

10-806-154 General Physics 1

# Course Outcome Summary

### Course Information

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|  | Description | Presents the applications and theory of basic physics principles. This course emphasizes problem-solving, laboratory investigation, and applications. Topics include unit conversion, vector analysis, kinematics and dynamics of particles, rotational mechanics, fluids, heat and temperature, and harmonic motion and waves. |
|  | Total Credits | 4 |

Pre/Corequisites

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| 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

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| 1. | Solve problems involving dimensional unit analysis | |
|  | Assessment Strategies | |
|  | 1.1. | Homework, quizzes, exams, and/or lab activities |
|  | Criteria | |
|  | 1.1. | use the conversion factor |
|  | 1.2. | analyze solutions using dimensional analysis |
|  | 1.3. | show the steps used to solve the problem |
|  | 1.4. | include correct units of measure in your answer |
| 2. | Perform vector analysis | |
|  | Assessment Strategies | |
|  | 2.1. | Homework, quizzes, exams, and/or lab activities |
|  | Criteria | |
|  | 2.1. | add and subtract vectors using component method |
|  | 2.2. | analyze vector problems in rectangular and polar form |
|  | 2.3. | show the steps used to solve the problem |
|  | 2.4. | include correct units of measure in your answer |
| 3. | Apply the laws of particle kinematics | |
|  | Assessment Strategies | |
|  | 3.1. | Homework, quizzes, exams, and/or lab activities |
|  | Criteria | |
|  | 3.1. | solve problems involving displacement, velocity, acceleration, and time in one- and two-dimensions |
|  | 3.2. | interpret motion in one- and two-dimensions using diagrams or graphs |
|  | 3.3. | show the steps used to solve the problem |
|  | 3.4. | include correct units of measure in your answer |
| 4. | Apply the laws of particle dynamics | |
|  | Assessment Strategies | |
|  | 4.1. | Homework, quizzes, exams, and/or lab activities |
|  | Criteria | |
|  | 4.1. | apply Newton’s laws to physical systems in one- and two-dimensions |
|  | 4.2. | draw a freebody or motion diagram representing the problem |
|  | 4.3. | use the freebody diagram to solve for unknowns |
|  | 4.4. | solve uniform circular motion problems |
|  | 4.5. | show the steps used to solve the problem |
|  | 4.6. | include correct units of measure in your answer |
| 5. | Solve problems using concepts of work, energy, and power | |
|  | Assessment Strategies | |
|  | 5.1. | Homework, quizzes, exams, and/or lab activities |
|  | Criteria | |
|  | 5.1. | calculate work, kinetic energy, potential energy, and power |
|  | 5.2. | apply the law of conservation of energy |
|  | 5.3. | apply the work energy theorem |
|  | 5.4. | show the steps used to solve the problem |
|  | 5.5. | include correct units of measure in your answer |
| 6. | Solve problems based on concepts of impulse and momentum | |
|  | Assessment Strategies | |
|  | 6.1. | Homework, quizzes, exams, and/or lab activities |
|  | Criteria | |
|  | 6.1. | calculate momentum and impulse |
|  | 6.2. | apply the law of conservation of momentum |
|  | 6.3. | apply the impulse-momentum theorem |
|  | 6.4. | show the steps used to solve the problem |
|  | 6.5. | include correct units of measure in your answer |
| 7. | Apply the laws of rotational mechanics | |
|  | Assessment Strategies | |
|  | 7.1. | Homework, quizzes, exams, and/or lab activities |
|  | Criteria | |
|  | 7.1. | solve problems involving angular displacement, angular velocity, angular acceleration, and time |
|  | 7.2. | draw a freebody or motion diagram representing the problem |
|  | 7.3. | use the freebody diagram to solve for unknowns |
|  | 7.4. | apply the principle of static equilibrium |
|  | 7.5. | calculate moment of inertia |
|  | 7.6. | calculate rotational energy, work, and power |
|  | 7.7. | apply the conservation laws to rotation |
|  | 7.8. | show the steps used to solve the problem |
|  | 7.9. | include correct units of measure in your answer |
| 8. | Solve problems involving properties of fluids | |
|  | Assessment Strategies | |
|  | 8.1. | Homework, quizzes, exams, and/or lab activities |
|  | Criteria | |
|  | 8.1. | calculate density and pressure |
|  | 8.2. | apply Archimedes' Principle |
|  | 8.3. | solve problems in fluid dynamics |
|  | 8.4. | show the steps used to solve the problem |
|  | 8.5. | include correct units of measure in your answer |
| 9. | Solve problems involving heat and temperature. | |
|  | Assessment Strategies | |
|  | 9.1. | Homework, quizzes, exams, and/or lab activities |
|  | Criteria | |
|  | 9.1. | complete temperature conversion problems |
|  | 9.2. | solve problems related to specific heat and latent heat |
|  | 9.3. | apply concepts related to heat transfer |
|  | 9.4. | solve problems related to gas laws |
|  | 9.5. | solve problems related to thermal expansion |
|  | 9.6. | apply the concepts of the First Law of Thermodynamics |
|  | 9.7. | show the steps used to solve the problem |
|  | 9.8. | include correct units of measure in your answer |
| 10. | Solve problems involving simple harmonic motion and waves | |
|  | Assessment Strategies | |
|  | 10.1. | Homework, quizzes, exams, and/or lab activities |
|  | Criteria | |
|  | 10.1. | solve problems related to simple harmonic motion |
|  | 10.2. | solve problems involving frequency, amplitude, wavelengths, and wave speed |
|  | 10.3. | describe interference and resonance |
|  | 10.4. | solve problems involving sound intensity levels |
|  | 10.5. | solve problems using the doppler effect |
|  | 10.6. | show the steps used to solve the problem |
|  | 10.7. | include correct units of measure in your answer |