Ontario eSecondary School
Course Outline
2022-2023

Ministry of Education Course Title: Gr. 11 Physics, University Preparation	
Ministry Course Code: SPH3U	
Course Type: University Preparation	
Grade: 11	
Credit Value: 1.0	
Prerequisite(s): Science, Grade 10, Academic (SNC2D)	
Department: Science	
Course developed by: **Andrew Lee**	**Created:** **June 1, 2020**
Length: **One Semester**	**Hours:** **110**
This course has been developed based on the following Ministry documents: 1. *Science, The Ontario Curriculum, Grades 11 and 12*, 2008, (revised) 2. *Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools (2010)* 3. *Learning for All (2013)*	

COURSE DESCRIPTION/RATIONALE

This course develops students' understanding of the basic concepts of physics. Students will explore kinematics, with an emphasis on linear motion; different kinds of forces; energy transformations; the properties of mechanical waves and sound; and electricity and magnetism. They will enhance their scientific investigation skills as they test laws of physics. In addition, they will analyze the interrelationships between physics and technology, and consider the impact of technological applications of physics on society and the environment.

Prerequisite(s): Science, Grade 10, Academic (SNC2D)

OVERALL CURRICULUM EXPECTATIONS

Scientific Investigation Skills and Career Exploration

- 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.

Kinematics

By the end of the course, students will:

- analyse technologies that apply concepts related to kinematics, and assess the technologies' social and environmental impact;
- investigate, in qualitative and quantitative terms, uniform and non-uniform linear motion, and solve related problems;
- demonstrate an understanding of uniform and non-uniform linear motion, in one and two dimensions.

Forces

By the end of the course, students will:

- analyse and propose improvements to technologies that apply concepts related to dynamics and Newton's laws, and assess the technologies' social and environmental impact;
- investigate, in qualitative and quantitative terms, net force, acceleration, and mass, and solve related problems;
- demonstrate an understanding of the relationship between changes in velocity and unbalanced forces in one dimension.

Work & Energy and Society

By the end of the course, students will:

- analyse technologies that apply principles of and concepts related to energy transformations, and assess the technologies' social and environmental impact;
- investigate energy transformations and the law of conservation of energy, and solve related problems;
- demonstrate an understanding of work, efficiency, power, gravitational potential energy, kinetic energy, nuclear energy, and thermal energy and its transfer (heat).

Waves & Sound

By the end of the course, students will:

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

- investigate, in qualitative and quantitative terms, the properties of mechanical waves and sound, and solve related problems;
- demonstrate an understanding of the properties of mechanical waves and sound and of the principles underlying their production, transmission, interaction, and reception.

Electricity & Magnetism
By the end of the course, students will:

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

TERM WORK EVALUATIONS (70%):

Evaluation Item	Description	Category	Weight
Unit 1: Quiz	Students will complete the quiz on Moodle.	K, A	3.5
Unit 1: Unit Test	Students will complete a Unit Test consisting of multiple choice, true and false, and short answer.	K, I, C, A	10
Unit 1: End of Unit Conversation	Students will contact their teacher to have the end of unit conversation.	K, I, C, A	0.5
Unit 2: Quiz	Students will complete the quiz on Moodle.	K, A	3.5
Unit 2: Unit Test	Students will complete a Unit Test consisting of multiple choice, true and false, and short answer.	K, I, C, A	10
Unit 2: End of Unit Conversation	Students will contact their teacher to have the end of unit conversation.	K, I, C, A	0.5
Unit 3: Assignment	Students will complete an assignment on Power Generations Plants.	K, I, C, A	3.5
Unit 3: Unit Test	Students will complete a Unit Test consisting of multiple choice, true and false, and short answer.	K, I, C, A	10
Unit 3: End of Unit Conversation	Students will contact their teacher to have the end of unit conversation.	K, I, C, A	0.5
Unit 4: Quiz	Students will complete the quiz on Moodle.	K, A	3.5
Unit 4: Unit Test	Students will complete a Unit Test consisting of multiple choice, true and false, and short answer.	K, I, C, A	10
Unit 4: End of Unit Conversation	Students will contact their teacher to have the end of unit conversation.	K, I, C, A	0.5
Unit 5: Quiz	Students will complete the quiz on Moodle.	K, A	3.5
Unit 5: Unit Test	Students will complete a Unit Test consisting of multiple choice, true and false, and short answer.	K, I, C, A	10

Unit 5: End of Unit Conversation	Students will contact their teacher to have the end of unit conversation.	K, I, C, A	0.5

FINAL EVALUATIONS (30%):

Evaluation Item	Description	Category	Weight
Culminating Activity	A video research project.	SUM	10
Final Exam	An exam to cover the major units studied through this course. This will be 3 hours in length.	SUM	20

COURSE CONTENT

Unit	*Length*
Unit 1: Kinematics	20.5 hours
Unit 2: Forces	17.5 hours
Unit 3: Energy	22.5 hours
Unit 4: Waves and Sound	18.5 hours
Unit 5: Electricity and Magnetism	21 hours
Unit 6: Review and Final Assessments	10 hours
	Total 110 Hours

AFL/AAL/AOL Tracking sheet:

Unit 1:Kinematics

AAL	AFL	AOL
-Lesson Notes -Handout Solutions -Discussion Forum Post -Test Review	-Gizmo worksheets	-Quiz -Unit Test -End of unit discussion

Unit 2: Forces

AAL	AFL	AOL
-Lesson Notes -Handout Solutions -Discussion Forum Post -Test Review	-Gizmo worksheets	-Quiz -Unit Test -End of unit discussion

Unit 3: Energy

AAL	AFL	AOL
-Lesson Notes -Handout Solutions -Discussion Forum Post -Test Review	-Gizmo worksheets	-Assignment -Unit Test -End of unit discussion

Unit 4: Waves and Sound

AAL	AFL	AOL
-Lesson Notes -Handout Solutions -Discussion Forum Post -Test Review	-Gizmo worksheets	-Quiz -Unit Test -End of unit discussion

Unit 5: Electricity and Magnetism

AAL	AFL	AOL
-Lesson Notes -Handout Solutions -Discussion Forum Post -Test Review	-Gizmo worksheets	-Quiz -Unit Test -End of unit discussion

Unit 6: Review and Final Assessments

AOL
-Culminating Activity -Final Exam

The students will experience a variety of activities:

Video presentations and technological aids with videos embedded to enrich the course content and clarify concepts and skills being studied.

Practice (formative) quizzes as a review for students with access to answers for timely feedback to help reinforce the concepts and skills being studied.

Inquiry activities that will allow students to develop/practice problem solving and critical thinking skills, as well as enrich the course content and clarify concepts and skills being studied.

Visuals and graphic organizers are a great way for students to demonstrate their knowledge of subject matter through graphic organizers, pictures, and texts.

Individual Activities

Individual activities allow the teacher to accommodate interests and needs and to access the progress of individual students. The teacher plays an important role in supporting these activities through the provision of ongoing feedback to the students, both orally and in writing. These activities include the following in the course:

Research is completed in an online environment and the use of using reliable sources/A.P.A. formatting is reinforced.

Individual assignments - the teacher can support the student in these activities with ongoing feedback.

Oral presentations are facilitated through the use of video conferencing and video recording.

Practical extension and application of knowledge helps students develop their own voice, and gives them the ability to make personal connections, and connections to the world throughout their course.

ASSESSMENT, EVALUATION, AND REPORTING

Assessment: The process of gathering information that accurately reflects how well a student is achieving the identified curriculum expectations. Teachers provide students with descriptive feedback that guides their efforts towards improved performance.

Evaluation: Assessment of Learning focuses on Evaluation which is the process of making a judgement about the quality of student work on the basis of established criteria over a limited, reasonable period of time.

Reporting: Involves communicating student achievement of the curriculum expectations and Learning Skills and Work Habits in the form of marks and comments as determined by the teacher's use of professional judgement.

STRATEGIES FOR ASSESSMENT

Assessment practices can nurture students' sense of progress and competency and information instruction. Many diagnostic tools, e.g. checklists and inventories, are used at regular intervals throughout the units to encourage students' understanding of their current status as learners and to provide frequent and timely reviews of their progress.

Teachers are encouraged to share goals with students early in the course and to connect Unit learning experiences frequently and explicitly with big ideas, overall expectations, and performance tasks.

Students are also allowed a one-page (two sided) study sheet for the course. Teachers are recommended to encourage their students to create these sheets as a way of preparing for the tests.

ASSESSMENT ACTIVITIES

- ❑ Virtual lab assignments
- ❑ Practice (formative) worksheets
- ❑ Oral presentations
- ❑ Research projects
- ❑ Inquiry Assignments
- ❑ Tests & Exam

EVALUATION

The final grade will be determined as follows:

- ❑ Seventy percent of the grade will be based on evaluation conducted throughout the course. This portion of the grade should reflect the student's most consistent level of achievement throughout the course, although special consideration will be given to more recent evidence of achievement.
- ❑ Thirty percent of the grade will be based on a final evaluation administered at or towards the end of the course. This evaluation will be based on evidence from a combination of the following: an examination and a performance task, an essay, and/or another method of evaluation suitable to the course content. The final evaluation allows the student an opportunity to demonstrate comprehensive achievement of the overall expectations for the course.

  (*Growing Success: Assessment, Evaluation and Reporting in Ontario Schools*. Ontario Ministry of Education Publication, 2010 p.41)

Weightings	
Course Work	**70**
Knowledge/Understanding	17.5
Thinking/Inquiry	17.5
Communication	17.5
Application	17.5
Final	**30**
Performance Task	10
Final Exam	20