

# Course of Study and Evaluation Statement

SPH4U Physics Grade 12 University Preparation

**Note 1:** All Ontario Ministry of Education curriculum documents with full course content information can be located at <http://www.edu.gov.on.ca/eng/curriculum/secondary/subjects.html>

**Note 2:** Detailed information on Ministry of Education assessment, evaluation, and reporting policy is provided at <http://www.edu.gov.on.ca/eng/curriculum/secondary/progplan912curr.pdf>

## Course Details

- Program Area: Science
- Course title: Physics grade 12, University Preparation - SPH4U Credit Value 1.0
- Prerequisite: Physics grade 11, University Preparation - SPH3U
- Textbook: Physics 12, Nelson

## Overall Goals

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. Students will also explore the wave nature of light, quantum mechanics and special relativity. They will further develop their scientific investigation skills, learning 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.

## Program Planning Considerations

**Individual Education Plans.** Accommodations to meet the needs of exceptional students as set out in their Individual Education Plan will be implemented within the classroom program. Additional assistance is available through the Special Education program.

**Technology.** Using information technology will assist students in the achievement of many of the expectations in the curriculum regarding research, written work, analysis of information, and visual presentations.

**English As a Second Language.** Appropriate accommodations in teaching, learning, and evaluation strategies will be made to help ESL students gain proficiency in English.

**Scientific Investigation Skills.** Students will 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.

**Career Exploration.** Our course will help students identify and describe careers related to the fields of science under study, and describe the contributions of scientists, including Canadians, to those fields.

## Learning Skills

Learning Skills are habits that are essential to success in school and in the workplace.

The evaluated learning skills are:

Responsibility, Organization, Independent Work, Collaboration, Initiative and Self-regulation.

Teachers report achievement on the six Learning Skills using letter symbols:

E = Excellent, G = Good, S = Satisfactory, N = Needs Improvement.

Learning Skills clearly affect levels of achievement, but they are not part of the evaluation of achievement and are not included in the midterm mark or final course mark.

## Academic Honesty: Cheating and Plagiarism

Students are expected to submit only their own original work on evaluations done in class or out of class. Plagiarism is the passing off the ideas or writings of another as one's own. Cases of academic dishonesty (cheating and/or plagiarism) will be dealt with on a case-by-case basis, but each case will involve an investigation, communication with the student and his/her parent/guardian, and a mark of zero for the plagiarized work. Whether the student has an opportunity to demonstrate his/her learning in another assignment will be at the discretion of the teacher and/or Principal.

## Teaching Strategies

Teachers use a variety of teaching strategies to maximize student learning. The following teaching strategies will be used in this course:

### Direct Instruction - teacher centered

This strategy includes methods such as: lectures, projected lectures, didactic questioning, explicit teaching, practice and drill, demonstrations.

### Indirect Instruction - student centered

Indirect instruction involves methods such as group inquiry, discovery, problem solving and decision making

### Independent Study

Independent Study fosters the development of individual student initiative, self-reliance and self improvement

## Assessment and Evaluation Strategies

The primary purpose of assessment and evaluation is to improve student learning.

*Assessment* is the process of gathering information from assignments, demonstrations, projects, performances, and tests that accurately reflects how well a student is achieving the curriculum expectations in a course. As part of assessment, teachers provide students with feedback that guides their efforts towards improvement.

*Evaluation* refers to the process of judging the quality of student work on the basis of established criteria, and assigning a value to represent that quality. In Ontario secondary schools, the value assigned will be in the form of a percentage grade.

In this course, the following evaluation strategies will be used: tests, quizzes, assignments. The student portfolio containing the evidence of all the work completed throughout the semester will be used to determine the final mark as well.

### **Achievement Categories**

The following chart provides a standard, province-wide method for teachers to use in assessing and evaluating their students' achievement. Students are evaluated according to the major categories or strands in each course. Ministry curriculum documents provide detailed description of student achievement levels. In this course, students are evaluated in four categories, according to the weightings shown:

Knowledge and Understanding	Thinking and Inquiry	Communications	Application
25%	25%	25%	25%

### **70% of the final mark**

Students need to demonstrate their achievement in all the overall expectations of the course. Seventy percent of the final mark will be based on the evaluations done throughout the semester.

### **30% of the final mark**

All students must take part in the culminating activities for each course at every grade and level of study. Culminating activities take place within the last three weeks of classes.

### **Missed tests/quizzes policy**

If a student is legitimately absent for an evaluation, upon return to school they must have a doctor's note or a note from their parent or guardian stating the reason for their absence. At that time and at the convenience of the teacher, the student will write a makeup evaluation. If a student does not have a valid reason for his/her absence, a mark of zero will be given.

### **Teacher**

Communication related to course activities will take place through email or in person in room 221.

Teacher: Cornel Geomolean

Email: [Cornel.Geomolean@tdsb.on.ca](mailto:Cornel.Geomolean@tdsb.on.ca)

## Course Content

The overall expectations for each of our five units of study are included below:

Units of Study	Overall Expectations
<b>Kinematics and Dynamics</b>	<i>B1. analyse technological devices that apply the principles of the dynamics of motion, and assess the technologies' social and environmental impact</i> <i>B2. investigate, in qualitative and quantitative terms, forces involved in uniform circular motion and motion in a plane, and solve related problems</i> <i>B3. demonstrate an understanding of the forces involved in uniform circular motion and motion in a plane</i>
<b>Energy and Momentum</b>	<i>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</i> <i>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</i> <i>C3. demonstrate an understanding of work, energy, momentum, and the laws of conservation of energy and conservation of momentum, in one and two dimensions.</i>
<b>Gravitational, Electric and Magnetic Fields</b>	<i>D1. analyse the operation of technologies that use gravitational, electric, or magnetic fields, and assess the technologies' social and environmental impact</i> <i>D2. investigate, in qualitative and quantitative terms, gravitational, electric, and magnetic fields, and solve related problems</i> <i>D3. demonstrate an understanding of the concepts, properties, principles, and laws related to gravitational, electric, and magnetic fields and their interactions with matter</i>
<b>Light</b>	<i>E1. analyse technologies that use the wave nature of light, and assess their impact on society and the environment</i> <i>E2. investigate, in qualitative and quantitative terms, the properties of waves and light, and solve related problems</i> <i>E3. demonstrate an understanding of the properties of waves and light in relation to diffraction, refraction, interference, and polarization</i>
<b>Revolutions in Physics</b>	<i>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</i> <i>F2. investigate special relativity and quantum mechanics, and solve related problems;</i> <i>F3. demonstrate an understanding of the evidence that supports the basic concepts of quantum mechanics and Einstein's theory of special relativity</i>