

# Course Outline 2017/2018

## SPH4U1 - Physics, Grade 12, University Preparation



All courses within HDSB are taught in learning environments that promote inclusive education, and identify and eliminate discriminatory biases, systemic barriers, and power dynamics that limit the ability of students to participate, learn, grow, and succeed. All students see themselves reflected in the curriculum, their physical surroundings, and the broader environment, so that they are engaged in and empowered by their learning experiences.

*The expectations in Grade 12 Physics, University Preparation are organized in six strands, the first focusing on scientific investigation skills and the remaining five representing major topics in the study of physics. The six strands are as follows:*

<p><b>Scientific Investigation Skills and Career Exploration</b></p> <ul style="list-style-type: none"> <li>❑ Demonstrate scientific investigation skills in four areas: initiating and planning, performing and recording, analysing and interpreting and communicating.</li> <li>❑ Identify and describe a variety of careers related to the fields of science under study, and identify scientists, including Canadians, who have made contributions to those fields.</li> </ul>	<p><b>Revolutions in Modern Physics: Quantum Mechanics and Special Relativity</b></p> <ul style="list-style-type: none"> <li>❑ Light can show particle-like and wave-like behaviour, and particles can show wavelike behaviour.</li> <li>❑ The behaviour of light as a particle and the behaviour of particles as waves can be described mathematically.</li> <li>❑ Time is relative to a person's frame of reference.</li> <li>❑ The effects of relativistic motion can be described mathematically.</li> <li>❑ New theories can change scientific thought and lead to the development of new technologies.</li> </ul>
<p><b>Energy and Momentum</b></p> <ul style="list-style-type: none"> <li>❑ Energy and momentum are conserved in all interactions.</li> <li>❑ Interactions involving the laws of conservation of energy and conservation of momentum can be analysed mathematically.</li> <li>❑ Technological applications that involve energy and momentum can affect society and the environment in positive and negative ways.</li> </ul>	<p><b>Gravitational, Electric, and Magnetic Fields</b></p> <ul style="list-style-type: none"> <li>❑ Gravitational, electric, and magnetic forces act on matter from a distance.</li> <li>❑ Gravitational, electric, and magnetic fields share many similar properties.</li> <li>❑ The behaviour of matter in gravitational, electric, and magnetic fields can be described mathematically.</li> <li>❑ Technological systems that involve gravitational, electric, and magnetic fields can have an effect on society and the environment.</li> </ul>
<p><b>The Wave Nature of Light</b></p> <ul style="list-style-type: none"> <li>• Light has properties that are similar to the properties of mechanical waves.</li> <li>• The behaviour of light as a wave can be described mathematically.</li> <li>• Technologies that use the principles of the wave nature of light can have societal and environmental implications.</li> </ul>	<p><b>Dynamics</b></p> <ul style="list-style-type: none"> <li>❑ Forces affect motion in predictable and quantifiable ways.</li> <li>❑ Forces acting on an object will determine the motion of that object.</li> <li>❑ Many technologies that utilize the principles of dynamics have societal and environmental implications.</li> </ul>

## Learning Skills & Work Habits

- Responsibility
- Organization
- Self-Regulation
- Independent Work
- Collaboration
- Initiative

Learning skills and work habits are an important part of your growth. Learning Skills and Work Habits will be taught, assessed, evaluated, and shared on your report card. This gives you and your parents/guardians valuable information about your learning.

<b>How your grades will be determined</b>	
<p>Your work throughout the semester accounts for <b>70%</b> of your final grade:</p> <ul style="list-style-type: none"> <li>• Your teacher will collect and track evidence of your learning through observations of your work; conversations with you; and by evaluating the work you produce.</li> <li>• Your teacher will provide feedback to help you with further study and improvement</li> <li>• Your 70% work will be returned for your review and reflection.</li> </ul>	<p>15% <b>Knowledge &amp; Understanding:</b> subject-specific content acquired (knowledge), and the comprehension of its meaning and significance (understanding).</p> <p>20% <b>Application:</b> the use of knowledge and skills to make connections within and between various contexts.</p> <p>20% <b>Thinking:</b> the use of critical and creative thinking skills and/or processes.</p> <p>15% <b>Communication:</b> the conveying of meaning through various forms (oral, visual, and/or written).</p> <p><i>(The Science Teacher Subject Council has determined the weightings of the above categories for this course)</i></p>
<p>The Final Evaluations account for <b>30%</b> of your final grade<sup>3</sup>:</p> <ul style="list-style-type: none"> <li>• A portion of your Final Evaluation will take place in class at or near the end of your course. It will not require significant preparation outside of class time.<sup>2</sup></li> <li>• Another portion will take place during the Evaluation Block of time after classes end.</li> </ul>	<p><b>15% In Class Final Evaluation:</b></p> <p>A performance task consisting of an investigation or an open-ended problematic situation; completed during final four weeks of the course; individual student effort; evaluated by teacher.</p> <hr/> <p><b>15% Evaluation Block Final Evaluation:</b></p> <p>A 2 hour exam within a 2.5 hour time slot consisting of a variety of question types (e.g., short answer, multiple choice, extended response, problem solving, etc.); individual student effort; evaluated by teacher</p>
<p>Your <b>final grade</b> will be calculated by combining your Term (70%) grade and your Final Evaluations (30%).</p>	

For more information about what you need to know about...

- 1) [Meeting Timelines and Academic Honesty](https://goo.gl/KTAh40) <sup>1</sup>- goo.gl/KTAh40
- 2) [Final 30% Evaluations](https://goo.gl/W82PYL) <sup>2</sup> - goo.gl/W82PYL
- 3) [Determining Report Card Grade](https://goo.gl/FuzbMW) <sup>3</sup> - goo.gl/FuzbMW

Your teacher can provide you with a paper copy of this information if required.