



SCIENCE DEPARTMENT

COURSE: Grade 11 SciTech Physics

COURSE CODE: SPH3UR

OVERARCHING LEARNING GOALS

<p>Scientific Investigation and Skills and Career Exploration</p> <ul style="list-style-type: none"> • Demonstrate scientific investigation skills in four areas: initiating and planning, performing and recording, analysing and interpreting, and communicating. • 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. 	<p>Energy and Society</p> <ul style="list-style-type: none"> • Understand that energy can be transformed from one type into another. • Demonstrate an understanding of work, energy, and the law of conservation of energy by solving related problems. • Analyse technological applications that involve energy transformations and assess the impact on society and the environment.
<p>Kinematics</p> <ul style="list-style-type: none"> • Graph and interpret graphs of linear motion with uniform and non-uniform velocity. • Solve a variety of 1D and 2D motion problems by using vector and scalar quantities. • Analyse technological devices that apply the kinematics concepts and assess their impact on society and environment. 	<p>Waves and Sound</p> <ul style="list-style-type: none"> • Demonstrate an understanding of the properties of mechanical waves and sound and solve related problems. • Describe wave interactions and solve related problems. • Explain the applications of waves to music and to the design of buildings and structures.
<p>Forces</p> <ul style="list-style-type: none"> • Understand that forces acting on an object will determine the motion of that object. • Apply Newton’s laws in a variety of situations and problems. • Analyse technologies that apply the dynamics principles and assess their impact on society and environment. 	<p>Electricity and Magnetism</p> <ul style="list-style-type: none"> • Understand and explain the relationship between electricity and magnetism. • Analyse mixed electric circuits. • Explain the impact of electromagnetism on society.

SUCCESS CRITERIA

Kinematics

- I can investigate, analyze and represent motion using graphs and equations.
- I can solve a variety of problems including by adding and subtracting vector quantities, using vector diagrams, vector components and algebraic equations.
- I can analyse technological devices that apply the principles of kinematics and assess their impact on society and environment.

Forces

- I can draw FBDs to show and calculate forces and their components.
- I can investigate, analyse and apply Newton’s laws to find the relationship between the net force and the acceleration of an object in various situations.
- I can investigate and analyse how friction affects motion of objects.
- I can research and communicate my findings of the applications of forces to automotive technologies and sports.

Energy and Society

- I can calculate kinetic, gravitational, and total mechanical energy of objects in motion or at rest.
- I can solve problems using the work-energy theorem and the law of conservation of energy.
- I can investigate and analyse the conservation of energy and the energy transformations in various systems.
- I can analyse technological applications that involve energy transformations and assess the impact on society and the environment.

Waves and Sound

- I can investigate and describe the properties and interactions of mechanical waves, including sound.
- I can explain phenomena such as beats, resonance, damping, and the Doppler effect, and solve related problems.
- I can explain the applications of waves to music and to the design of buildings and structures.

Electricity and Magnetism

- I can apply Ohm's and Kirchhoff's laws to analyse mixt circuits.
- I can determine the direction of magnetic fields around current-carrying conductors and the direction of the magnetic force experienced by a current-carrying conductor.
- I can explain the operation of a DC motor.
- I can describe the law of the electromagnetic induction and Lenz's law.
- I can describe how generators, transformers, and the electrical grid work to provide electricity.

ASSESSMENT & EVALUATION

TERM EVALUATION – 70%

Assessment and evaluation in this course will be based on provincial curriculum expectations. Evaluation throughout the course and the final evaluation will incorporate four broad categories:

Knowledge and Understanding	Thinking/ Inquiry	Communication	Application
-knowledge of content -understanding of content	-planning and performing lab investigations -problem solving, critical thinking processes and skills	-expression and organization of ideas and information -use of conventions and terminology	-making connections to society, technology and the environment -transfer of knowledge and skills to unfamiliar contexts

Students will also receive descriptive feedback as part of the learning process which may not be assigned a mark. More detailed information regarding the Port Credit Secondary School Assessment and Evaluation policy can be found in the Student Agenda.

FINAL EVALUATION – 30%

The final evaluation will consist of an in-class, practical culminating task and/or a formal written exam.

LEARNING SKILLS

The following learning skills will be taught and assessed throughout the course and rated on the report card:

***Responsibility**

***Independent Work**

***Initiative**

***Organization**

***Collaboration**

***Self-regulation**

These skills will not be included in the final numeric mark. However, it is important to remember that the development of these skills is critical to academic achievement and does have a direct bearing on the final mark.