



# Physics Grade 11 – SPH3U

## Course Profile Outline

### Course Description/Rationale/Overview

This course develops students' understanding of the basic concepts of physics. Students will explore kinematics, with an emphasis on linear motion; different kinds of forces; energy transformations; the properties of mechanical waves and sound; and electricity and magnetism. They will enhance their scientific investigation skills as they test laws of physics. In addition, they will analyze the interrelationships between physics and technology, and consider the impact of technological applications of physics on society and the environment.

**Prerequisite:** Science, Grade 10, Academic

### Class Requirements:

#### Student Responsibility:

Students must seek assistance from the teacher and fellow students for all work missed due to absence and must make arrangements to complete missed work.

### Course Requirements/Department Policies

#### Attendance requirement

Students are required to log in at least once per week on course activities. Students are expected to spend approximately 7 hours per week for both online and offline learning activities. Students are required to keep a Student Learning Log for each course documenting online and offline activities.

#### What is considered an Absence?

If a student fails to login in two consecutive weeks, it will be considered as one absence. When a student has 2 absences, the school will issue a warning letter.

By mid-term (within two months from the start of a course), if a student fails to complete 40% of course work, the principal may ask the student to withdraw from the course.

### Evaluation

Assignments, projects, quizzes, tests, unit tests, mid-term evaluation, culminating activity and final examination

### Curriculum Strands

1. Kinematics
2. Forces
3. Energy and Society
4. Waves and Sound
5. Electricity and Magnetism

### Achievement Categories

- Knowledge and Understanding 30%
- Application 30%
- Thinking and Inquiry 20%
- Communication 20%

### Learning Skills and Work Habits

- Responsibility
- Organization
- Independent work
- Collaboration
- Initiative
- Self-regulation

<b>Evaluation</b>		<b>Final Mark</b>	
Term work		Term work	70%
Assignments	20%	Final	30%
Quizzes	15%		
Unit Tests	20%		
Mid-term	15%	Total	100%
Culminating Activity	10%		
Final Examination	20%		

## **Course Outline**

### **Unit 1: Kinematics (25 hours)**

By the end of this unit, students will:

- analyse technologies that apply concepts related to kinematics, and assess the technologies' social and environmental impact;
- investigate, in qualitative and quantitative terms, uniform and non-uniform linear motion, and solve related problems;
- demonstrate an understanding of uniform and non-uniform linear motion, in one and two dimensions.

### **Unit 2: Forces (25 hours)**

By the end of this unit, students will:

- analyse and propose improvements to technologies that apply concepts related to dynamics and Newton's laws, and assess the technologies' social and environmental impact;
- investigate, in qualitative and quantitative terms, net force, acceleration, and mass, and solve related problems;
- demonstrate an understanding of the relationship between changes in velocity and unbalanced forces in one dimension.

### **Unit 3: Energy and Society (20 hours)**

By the end of this unit, students will:

- analyze technologies that apply principles of and concepts related to energy transformations, and assess the technologies' social and environmental impact;
- investigate energy transformations and the law of conservation of energy, and solve related problems;
- demonstrate an understanding of work, efficiency, power, gravitational potential energy, kinetic energy, nuclear energy, and thermal energy and its transfer (heat).

#### **Unit 4: Waves and Sound (15 hours)**

By the end of this unit, students will:

- analyze how mechanical waves and sound affect technology, structures, society, and the environment, and assess ways of reducing their negative effects;
- investigate, in qualitative and quantitative terms, the properties of mechanical waves and sound, and solve related problems;
- demonstrate an understanding of the properties of mechanical waves and sound and of the principles underlying their production, transmission, interaction, and reception.

#### **Unit 5: Electricity and Magnetism (25 hours)**

By the end of this unit, students will:

- analyse the social, economic, and environmental impact of electrical energy production and technologies related to electromagnetism, and propose ways to improve the sustainability of electrical energy production;
- investigate, in qualitative and quantitative terms, magnetic fields and electric circuits, and solve related problems;
- demonstrate an understanding of the properties of magnetic fields, the principles of current and electron flow, and the operation of selected technologies that use these properties and principles to produce and transmit electrical energy.

#### **Resources**

Textbook: [\*Physics II. Nelson. \(2011\)\*](#)

**Supplementary Teaching Materials** Worksheets organized by the teacher