Course Outcome Summary

General Education Satisfier Course

PHY 251 Engineering Physics I

Course Information
Division: Science/Mathematics
Contact Hours: 105
Lecture Hours: 60
Lab Hours: 45
Total Credits: 5

Prerequisites
MATH 171, Recommended: MATH 172.

Course Description
This course is designed to satisfy the requirements of Engineering and Physics majors. Development of ability to marshal physical principles and mathematical techniques in the solution of problems encountered in classical mechanics -including linear and rotational motion, energy, momentum, gravitation, fluids- relativity and wave motion. Calculus based.

This course is approved as a General Education competency satisfier.

General Education Goal: Goal One: Critical Thinking
Competency: Understand and apply the elements of scientific inquiry and scientific principles in a natural science college laboratory course setting
Learning Outcome: Students will use the scientific method to define a problem, utilize appropriate methods to solve the problem, and propose and evaluate a solution to the problem.

General Education Learning Objectives
A. Observe and describe natural phenomena and formulate hypotheses.
B. Plan and implement scientific experiments to test hypotheses.
C. Utilize scientific laboratory skills for data collection within a college laboratory setting.
D. Evaluate experimental data and propose solutions based on this data.
E. Evaluate the proposed implications of a solution.

Course Outcomes
In order to evidence success in this course, the students will be able to:

1. Utilize units of measurement in the SI system, prefixes, unit conversions and data analysis, including propagation of errors.
   Applies to General Education Objective
   D. Evaluate experimental data and propose solutions based on this data.

2. Identify parameters and laws in both linear and rotational motion
   Applies to General Education Objective
   A. Observe and describe natural phenomena and formulate hypotheses.
   B. Plan and implement scientific experiments to test hypotheses.
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3. Describe Newton's laws and the law of Universal Gravitation

   Applies to General Education Objective
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   E. Evaluate the proposed implications of a solution.

4. Distinguish between work and the different types of mechanical energy

   Applies to General Education Objective
   A. Observe and describe natural phenomena and formulate hypotheses.
   B. Plan and implement scientific experiments to test hypotheses.
   C. Utilize scientific laboratory skills for data collection within a college laboratory setting.
   D. Evaluate experimental data and propose solutions based on this data.
   E. Evaluate the proposed implications of a solution.

5. Analyze momentum and impulse in collisions

   Applies to General Education Objective
   A. Observe and describe natural phenomena and formulate hypotheses.
   B. Plan and implement scientific experiments to test hypotheses.
   C. Utilize scientific laboratory skills for data collection within a college laboratory setting.
   D. Evaluate experimental data and propose solutions based on this data.
   E. Evaluate the proposed implications of a solution.

6. Identify parameters and properties of waves including sound.

   Applies to General Education Objective
   A. Observe and describe natural phenomena and formulate hypotheses.
   B. Plan and implement scientific experiments to test hypotheses.
   C. Utilize scientific laboratory skills for data collection within a college laboratory setting.
   D. Evaluate experimental data and propose solutions based on this data.
   E. Evaluate the proposed implications of a solution.

7. Contrast the concepts of relative speed, momentum and energy in classical physics with those in special relativity

   Applies to General Education Objective
   A. Observe and describe natural phenomena and formulate hypotheses.
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   C. Utilize scientific laboratory skills for data collection within a college laboratory setting.
   D. Evaluate experimental data and propose solutions based on this data.
   E. Evaluate the proposed implications of a solution.

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