WTCS Repository

10-806-154 General Physics 1

Course Outcome Summary

Course Information

Description
Presents the applications and theory of basic physics principles. This course emphasizes problem-solving, laboratory investigation, and applications. Topics include unit conversion and analysis, vectors, translational and rotational kinematics, translational and rotational dynamics, heat and temperature, and harmonic motion and waves.

Total Credits 4.00

Pre/Corequisites

Prerequisite Each Wisconsin Technical College determines the General Education course prerequisites used by their academic institution. If prerequisites for a course are determined to be appropriate, the final Course Outcome Summary must identify the prerequisites approved for use by the individual Technical College.

Course Competencies

1. Solve problems involving unit conversion and unit analysis.
   Assessment Strategies
   1.1. with the use of a scientific calculator.
   1.2. through completion of homework.
   1.3. through completion of quizzes/exams.
   1.4. through completion of lab activities.

   Criteria
   Your performance will be successful when:
   1.1. you use the conversion factor method to make correct conversions.
   1.2. you show the steps used to solve the problem.
   1.3. you include correct units of measure in your answer.

2. Perform vector analysis.
   Assessment Strategies
   2.1. with the use of a scientific calculator.
   2.2. through completion of homework.
   2.3. through completion of quizzes/exams.
   2.4. through completion of lab activities.

   Criteria
   Your performance will be successful when:
   2.1. you successfully add and subtract vectors using component method.
   2.2. you successfully convert between rectangular and polar form.
   2.3. you show the steps used to solve the problem.
   2.4. you include correct units of measure in your answer.
3. **Apply the laws of translational kinematics.**

Assessment Strategies
3.1. with the use of a scientific calculator.
3.2. through completion of homework.
3.3. through completion of quizzes/exams.
3.4. through completion of lab activities.

Criteria

*Your performance will be successful when:*
3.1. you correctly solve problems involving displacement, velocity, acceleration, and time.
3.2. you show the steps used to solve the problem.
3.3. you include correct units of measure in your answer.

4. **Apply the laws of translational dynamics.**

Assessment Strategies
4.1. with the use of a scientific calculator.
4.2. through completion of homework.
4.3. through completion of quizzes/exams.
4.4. through completion of lab activities.

Criteria

*Your performance will be successful when:*
4.1. you draw an accurate freebody or motion diagram representing the problem.
4.2. you use the freebody diagram to solve for unknowns.
4.3. you correctly solve uniform circular motion problems.
4.4. you show the steps used to solve the problem.
4.5. you include correct units of measure in your answer.

5. **Solve problems using concepts of work, energy, and power.**

Assessment Strategies
5.1. with the use of a scientific calculator.
5.2. through completion of homework.
5.3. through completion of quizzes/exams.
5.4. through completion of lab activities.

Criteria

*Your performance will be successful when:*
5.1. you accurately calculate work.
5.2. you accurately calculate power.
5.3. you accurately calculate kinetic energy.
5.4. you accurately calculate potential energy.
5.5. you correctly solve problems using the law of conservation of energy.
5.6. you show the steps used to solve the problem.
5.7. you include correct units of measure in your answer.

6. **Solve problems based on the principle of conservation of momentum.**

Assessment Strategies
6.1. with the use of a scientific calculator.
6.2. through completion of homework.
6.3. through completion of quizzes/exams.
6.4. through completion of lab activities.

Criteria

*Your performance will be successful when:*
6.1. you accurately calculate momentum.
6.2. you correctly solve problems using the law of conservation of momentum.
6.3. you show the steps used to solve the problem.
6.4. you include correct units of measure in your answer.

7. **Apply the laws of rotational kinematics.**

**Assessment Strategies**
- 7.1. with the use of a scientific calculator.
- 7.2. through completion of homework.
- 7.3. through completion of quizzes/exams.
- 7.4. through completion of lab activities.

**Criteria**

*Your performance will be successful when:*
- 7.1. you correctly solve problems involving angular displacement, angular velocity, angular acceleration, and time.
- 7.2. you show the steps used to solve the problem.
- 7.3. you include correct units of measure in your answer.

8. **Apply the laws of rotational dynamics.**

**Assessment Strategies**
- 8.1. with the use of a scientific calculator.
- 8.2. through completion of homework.
- 8.3. through completion of quizzes/exams.
- 8.4. through completion of lab activities.

**Criteria**

*Your performance will be successful when:*
- 8.1. you draw an accurate freebody or motion diagram representing the problem.
- 8.2. you use the freebody diagram to solve for unknowns.
- 8.3. you accurately calculate moment of inertia.
- 8.4. you accurately calculate rotational kinetic energy.
- 8.5. you accurately calculate work.
- 8.6. you accurately calculate power.
- 8.7. you correctly solve problems using the law of conservation of energy.
- 8.8. you show the steps used to solve the problem.
- 8.9. you include correct units of measure in your answer.

9. **Solve problems involving properties of solids and fluids.**

**Assessment Strategies**
- 9.1. with the use of a scientific calculator.
- 9.2. through completion of homework.
- 9.3. through completion of quizzes/exams.
- 9.4. through completion of lab activities.

**Criteria**

*Your performance will be successful when:*
- 9.1. you accurately calculate pressure.
- 9.2. you correctly apply Archimedes’ Principle.
- 9.3. you correctly solve problems in fluid dynamics.
- 9.4. you correctly solve problems involving the deformation of solids.

10. **Solve problems involving heat and temperature.**

**Assessment Strategies**
- 10.1. with the use of a scientific calculator.
- 10.2. through completion of homework.
- 10.3. through completion of quizzes/exams.
- 10.4. through completion of lab activities.
Criteria

Your performance will be successful when:

10.1. you accurately complete temperature conversion problems.
10.2. you accurately solve problems related to specific heat and latent heat.
10.3. you accurately solve problems related to heat transfer.
10.4. you accurately solve problems related to the gas laws.
10.5. you accurately solve problems related to thermal expansion.
10.6. you solve problems involving the First Law of Thermodynamics.

11. Solve problems involving simple harmonic motion and waves.

Assessment Strategies

11.1. with the use of a scientific calculator.
11.2. through completion of homework.
11.3. through completion of quizzes/exams.
11.4. through completion of lab activities.

Criteria

Your performance will be successful when:

11.1. you accurately solve problems related to simple harmonic motion.
11.2. you accurately solve problems involving frequency, amplitude, wavelengths, and wave speed.
11.3. you describe interference and resonance.
11.4. you correctly solve problems involving sound intensity levels.
11.5. you correctly solve problems using the doppler effect.