DEPT. ___PHYS___ COURSE NUMBER: ___2122___

NUMBER OF CREDITS: ___5____ Lecture: ___4___ Lab: ___1___

Course Title:
General Physics II

Catalog Description:
General Physics II continues Physics 2121. Calculus and vectors are used throughout. Uses laboratory-based instruction. Topics include heat and thermodynamics, heat engines, electric charges and forces, electric potential, electric fields, Gauss’ Law, direct and alternating current circuits, capacitors and RC circuits, electronics, magnetism and magnetic fields, modern physics, and radioactivity. Prerequisite: PHYS 2121 and MATH 1121, with MATH 1122 being taken concurrently or before.

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: PHYS 2121 and MATH 1121, with MATH 1122 being taken concurrently or before.

**Topics to be Covered (General)**
- Introduction to Heat and Temperature (Optional)
- Heat Energy Transfer (Optional)
- Phase and Phase Changes (Optional)
- The Laws of Thermodynamics (Optional)
- The Ideal Gas Law (Optional)
- Heat Engines (Optional)
- Electric Charges, Forces, and Fields
- Electric Potential and Electric Potential Energy
- Electric Current and Direct Current Circuits, Kirchhoff's Circuits Rules
- Magnetism
- Magnetic Flux and Faraday's Law of Induction
- Alternating-Current Circuits
- Electromagnetic Waves
- Geometrical Optics
- Optical Instruments
- Interference and Diffraction
- Introduction to Quantum Physics and Atomic Physics
- Nuclear Physics and Nuclear Radiation

**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
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<th>Is this course part of a transfer pathway:</th>
<th>Yes</th>
<th>No</th>
<th>X</th>
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<td>*If yes, please list the competencies below</td>
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Revised 11/19