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 measurement, mechanics, relativity, rotational and wave motion, waves, sound, and fluid mechanics.

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. Describe and define measurements in the SI, US customary, and cgs systems.
   Applies to General Education Objective
   D. Evaluate experimental data and propose solutions based on this data.

2. Identify the four kinematic equations of motion.
   Applies to General Education Objective
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3. Solve for each variable in the kinematic equations.
   **Applies to General Education Objective**
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   B. Plan and implement scientific experiments to test hypotheses.
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4. Describe the relationship between horizontal and vertical motion.
   **Applies to General Education Objective**
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   B. Plan and implement scientific experiments to test hypotheses.
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5. Compute products and sums of vectors.
   **Applies to General Education Objective**
   D. Evaluate experimental data and propose solutions based on this data.

   **Applies to General Education Objective**
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7. Solve for each variable in Newton's dynamic equations.
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   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.

8. Describe work in a scientific way.
   **Applies to General Education Objective**
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   B. Plan and implement scientific experiments to test hypotheses.
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9. Calculate the amount work done over a given distance and angle.
   **Applies to General Education Objective**
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   B. Plan and implement scientific experiments to test hypotheses.
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   E. Evaluate the proposed implications of a solution.
10. Compare rotational and linear motion.

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11. State the conditions for static and kinetic friction.

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12. Identify terms used in both momentum and impulse.

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13. Calculate momentum and impulse.

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14. Describe the equation differences used for relative speed, momentum, and energy for relativistic affects.

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15. Define the condition(s) necessary for simple harmonic motion.

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 E. Evaluate the proposed implications of a solution.
16. Identify longitudinal and transverse waves.
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   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.

17. Determine wavelengths, frequencies, and periods in wave motion.
   *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.

18. Define the conditions necessary to produce standing waves in strings, open-closed systems, and closed-closed systems.
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   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.

19. Identify static and dynamic pressure situations.
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