

**Instructor:** Paul Lockwood

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**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:

TEST	CONTENT	PERCENT
Unit 1	Math Prep.	5
Unit 2	Kinematics 1D	8
Unit 3	Kinematics 2D	7
Unit 4	Forces 1D	8
Unit 5	Forces 2D	7
Midterm	Units 1 – 5	10
Unit 6	Energy	10
Unit 7	Circuits	10
Unit 8	Waves	10
Final Exam	Units 1 – 8	25
<b>TOTAL</b>		

**Important to Remember**

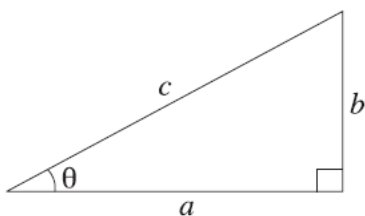
1. All tests **MUST** be written in person at CLOC during Learning Centre hours.
2. **\*\*You need to write the first unit test within 30 days of registering for this course\*\*.**
3. You are allowed **ONE** rewrite for each unit test in Physics 11.
4. You will **NOT** be allowed to rewrite the midterm 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

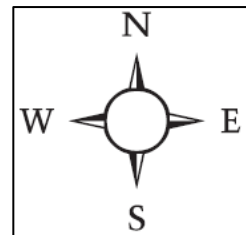
**For Right-angled Triangles:**



$$a^2 + b^2 = c^2$$

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

$$\text{area} = \frac{1}{2}ab$$



### **Kinematics**

$$v_{\text{avg}} = \frac{\Delta d}{\Delta t}$$

$$v_{\text{avg}} = \frac{v_o + v_f}{2} \text{ (accelerating motion)}$$

$$a = \frac{\Delta v}{\Delta t} = \frac{v_f - v_o}{t_f - t_o}$$

$$d = v_o t + \frac{1}{2} a t^2$$

$$d = \left( \frac{v_f + v_o}{2} \right) t$$

$$v_f = v_o + a t$$

$$v_f^2 = v_o^2 + 2 a d$$

$$g = -9.8 \text{ m/s}^2$$

### **Forces**

$$F_{\text{net}} = m a$$

$$F_g = m g \text{ (weight)}$$

$$F_g = \frac{G m_1 m_2}{r^2} \text{ (universal)}$$

$$F_f = \mu F_N$$

$$F_s = k x$$

### **Momentum**

$$p = m v$$

$$\Delta p = F_{\text{net}} \times \Delta t$$

$$\Sigma p_{\text{before}} = \Sigma p_{\text{after}}$$

### **Energy, Work, and Power**

$$\Sigma E_{\text{before}} = \Sigma E_{\text{after}}$$

$$\text{Work} = F \times d$$

$$E_k = \frac{1}{2} m v^2$$

$$E_p = m g h$$

$$E_h = m c \Delta T$$

$$P = \frac{W}{t}$$

$$\% \text{ efficiency} = \frac{\text{energy output}}{\text{energy input}} \times 100\%$$

### **Circuits**

$$I = \frac{Q}{t}$$

$$V = I R$$

$$P = V I = I^2 R = \frac{V^2}{R}$$

$$P = \frac{\Delta E}{t}$$

$$V_{\text{terminal}} = \varepsilon - I r$$

### **Waves & Optics**

$$T = \frac{1}{f}$$

$$v = f \lambda$$

$$\frac{\lambda_1}{\lambda_2} = \frac{v_1}{v_2} = \frac{n_2}{n_1} = \frac{\sin \theta_i}{\sin \theta_r}$$

$$v_{\text{max}} = A \sqrt{\frac{k}{m}}$$

$$T = 2\pi \sqrt{\frac{m}{k}}$$

$$T = 2\pi \sqrt{\frac{l}{g}}$$

### **Constants & Conversions**

$$c = 3.00 \times 10^8 \text{ m/s}$$

$$G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$$

$$v_{\text{sound}} = 343 \text{ m/s}$$

$$c_{\text{water}} = 4200 \text{ J/kgK}(\text{°C})$$

$$r_{\text{earth}} = 6.38 \times 10^6 \text{ m}$$

$$m_{\text{earth}} = 5.98 \times 10^{24} \text{ kg}$$

Medium	vacuum	Air	Water	Ethanol	Crown glass	Diamond
Index (n)	1.000	1.0003	1.33	1.36	1.52	2.42

# PHYSICS 11 ONLINE 2019 – SCORE REPORT

NAME: \_\_\_\_\_

TEST	DATE	FORM	SCORE (%)	WEIGHTED SCORE
UNIT 1 (Math Prep)	$\frac{A}{B}$	$\frac{A}{B}$	$\frac{A}{B}$	<u>5</u>
UNIT 2 (Kinematics 1D)	$\frac{A}{B}$	$\frac{A}{B}$	$\frac{A}{B}$	<u>8</u>
UNIT 3 (Kinematics 2D)	$\frac{A}{B}$	$\frac{A}{B}$	$\frac{A}{B}$	<u>7</u>
UNIT 4 (Forces 1D)	$\frac{A}{B}$	$\frac{A}{B}$	$\frac{A}{B}$	<u>8</u>
UNIT 5 (Forces 2D)	$\frac{A}{B}$	$\frac{A}{B}$	$\frac{A}{B}$	<u>7</u>
MIDTERM				<u>10</u>
UNIT 6 (Energy)	$\frac{A}{B}$	$\frac{A}{B}$	$\frac{A}{B}$	<u>10</u>
UNIT 7 (Circuits)	$\frac{A}{B}$	$\frac{A}{B}$	$\frac{A}{B}$	<u>10</u>
UNIT 8 (Waves)	$\frac{A}{B}$	$\frac{A}{B}$	$\frac{A}{B}$	<u>10</u>
FINAL EXAM				<u>25</u>
			<b>FINAL MARK</b>	<u>100</u>
			<b>LETTER GRADE</b>	

Active Date:	
Teacher Signature:	
Completion or Withdrawal Date:	
Notes	