Riverdale Collegiate Institute – Toronto District School Board
EVALUATION POLICY and COURSE OUTLINE 2012

Riverdale Collegiate Institute
Course of Study

Grade 12, Physics, University Preparation (SPH4U1)

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/science1112curr.pdf

Note 2: Detailed information on Ministry of Education assessment, evaluation, and reporting policy is provided in Ontario Schools, Kindergarten to Grade 12, Policy and Program Requirements (OS), 2011, located at http://www.edu.gov.on.ca/eng/document/policy/os/index.html

1. Course Details

- Program Area: Science
- Curriculum Leader: Salmaa Muhammad-Gold
- Course title: Grade 12, Physics, (SPH4U1). Credit Value: One
- Prerequisites(s) and co-requisite(s): Grade 11, Physics, University Preparation, SPH3U1
- Textbook(s) and resource materials that are essential to the course:

TEXTBOOK(S):	**Replacement Cost (if lost or damaged):**
Nelson Physics 12	$80.00
MATERIALS:	**Replacement Cost (if lost or damaged):**

SUPPLEMENTARY RESOURCES:
Software:

MINISTRY OF EDUCATION CURRICULUM POLICY DOCUMENT:
The Ontario Curriculum, Grades 11 and 12: Science, 2008 (revised)

2. Overall Goals

- 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.

Overall Expectations

A. Scientific Investigation Skills and Career Exploration

Throughout this course, 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);
- identify and describe careers related to the fields of science under study, and describe the contributions of scientists, including Canadians, to those fields.

B1. Kinematics

By the end of this course, students will:

- analyse technologies that apply concepts related to kinematics, and assess the technologies' social and environmental impact;
- demonstrate an understanding of relative and non-uniform motion in two dimensions.

B2. Dynamics

By the end of this course, students will:

- analyse technological devices that apply the principles of the dynamics of motion, and assess the technologies' social and environmental impact;
- investigate, in qualitative and quantitative terms, forces involved in uniform circular motion and motion in a plane, and solve related problems;
- demonstrate an understanding of the forces involved in uniform circular motion and motion in a plane.

C. Energy and Momentum

By the end of this course, students will:

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

D. Gravitational, Electric, and Magnetic Fields

By the end of this course, students will:

- analyse the operation of technologies that use gravitational, electric, or magnetic fields, and assess the technologies' social and environmental impact;
- investigate, in qualitative and quantitative terms, gravitational, electric, and magnetic fields, and solve related problems;
- demonstrate an understanding of the concepts, properties, principles, and laws related to gravitational, electric, and magnetic fields and their interactions with matter.

E. The Wave Nature of Light

By the end of this course, students will:

- analyse technologies that use the wave nature of light, and assess their impact on society and the environment;
- investigate, in qualitative and quantitative terms, the properties of waves and light, and solve related problems;
- demonstrate an understanding of the properties of waves and light in relation to diffraction, refraction, interference, and polarization.

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

By the end of this course, students will:

- 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;
- investigate special relativity and quantum mechanics, and solve related problems;
- demonstrate an understanding of the evidence that supports the basic concepts of quantum mechanics and Einstein's theory of special relativity.

Units/Topics	Timing
A. Scientific Investigation Skills and Career Exploration	Throughout Course
B1. Kinematics	10 classes
B2. Dynamics	15 classes
C. Energy and Momentum	16 classes
D. Gravitational, Electric, and Magnetic Fields	18 classes
E. The Wave Nature of Light	15 classes
F. Revolutions in Modern Physics: Quantum Mechanics and Special Relativity	10 classes
Culminating Activities &/Or Final Exam Preparation	4 classes

EVALUATION PLAN

As required by the Ministry of Education and Training, each student is evaluated according to the four achievement categories: **Knowledge/Understanding, Thinking, Communication and Application**

	Knowledge & Understanding	Thinking	Communication	Application
TERM (70%)	**20**	**20**	**15**	**15**
FINAL EVALUATION (30%)	This evaluation is cumulative, containing material from all units and will evaluate all 4 achievement categories.			

70% Term Work

Students must demonstrate achievement of all the overall expectations of the course.

Unit	Task	Achievement Category Focus	Date Due (tentative)
1A. Kinematics	Quiz	K/U, T, C, A	
	Lab/Project/Assignment	K/U, T, C, A	
	Test	K/U, T, C, A	October 1/2
1B. Dynamics	Quiz	K/U, T, C, A	
	Lab/Project/Assignment	K/U, T, C, A	
	Test	K/U, T, C, A	November 19/20
2. Energy and Momentum	Quiz	K/U, T, C, A	
	Lab/Project/Assignment	K/U, T, C, A	
	Test	K/U, T, C, A	January 14/15
3. Gravitational, Electric, and Magnetic Fields	Quiz	K/U, T, C, A	
	Lab/Project/Assignment	K/U, T, C, A	
	Test	K/U, T, C, A	January 28/29
4. The Wave Nature of Light	Quiz	K/U, T, C, A	
	Lab/Project/Assignment	K/U, T, C, A	
	Test	K/U, T, C, A	March 11/12
5. Revolutions in Modern Physics: Quantum Mechanics and Special Relativity	Quiz	K/U, T, C, A	
	Lab/Project/Assignment	K/U, T, C, A	
	Test	K/U, T, C, A	May 13/14

In addition to the evaluations listed above, individual teachers may include other evaluations.

REPORTING

Four Reports Cards will be issued during the year. All reports will give a numeric grade to each student calculated as indicated above. All reports are cumulative. The November, February and April report cards are snapshots of all course work until that point in time. They will be based on the most consistent level of achievement to that point in time.

LEARNING SKILLS

Learning skills are critical for achievement of the curriculum expectations. On each report card there are 6 learning skills: Responsibility, Organization, Independent Work, Collaboration, Initiative and Self-regulation. Teachers report on the six Learning Skills using the following: E = Excellent, G = Good, S = Satisfactory, N = Needs Improvement.

Learning skills are not used to determine a student's grade in the course.

TEACHING /ASSESMENT AND EVALUATION STRATEGIES

A range of teaching, assessment and evaluation strategies will be used to address the needs of students' learning styles and allow students a variety of methods to demonstrate their achievement of the expectations.

Teaching Strategies

To facilitate the learning of the various concepts, a variety of teaching strategies will be used and might include:

Activity Based Strategies
examples: practical laboratory work, oral presentations, field trip, simulations, activity centres)

Cooperative Learning Strategies
examples: Think-Pair-Share, Teams-Games-Tournament, Group Investigation

Arts Based Strategies **e**xamples: drawing and origami

Direct Instruction Strategies
examples: Socratic dialogue, lecture, demonstration, conferencing, review, tutorial, textbook

Independent Learning Strategies
examples: homework, independent reading/study, memorization, note making, reports

Inquiry/Research Models
examples: inquiry process, research process, scientific process, writing process

Technology Applications
examples: database application, internet websites and research, media presentation

Thinking Skills Strategies
examples: brainstorming, classifying, concept mapping, concept attainment, concept formation, experimenting, expressing another point of view, graphing, issue-based analysis, lateral thinking, oral explanation, problem solving

Assessment

The primary purpose of assessment is to improve student learning. Assessment is ongoing, varied in nature and allows students to assess their own progress and determine next steps.

The following assessment strategies may be used at different times throughout the course:

quizzes, practice tests, conferencing, practical skill checks, written assignments, self-assessment/peer-assessment, reflective summary

Evaluation

Evaluation is varied and is used to determine a student's achievement grade.

The following evaluation strategies may be used at different times throughout the course:

quizzes, tests, written lab reports, practical skill checks, written assignments, projects, presentations, written exams