

## Physics, Grade 11, University Preparation SPH3U Course Outline

Victoria Park Collegiate Institute, TDSB  
 The Ontario Curriculum: The Ontario Curriculum: Science 2008  
 Grade 11 University Preparation, 1.0 credit  
 Prerequisites: Grade 10 Academic Science  
 Recommended additional pre- or co-requisite:  
 Completion of, or concurrent enrolment in a Grade 11 University Mathematics course  
 Assistant Curriculum Leaders:  
 S. Reichling, K. Thorne, Science Office room 221; extension 20095

### Course Description

This course develops students' understanding of the basic concepts of physics. Students will study the laws of dynamics and explore different kinds of forces, the quantification and forms of energy (mechanical, sound, light, thermal, and electrical), and the way energy is transformed and transmitted. They will develop scientific-inquiry skills as they verify accepted laws and solve both assigned problems and those emerging from their investigations. Students will also analyse the interrelationships between physics and technology, and consider the impact of technological applications of physics on society and the environment.

### Resources

Text: *Physics 11*, published by Nelson. **Replacement Cost: \$110**

### Curriculum Expectations

#### **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.

#### **Kinematics: By the end of this course, students will:**

**B1.** analyse technologies that apply concepts related to kinematics, and assess the technologies' social and environmental impact;

**B2.** investigate, in qualitative and quantitative terms, uniform and non-uniform linear motion, and solve related problems;

**B3.** demonstrate an understanding of uniform and non-uniform linear motion, in one and two dimensions.

#### **Forces: By the end of this course, students will:**

**C1.** analyse and propose improvements to technologies that apply concepts related to dynamics and Newton's laws, and assess the technologies' social and environmental impact;

**C2.** investigate, in qualitative and quantitative terms, net force, acceleration, and mass, and solve related problems;

**C3.** demonstrate an understanding of the relationship between changes in velocity and unbalanced forces in one dimension.

#### **Energy and Society: By the end of this course, students will:**

**D1.** analyse technologies that apply principles of and concepts related to energy transformations, and assess the technologies' social and environmental impact;

**D2.** investigate energy transformations and the law of conservation of energy, and solve related problems;

**D3.** demonstrate an understanding of work, efficiency, power, gravitational potential energy, kinetic energy, nuclear energy, and thermal energy and its transfer (heat).

**Waves and Sound: By the end of this course, students will:**

**E1.** analyse how mechanical waves and sound affect technology, structures, society, and the environment, and assess ways of reducing their negative effects;

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

**E3.** demonstrate an understanding of the properties of mechanical waves and sound and of the principles underlying their production, transmission, interaction, and reception.

**Electricity and Magnetism: By the end of this course, students will:**

**F1.** 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;

**F2.** investigate, in qualitative and quantitative terms, magnetic fields and electric circuits, and solve related problems;

**F3.** 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.

**Course Content:**

Unit	Timeline
Kinematics	24 hours
Forces	24 hours
Energy and Society	20 hours
Waves and Sound	25 hours
Electricity and Magnetism	17 hours

*\*Times listed are approximate. Order of instruction may vary.*

**Course Evaluation**

**Learning Skills**

Students will be assessed on the following Six Learning Skills;

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

**Teaching/Assessment and Evaluation Strategies**

A range of instructional strategies will be used to address student needs. Some of these strategies include direct instruction, interactive instruction, experiential learning and independent study. Students are given opportunities to learn through assessment before evaluations. **Summative evaluation for this course is based on a final exam.**

**Achievement Chart**

**Knowledge and Understanding –K&U – (30%)**

Evaluation may include quizzes, homework checks, tests, problem sets, assignments, facts, terms, concepts, applications, etc.

**Communication – C – (20%)**

Evaluation may be based on laboratory reports, written reports, essays, oral presentations, in-class questions and answers, etc.

**Thinking and Inquiry – T/I – (25%)**

Evaluation may include application of scientific inquiry, applications of technical skills, use of tools and equipment, open ended test questions, concept maps, formulating questions, etc.

### Applications – A – (25%)

Evaluation may include research papers, projects, debates, interviews, analyzing issues, assessing impacts and proposing courses of action, understanding connections among Science, Technology, Society and the Environment, etc.

### 70% Grade on Course Work\*\*

#### Kinematics

Task	Achievement Chart Focus				Time of Assessment
	K&U	T/I	C	A	
Kinematics Assessment	X			X	
Kinematics Lab/Assignment		X	X		
Unit Test	X	X	X	X	

#### Forces

Task	Achievement Chart Focus				Time of Assessment
	K&U	T/I	C	A	
Dynamics Assessment	X			X	
Dynamics Lab/Assignment		X	X		
Unit Test	X	X	X	X	

#### Energy, Work, and Power

Task	Achievement Chart Focus				Time of Assessment
	K&U	T/I	C	A	
Work and Energy Assessment	X			X	
Energy and Power Lab/Assignment		X	X		
Unit Test	X	X	X	X	

#### Waves and Sound

Task	Achievement Chart Focus				Time of Assessment
	K&U	T/I	C	A	
Wave and Sound Assessment	X			X	
Wave and Sound Lab/Assignment		X	X		
Unit Test	X	X	X	X	

#### Electricity and Magnetism

Task	Achievement Chart Focus				Time of Assessment
	K&U	T/I	C	A	
Electricity and Magnetism Assessment 1	X			X	
Electricity and Magnetism Assessment 2 / Lab		X	X		
Unit Test	X	X	X	X	

\*\* Above task list subject to changes. Many of the above tasks will include Higher Order Thinking Skills (HOTS).

\*\*Lab and lab activities involve skills. Evaluation of labs and skills are done on those actually performed by the student. Lab materials are seldom available after the activity. Regular attendance is critical for participation in and evaluation of these labs and skills.

### **30% Grade Based on Common Course-Culminating Activities**

All students will write a final exam during exam week at the end of the course. A doctor's note will be required for absences from culminating activities and exams. For more detail, please consult the Student Agenda.

### **Late Assignments/Missed Evaluations**

5% per school day will be deducted for late assignments at the teacher's discretion

Missed tests or quizzes may result in a mark of zero if appropriate documentation is not provided.

Chronic absences from evaluations may result in referral to administration.

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### **Grade Reports throughout the Year**

The grade for each term/reporting period is based on the evaluations that have been conducted to that point in the course. They will be based on the most consistent level of achievement to that time. The students' grades may change when all work is evaluated by the end of the course. An interim report will be sent home in October/March. Midterm reports will be sent home with the students approximately half way through the semester.

### **Accommodations**

Accommodations refer to the teaching strategies, supports, and/or services that are required in order for a student to access the curriculum and demonstrate learning. Students who have an IEP are entitled to the accommodations specified in their plans.

The following considerations apply to each of the units in this course: *Instructional and assessment activities must take into account the strengths, needs, learning expectations and accommodations as identified in the Individual Education Plan whether students are formally identified or not.* (Regulation 181/98)

### **Policies and Procedures**

See the Victoria Park C.I. Student Agenda for additional details on School Policies on Homework, Attendance, Lateness, Missing and Late Assignments and Assessments, Course Modifications and Academic Honesty.