Instructor: Paul Lockwood

Email contact: plockwood@sd43.bc.ca

Availability: Wednesdays 5:00pm-9:00pm

Introduction
Welcome to Physics 11 at Coquitlam Learning Opportunity Centre. This is a self-paced, self-directed interactive course that provides an introductory insight into an understanding of our physical world by examining the scope, nature, relevance and limitations of Physics. The topics in this course cover the intended learning outcomes for Physics 11 in BC. They have been chosen because they illustrate the substance of physics – they are accessible to most students, and are related to other aspects of your general education and life experiences.

Expectations
You will be expected to work independently through the online materials in Moodle – taking proper notes, working through the practice problems, Practice Assignments, and Self-Check Assignments. Individual help is available from your instructor at the Learning Centre. No laboratory work is included in this course.

Evaluation
Your course mark is based on 8 unit tests, one midterm, and the final exam:

<table>
<thead>
<tr>
<th>TEST</th>
<th>CONTENT</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1</td>
<td>Math Prep.</td>
<td>5</td>
</tr>
<tr>
<td>Unit 2</td>
<td>Kinematics 1D</td>
<td>8</td>
</tr>
<tr>
<td>Unit 3</td>
<td>Kinematics 2D</td>
<td>7</td>
</tr>
<tr>
<td>Unit 4</td>
<td>Forces 1D</td>
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<tr>
<td>Unit 5</td>
<td>Forces 2D</td>
<td>7</td>
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<tr>
<td>Midterm</td>
<td>Units 1 – 5</td>
<td>10</td>
</tr>
<tr>
<td>Unit 6</td>
<td>Energy</td>
<td>10</td>
</tr>
<tr>
<td>Unit 7</td>
<td>Circuits</td>
<td>10</td>
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<tr>
<td>Unit 8</td>
<td>Waves</td>
<td>10</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Units 1 – 8</td>
<td>25</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>75</strong></td>
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</table>
Important to Remember

1. All tests MUST be written in person at CLOC during Learning Centre hours.
2. **You need to write the first unit test within 30 days of registering for this course**.
3. You are allowed ONE rewrite for each unit test in Physics 11.
4. You will NOT be allowed to rewrite the midterm test or final exam.
5. If you choose to rewrite a test, you must complete the rewrite BEFORE proceeding further in the course.
6. If you choose to rewrite a test, the AVERAGE of the two test scores will be used in your course mark calculation.
7. Please note, rewrite privileges may be revoked at any time if a teacher determines that you are abusing the rewrite policy.
8. **The expectation is that the course is completed within ten months of registration.**

Students are expected to know the following:

- vector and scalar quantities
- horizontal uniform and accelerated motion
- projectile motion
- contact forces and the factors that affect magnitude and direction
- mass, force of gravity, and apparent weight
- Newton’s laws of motion and free-body diagrams
- balanced and unbalanced forces in systems
- conservation of energy; principle of work and energy
- power and efficiency
- simple machines and mechanical advantage
- electric circuits (DC), Ohm’s law, and Kirchhoff’s laws
- thermal equilibrium and specific heat capacity
- generation and propagation of waves
- properties and behaviours of waves
- characteristics of sound
- resonance and frequency of sound
- graphical methods in physics
Physics 11 2019 - Formula Sheet

For Right-angled Triangles:

\[ a^2 + b^2 = c^2 \]

\[ \sin \theta = \frac{b}{c} \quad \cos \theta = \frac{a}{c} \quad \tan \theta = \frac{b}{a} \]

\[ \text{area} = \frac{1}{2} ab \]

Kinematics

\[ v_{\text{avg}} = \frac{\Delta d}{\Delta t} \]
\[ v_{\text{avg}} = \frac{v_o + v_f}{2} \] (accelerating motion)
\[ a = \frac{\Delta v}{\Delta t} = \frac{v_f - v_o}{t_f - t_o} \]
\[ d = v_o t + \frac{1}{2} a t^2 \]
\[ g = -9.8 \, \text{m/s}^2 \]

Forces

\[ F_{\text{net}} = ma \]
\[ F_g = mg \] (weight)
\[ F_g = \frac{G m_1 m_2}{r^2} \] (universal)
\[ F_f = \mu F_N \]
\[ F_s = kx \]

Momentum

\[ p = mv \]
\[ \Delta p = F_{\text{net}} \times \Delta t \]
\[ \Sigma p_{\text{before}} = \Sigma p_{\text{after}} \]

Energy, Work, and Power

\[ \Sigma E_{\text{before}} = \Sigma E_{\text{after}} \]
\[ \text{Work} = F \times d \]
\[ E_k = \frac{1}{2} mv^2 \]
\[ E_p = mgh \]
\[ E_h = mc\Delta T \]
\[ P = \frac{W}{t} \]
\[ \% \text{efficiency} = \frac{\text{energy output}}{\text{energy input}} \times 100\% \]

Circuits

\[ I = \frac{Q}{t} \]
\[ V = IR \]
\[ P = VI = I^2 R = \frac{V^2}{R} \]
\[ P = \frac{\Delta E}{t} \]
\[ V_{\text{terminal}} = \varepsilon - Ir \]

Waves & Optics

\[ T = \frac{1}{f} \]
\[ \lambda = \frac{v}{f} \]
\[ \frac{\lambda_1}{\lambda_2} = \frac{v_1}{v_2} = \frac{n_2}{n_1} = \frac{\sin \theta_i}{\sin \theta_r} \]
\[ v_{\text{max}} = A \sqrt{\frac{k}{m}} \]
\[ T = 2\pi \sqrt{\frac{m}{k}} \]
\[ T = 2\pi \sqrt{\frac{l}{g}} \]

Constants & Conversions

\[ c = 3.00 \times 10^8 \, \text{m/s} \]
\[ G = 6.67 \times 10^{-11} \, \text{Nm}^2/\text{kg}^2 \]
\[ v_{\text{sound}} = 343 \, \text{m/s} \]
\[ c_{\text{water}} = 4200 \, \text{J/kgK(°C)} \]
\[ r_{\text{earth}} = 6.38 \times 10^6 \, \text{m} \]
\[ m_{\text{earth}} = 5.98 \times 10^{24} \, \text{kg} \]

<table>
<thead>
<tr>
<th>Medium</th>
<th>vacuum</th>
<th>Air</th>
<th>Water</th>
<th>Ethanol</th>
<th>Crown glass</th>
<th>Diamond</th>
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<td>1.0003</td>
<td>1.33</td>
<td>1.36</td>
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# PHYSICS 11 ONLINE 2019 – SCORE REPORT

**NAME:** ____________________________________________

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<th>FORM</th>
<th>SCORE (%)</th>
<th>WEIGHTED SCORE</th>
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<td>A</td>
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<tr>
<td>UNIT 2 (Kinematics 1D)</td>
<td>A</td>
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<td>UNIT 3 (Kinematics 2D)</td>
<td>A</td>
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<tr>
<td>UNIT 5 (Forces 2D)</td>
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<td>MIDTERM</td>
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**FINAL MARK** 100

**LETTER GRADE**

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**Active Date:**

**Teacher Signature:**

**Completion or Withdrawal Date:**

**Notes**