 6.4 Differentiate between real and virtual images.