



# GEORGE S. HENRY ACADEMY COURSE OUTLINE



## Grade 12 University Preparation Physics

<b>COURSE CODE</b>	SPH4U	<b>GRADE</b>	12
<b>TEACHER(S)</b>	Krystyna Kedzia	<b>CREDIT VALUE</b>	1.0
<b>DEPARTMENT</b>	Science	<b>PREREQUISITE</b>	Physics, Grade11U

### COURSE DESCRIPTION:

This course enables students to deepen their understanding of physics concepts and theories. Students will continue their exploration of energy transformations and the forces that affect motion, and will investigate electrical, gravitational, and magnetic fields and electromagnetic radiation. Students will also explore the wave nature of light, quantum mechanics, and special relativity. They will further develop their scientific investigation skills, learning, for example, how to analyse, qualitatively and quantitatively, data related to a variety of physics concepts and principles. Students will also consider the impact of technological applications of physics on society and the environment.

Additional information can be found at: <http://www.edu.gov.on.ca/eng/curriculum/secondary/subjects.html>

### COMMUNICATION

Please direct all questions or concerns regarding student progress or program of study to the course teacher. Please call the main office to leave a message at 416-395-3240.

### CONCRETE LEARNING RESOURCES

Textbook: Nelson Physics 12 (Replacement Cost \$90)

### DIGITAL LEARNING RESOURCES

My School Day App - An App that allows you to stay up-to-date with in-class tasks.

### GEORGE S. HENRY ACADEMY'S COURSE WORK POLICY

For each evaluation, the teacher will inform students of the **due date** and the **ultimate deadline**. The ultimate deadline is the last opportunity for students to submit an assignment for evaluation. Teachers may also use a variety of other methods for dealing with late and missed assignments at their discretion.

#### Strategies to assist students in meeting deadlines include:

- Peer tutoring
- Using the school app
- Using a personal agenda
- Seeking extra help from teachers
- Requesting for assistance with time management and organizational skills
- Getting help from parents/guardians
- Getting help from a caring adult in the school

## ASSESSMENT AND EVALUATION OF STUDENT ACHIEVEMENT

Each course follows an achievement chart which enables teachers to make judgements about student work that are based on clear performance standards and on a body of evidence collected over time. Additional information can be found on the Ministry of Education website noted within the course description.

### ACHIEVEMENT CHART CATEGORIES

**Knowledge and Understanding (K & U):** Subject-specific content acquired in each course (knowledge), and the comprehension of its meaning and significance (understanding)

**Thinking & Inquiry (T & I):** The use of critical and creative thinking skills and/or processes

**Communication (C):** The conveying of meaning through various forms

**Application (A):** The use of knowledge and skills to make connections within and between various contexts

### COURSE WORK (70% of your overall grade)

Categories	%	Possible Assessments of Learning
<b>K &amp; U</b>	<b>30%</b>	<ul style="list-style-type: none"> <li>• knowledge of content (e.g., facts, terminology, definitions, safe use of equipment and materials)</li> <li>• understanding of content (e.g., concepts, ideas, theories, principles, procedures, processes)</li> </ul>
<b>T &amp; I</b>	<b>15%</b>	<ul style="list-style-type: none"> <li>• use of initiating and planning skills and strategies (e.g., formulating questions, identifying the problem, developing hypotheses, selecting strategies and resources, developing plans)</li> <li>• use of processing skills and strategies (e.g., performing and recording, gathering evidence and data, observing, manipulating materials and using equipment safely, solving equations, proving)</li> <li>• use of critical/creative thinking processes, skills, and strategies (e.g., analysing, interpreting, problem solving, evaluating, forming and justifying conclusions on the basis of evidence)</li> </ul>
<b>C</b>	<b>15%</b>	<ul style="list-style-type: none"> <li>• expression and organization of ideas and information (e.g., clear expression, logical organization) in oral, visual, and/or written forms (e.g., diagrams, models)</li> <li>• communication for different audiences (e.g., peers, adults) and purposes (e.g., to inform, to persuade) in oral, visual, and/or written forms</li> <li>• use of conventions, vocabulary, and terminology of the discipline in oral, visual, and written forms (e.g., symbols, formulae, scientific notation, SI units)</li> </ul>
<b>A</b>	<b>15%</b>	<ul style="list-style-type: none"> <li>• application of knowledge and skills (e.g., concepts and processes, safe use of equipment, scientific investigation skills) in familiar contexts</li> <li>• transfer of knowledge and skills (e.g., concepts and processes, safe use of equipment, scientific investigation skills) to unfamiliar contexts</li> <li>• making connections between science, technology, society, and the environment (e.g., assessing the impact of science on technology, people and other living things, and the environment)</li> <li>• proposing courses of practical action to deal with problems relating to science, technology, society, and the environment</li> </ul>

**FINAL EVALUATION (30% of your overall grade)**

Type	Description	%
Culminating Task		N/A
Exam	Formal written examination during exam week.	30%

**UNITS OF STUDY/COURSE ROAD MAP (subject to change)****Strand A. Scientific Investigation Skills and Career Exploration**

A1. demonstrate scientific investigation skills (related to both inquiry and research) in the four areas of skills (initiating and planning, performing and recording, analysing and interpreting, and communicating);

A2. identify and describe careers related to the fields of science under study, and describe the contributions of scientists, including Canadians, to those fields.

**Strand B. Dynamics**

B1. analyse technological devices that apply the principles of the dynamics of motion, and assess the technologies' social and environmental impact;

B2. investigate, in qualitative and quantitative terms, forces involved in uniform circular motion and motion in a plane, and solve related problems;

B3. demonstrate an understanding of the forces involved in uniform circular motion and motion in a plane.

**Strand C. Energy and Momentum**

C1. analyse, and propose ways to improve, technologies or procedures that apply principles related to energy and momentum, and assess the social and environmental impact of these technologies or procedures;

C2. investigate, in qualitative and quantitative terms, through laboratory inquiry or computer simulation, the relationship between the laws of conservation of energy and conservation of momentum, and solve related problems;

C3. demonstrate an understanding of work, energy, momentum, and the laws of conservation of energy and conservation of momentum, in one and two dimensions.

**Strand D. Gravitational, Electric, and Magnetic Fields**

D1. analyse the operation of technologies that use gravitational, electric, or magnetic fields, and assess the technologies' social and environmental impact;

D2. investigate, in qualitative and quantitative terms, gravitational, electric, and magnetic fields, and solve related problems;

D3. demonstrate an understanding of the concepts, properties, principles, and laws related to gravitational, electric, and magnetic fields and their interactions with matter.

### Strand E. The Wave Nature of Light

E1. analyse technologies that use the wave nature of light, and assess their impact on society and the environment;

E2. investigate, in qualitative and quantitative terms, the properties of waves and light, and solve related problems;

E3. demonstrate an understanding of the properties of waves and light in relation to diffraction, refraction, interference, and polarization.

### Strand F. Revolutions in Modern Physics: Quantum Mechanics and Special Relativity

F1. analyse, with reference to quantum mechanics and relativity, how the introduction of new conceptual models and theories can influence and/or change scientific thought and lead to the development of new technologies;

F2. investigate special relativity and quantum mechanics, and solve related problems;

F3. demonstrate an understanding of the evidence that supports the basic concepts of quantum mechanics and Einstein's theory of special relativity.

## GEORGE S. HENRY ACADEMY'S LATE & MISSED EVALUATION POLICY

It is the responsibility of the student to make arrangements with their teacher for any missed course material and/or assignments. Extenuating circumstances will be considered on a case-by-case basis.

## GEORGE S. HENRY ACADEMY'S ACADEMIC DISHONESTY POLICY

Cheating and plagiarism will not be condoned. For more information, refer to the Academic Honesty Policy found in the Student Handbook. The Student Handbook can be found in the George S. Henry Academy app.

## SPECIALIST HIGH SKILLS MAJOR (SHSM) REQUIREMENTS

GRADE 11 AND 12 CREDITS	ENVIRONMENT	HEALTH & WELLNESS	HOSPITALITY & TOURISM
Major Credits	4	4	4
English ( <i>including a CLA*</i> )	2	1	1
Mathematics ( <i>including a CLA</i> )	1	1	1
Science or Social Sciences and Humanities ( <i>including a CLA</i> ) ( <i>May be substituted with 1 coop credit</i> )	-	1	-
Business Studies or Science ( <i>including a CLA</i> ) ( <i>May be substituted with 1 coop credit</i> )			1
Cooperative Education	2	2	2
<b>TOTAL</b>	<b>9</b>	<b>9</b>	<b>9</b>

\*Contextualized Learning Activity