

# North Hennepin Community College

## PHYS 1231: Principles of Physics I

### A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 3

Lab Hours/Week: 2

OJT Hours/Week: \*.\*

Prerequisites:

This course requires any of these four prerequisites

Placement into MATH 1170 or MATH 1200

Placement into MATH 1221

MATH 1150 - College Algebra (Minimum grade: 1.67 GPA Equivalent)

MATH 1180 - College Algebra and Pre-Calculus (Minimum grade: 1.67 GPA Equivalent)

Corequisites: None

MnTC Goals: Goal 03 - Natural Science

An algebra-based course for students needing a fuller introduction to physics than would be found in a general education/survey course. Topics include straight-line and circular motion, Newtons Laws, torque & static equilibrium, conservation of energy, fluids, thermal physics & thermodynamics, periodic motion. Optional topics are free energy. Applications will be drawn from several areas, including (but not limited to) those appropriate to the biological/medical/health career fields. Concepts of right-triangle trigonometry will be introduced as needed.(3 hours lecture, 2 hours lab). Prerequisite: Completion of either MATH 1150 or MATH 1180 with a C or better OR eligibility for either MATH 1170 or MATH 1221 through College math placement score OR consent of the instructor.

**B. COURSE EFFECTIVE DATES:** 03/11/2019 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Knowledge of Human Cultures and the Physical and Natural World - Through study in the sciences, mathematics, social sciences, humanities, histories, languages, the arts, technology and professions.
2. Intellectual and Practical Skills - Including: Inquiry and analysis; Written Communication, Oral communication; Quantitative literacy; Information literacy.
3. Integrative and Applied Learning - Synthesis and advanced accomplishment across general education, liberal studies, specialized studies and activities in the broader campus community. Including: Problem solving; Global learning; Creative thinking; Critical thinking; Integrative Learning.

#### **D. LEARNING OUTCOMES (General)**

1. Define physics and physics-related terms, laws, and theories (MnTC Goal 3a; ELO 1)
2. Identify the physical principles and laws that apply in a given physical event or situation. (MnTC Goal 3a; ELO 1)
3. Describe and explain in conceptual terms what and how is taking place in various physical processes or events, and to make qualitative predictions about the outcome of these processes/events. (MnTC Goal 3a; ELO 1, 2)
4. Examine a physical situation quantitatively and make a numerical prediction, through problem-solving and applied mathematics, about the result or outcome of the situation. (MnTC Goal 3a; ELO 1, 2)
5. Collect data, perform statistical and graphical analysis on this data, and appreciate sources of error and uncertainty. (MnTC Goal 3b; ELO 2)
6. Communicate experimental findings, analyses, and interpretations both orally and in writing. (MnTC Goal 3c; ELO 2)
7. Integrate new skills into customary ways of thinking while developing organized problem-solving skills.(MnTC Goal 3a; ELO 2, 4)
8. Utilize multiple physics topics and principles in problem-solving. (MnTC Goal 3a; ELO 1, 2, 4)

#### **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.

#### **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

#### **G. SPECIAL INFORMATION**

None noted