SPH3U Earl of March Secondary School
Course Outline

Course description and evaluation

Course : Physics, Grade 11, University Preparation (SPH3U)

Instructor: Mr. Amini

Text book
Nelson Physics 11; Al Hirsch, David Martindale, Steve Bibla, Charles Stewart; Nelson Thomson Learning, 2001

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, radiant, thermal, and electrical), and the way energy is transformed and transmitted. They will develop scientific-inquiry skills as they verify accepted laws and analyse the interrelationships between physics and technology, and consider the impact of technological applications of physics on society and the environment.

Units of Study	Key Learning Expectations
1. Kinematics	1. analyse technologies that apply concepts related to kinematics, and assess the technologies' social and environmental impact; 2. investigate, in qualitative and quantitative terms, uniform and non-uniform linear motion, and solve related problems; 3. demonstrate an understanding of uniform and non-uniform linear motion, in one and two dimensions.
2. Forces	1. analyse and propose improvements to technologies that apply concepts related to dynamics and Newton's laws, and assess the technologies' social and environmental impact; 2. investigate, in qualitative and quantitative terms, net force, acceleration, and mass, and solve related problems; 3. demonstrate an understanding of the relationship between changes in velocity and unbalanced forces in one dimension.
3. Energy and Society	1. analyse technologies that apply principles of and concepts related to energy transformations, and assess the technologies' social and environmental impact; 2. investigate energy transformations and the law of conservation of energy, and solve related problems; 3. demonstrate an understanding of work, efficiency, power, gravitational potential energy, kinetic energy, nuclear energy, and thermal energy and its transfer (heat).
4. Waves and Sound	1. analyse how mechanical waves and sound affect technology, structures, society, and the environment, and assess ways of reducing their negative effects; 2. investigate, in qualitative and quantitative terms, the properties of mechanical waves and sound, and solve related problems; 3. demonstrate an understanding of the properties of mechanical waves and sound and of the principles underlying their production, transmission, interaction, and reception.
5. Electricity and Magnetism	1. 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; 2. investigate, in qualitative and quantitative terms, magnetic fields and electric circuits, and solve related problems; 3. 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.

Absences
If a student is aware that he/she will be away for a class in advance, the student should inform the teacher and make arrangements to keep up with the class.

Evaluations
Students are expected to attend school for all evaluations. For approved absences, students must provide a written note from a parent or gardian to explain the absence, and appropriate alternate arrangements will be made.

Learning Skills

The Student will be assessed on the following learning skills: homework, organization, teamwork, initiative, and ability to work independently. These learning skills will be assessed on a regular basis and will be reported separately on the report card.

Assessment and Evaluation

- 70% of the grade will be based upon evaluations conducted throughout the course. This portion of the grade will reflect the student's most consistent level of achievement throughout the course, although special consideration will be given to more recent evidence of achievement
- 30% of the grade will be based on a final exam administered at the end of the course.

Rubric for Assessment and Evaluation

(Adapted from the Ontario Curriculum Grades 11 and 12 Science, 2000)

Categories	Level One 50-59%	Level Two 60-69%	Level Three 70-79%	Level Four 80-100%
Knowledge/Understanding	**The Student**			
understanding of concepts, principles, laws, and theories (e.g., identifying assumptions; eliminating misconceptions; providing explanations)	demonstrates limited understanding of concepts	demonstrates some understanding of concepts	demonstrates considerable understanding of concepts	demonstrates thorough understanding of concepts
knowledge of facts and terms	demonstrates limited knowledge of facts and terms	demonstrates some knowledge of facts and terms	demonstrates considerable knowledge of facts and terms	demonstrates thorough knowledge of facts and terms
understanding of relationships between concepts	demonstrates limited understanding of relationships between concepts	demonstrates some understanding of relationships between concepts	demonstrates considerable understanding of relationships between concepts	demonstrates thorough understanding of relationships between concepts
Inquiry	**The Student**			
application of the skills and strategies of scientific inquiry (e.g., initiating and planning, analysing and interpreting, problem solving)	applies few of the skills and strategies of scientific inquiry	applies some of the skills and strategies of scientific inquiry	applies most of the skills and strategies of scientific inquiry	applies all or almost all of the skills and strategies of scientific inquiry
application of technical skills and procedures (e.g., procedures in using microscopes)	applies technical skills and procedures with limited competence	applies technical skills and procedures with moderate competence	applies technical skills and procedures with considerable competence	applies technical skills and procedures with a high degree of competence
use of tools, equipment, and materials	uses tools, equipment, and materials safely and correctly only with supervision	uses tools, equipment, and materials safely and correctly with some supervision	uses tools, equipment, and materials safely and correctly	demonstrates and promotes the safe and correct use of tools, equipment, and materials
Communication	**The Student**			
communication of information and ideas	communicates information and ideas with limited clarity and precision	communicates information and ideas with moderate clarity and precision	communicates information and ideas with considerable clarity and precision	communicates information and ideas with a high degree of clarity and precision
use of scientific terminology, symbols, conventions, and standard (SI) units	uses scientific terminology, symbols, conventions, and SI units with limited accuracy and effectiveness	uses scientific terminology, symbols, conventions, and SI units with some accuracy and effectiveness	uses scientific terminology, symbols, conventions, and SI units with considerable accuracy and effectiveness	uses scientific terminology, symbols, conventions, and SI units with a high degree of accuracy and effectiveness
Making Connections	**The Student**			
understanding of connections among science, technology, society, and the environment	shows limited understanding of connections in familiar contexts	shows some understanding of connections in familiar contexts	shows considerable understanding of connections in familiar and some unfamiliar contexts	shows thorough understanding of connections in familiar and unfamiliar contexts
analysis of social and economic issues involving science and technology	analyses social and economic issues with limited effectiveness	analyses social and economic issues with moderate effectiveness	analyses social and economic issues with considerable effectiveness	analyses complex social and economic issues with a high degree of effectiveness