Faculty members are required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Academic Affairs and Standards Council.

DEPT. PHYS

COURSE NUMBER: 2121

NUMBER OF CREDITS: 5
Lecture: 4
Lab: 1

Course Title:
General Physics I

Catalog Description:
General Physics I teaches the fundamentals of physics using calculus and vectors. Uses laboratory centered instruction with calculator and computer based investigations. Topics include kinematics, Newton's Laws of motion, forces, collisions, momentum, work, and energy, energy conservation, rotational motion, angular momentum, torque, harmonic motion, oscillations, and fluids. Prerequisite: MATH 1121 (can be taken concurrently).

FULFILLS MN TRANSFER CURRICULUM AREA(S) (Leave blank if not applicable)
Goal 1: Communication: ____ by meeting the following competencies:

Goal 2: Critical Thinking: ____ by meeting the following competencies:

Goal 3: Natural Sciences: X by meeting the following competencies:
- Demonstrate understanding of scientific theories.
- 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.
- Communicate their experimental findings, analyses, and interpretations both orally and in writing.
- Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

Goal 4: Mathematics/Logical Reasoning: ____ by meeting the following competencies:

Goal 5: History and the Social and Behavioral Sciences: ____ by meeting the following competencies:

Goal 6: The Humanities and Fine Arts: ____ by meeting the following competencies:
Goal 7: Human Diversity: ____ by meeting the following competencies:

Goal 8: Global Perspective: ____ by meeting the following competencies:

Goal 9: Ethical and Civic Responsibility: ____ by meeting the following competencies:

Goal 10: People and the Environment: ____ by meeting the following competencies:

**Prerequisites or Necessary Entry Skills/Knowledge:**
Prerequisite: MATH 1121 (can be taken concurrently).

**Topics to be Covered (General)**
- Physics and measurement
- Motion in one dimension – speed, velocity, acceleration
- Gravity and projectile motion
- Newton’s Laws and their applications
- Work-Energy Theorem – Potential and kinetic energy
- Conservation of energy
- Momentum and its conservation – collisions, impulse
- Rotational motion, inertia, angular momentum, and torque
- Oscillations, harmonic motion, and sound
- Fluids and pressure

**Student Learning Outcomes**
- Define physics concepts and their applications.
- Model physical behavior by performing hands-on activities and experiments.
- Develop problem solving techniques using mathematical models describing physical concepts.
- Analyze and interpret data collected in a variety of methods.
- Describe and interpret physical properties in action with real-world situations encountered in their everyday environment.

See SAMPLE EXPECTED LEARNING OUTCOMES STATEMENTS and ACTION VERB LIST FOR COURSE OUTCOMES in the Minnesota West Curriculum Development Manual which can be accessed at [https://www.mnwest.edu/faculty-resources/curriculum-manual](https://www.mnwest.edu/faculty-resources/curriculum-manual)

**Is this course part of a transfer pathway:** Yes [ ] No [X]

*If yes, please list the competencies below*