Subject Name & Course Code: Grade 12 University Physics SPH4U	**Teacher Name:** A. Fong
Prerequisite: Grade 11 University Physics SPH3U	**Teacher Website:** Google Classroom / Fongphysics.com

The Woodlands School
Course Outline

Course Description:
This course enables students to deepen their understanding of the concepts and theories of physics. Students will explore further the laws of dynamics and energy transformations, and will investigate electrical, gravitational, and magnetic fields; electromagnetic radiation; and the interface between energy and matter. They will further develop inquiry skills, learning, for example, how the interpretation of experimental data can provide indirect evidence to support the development of a scientific model. Students will also consider the impact on society and the environment of technological applications of physics.

Course Units & Learning Goals

Unit	Learning Goals / Big Ideas	Assessment s
Dynamics	• Forces affect motion in predictable and quantifiable ways. • Forces acting on an object will determine the motion of that object. • Many technologies that utilize the principles of dynamics have societal and environmental implications.	Tests, Quizzes, Assignments, Research projects, labs, presentations, written reports, essays, notebooks, graphing, case studies, making models, observations, discussions, reflections, blogs, computer simulations, debates
Energy & Momentum	• Energy and momentum are conserved in all interactions. • Interactions involving the laws of conservation of energy and conservation of momentum can be analyzed mathematically. • Technological applications that involve energy and momentum can affect society and the environment in positive and negative ways.	
Gravitational, Electrical, & Magnetic Fields	• Gravitational, electric, and magnetic forces act on matter from a distance. • Gravitational, electric, and magnetic fields share many similar properties. • The behaviour of matter in gravitational, electric, and magnetic fields can be described mathematically. • Technological systems that involve gravitational, electric, and magnetic fields can have an effect on society and the environment.	
The Wave Nature of Light	• Light has properties that are similar to the properties of mechanical waves. • The behaviour of light as a wave can be described mathematically. • Technologies that use the principles of the wave nature of light can have societal and environmental implications.	
Modern Physics	• Light can show particle-like and wave-like behaviour, and particles can show wavelike behaviour. • The behaviour of light as a particle and the behaviour of particles as waves can be described mathematically. • Time is relative to a person's frame of reference. • The effects of relativistic motion can be described mathematically. • New theories can change scientific thought and lead to the development of new technologies.	

Final Evaluation(s)
Exam
Summative task: Personal Physics Project

Assessment & Evaluation

Assessments and evaluations are based on the provincial expectations and levels of achievement outlined in the provincial curriculum document for each subject in secondary school. A wide range of assessment and evaluation opportunities allows students to demonstrate their learning in a variety of ways. The final grade will be determined as follows:

- **Seventy percent** of the grade will be based on evaluation conducted throughout the course;
- **Thirty percent** of the grade will be based on final evaluations administered at or towards the end of the course.

Evidence of Learning

Products, Conversations and Observations inform Final Grade

Knowledge & Understanding 20%	Thinking & Investigation 20%	Communication 10%	Application 20%
Knowledge and understanding of content.	Use of initiating and planning skills and strategies; use of processing skills and strategies; use of critical thinking processes, skills and strategies.	Expression and organization of ideas and information; communication for different audiences and purposes; use of conventions, vocabulary and terminology of the discipline in oral, visual and or written forms	Application of knowledge and skills; transfer of knowledge and skills; making connections between science, technology, society and the environment; proposing courses of practical action to deal with problems relating to STSE

Learning Skills

The following learning skills will be taught throughout the course and will be shown on the report card. Student performance in these skill areas will not be included in the final numeric mark. It is important to remember, however, that the development and consistent practice of these skills will influence academic achievement. These skills include:

E – Excellent	G – Good	S – Satisfactory	N – Needs Improvement

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

Missed Assessments

1. Students who know ahead of time that they will miss an assessment are expected to discuss the situation beforehand with the subject teacher and any group peers that may be affected.
2. Students who miss an in-class summative assessment for an unauthorized reason may lose the opportunity to complete the task.
3. Students who are absent on the day of an assessment for reasons such as illness, field trip, or suspension, are responsible for meeting with the subject teacher to make alternative arrangements to submit/ complete the assessment.
4. Failure to complete compulsory major assessments, including the final assessment, may result in loss of credit.

Deadlines

Deadlines are realistic in the normal working life outside the school setting. At appropriate times throughout the school year (e.g., at the beginning of the term, when an assignment is given, etc.), teachers will communicate deadlines and the consequences for not completing assignments for evaluation or for submitting those assignments late.

1. Seek assistance from the subject teacher when they feel unable to complete a task/assignment due to insufficient knowledge or skill. Be sure to advise the subject teacher of any difficulty well before a task/assignment is due.
2. Negotiate alternate deadlines well before an established due date.
3. Understand that chronic lateness in submitting tasks/assignments could result in insufficient evidence of learning, and may require him/her to demonstrate his/her knowledge and skills by an alternate manner to successfully achieve his/her credit.

Cheating, Academic Integrity, Plagiarism

Students are expected to demonstrate INTEGRITY and submit assignments that are their own work. Cheating is defined as completing an assignment in a dishonest way through improper access to the answers.

Plagiarism is submitting someone else's words, images, data, and/or ideas as your own original work. Examples include but are not limited to: copying another's project (portions or whole) and copying/paraphrasing parts of a book, website or article without proper reference or citation method as defined by the subject teacher.

If an evaluation is plagiarized, students will:

- Attend a teacher-student interview to determine circumstances of plagiarism;
- Following investigation by the teacher and/or administration, student will accept consequences determined by the investigation;
- Be made aware that any incidents of confirmed plagiarism will be documented by the administration.

Levels of achievement

Anchor marks are designated marks for each level of achievement assigned to students during reporting cycles based on evidence of learning from observations, conversations and student products. They support criterion-referenced assessment. Anchor marks are not true midpoints in the mathematical sense. Teachers still use both mathematical calculations and professional judgment to arrive at an anchor mark, combined with the principle of most consistent achievement with special consideration for more recent evidence.

Achievement Level	Anchor Mark
4++	100
4+	98
4	91
4-	84
3+	78
3	75
3-	71
2+	68
2	65
2-	61
1+	58
1	55
1-	51
R	45

THE WOODLANDS SCHOOL

***Discriminatory slurs and statements have no place in our learning environment*.**
Building Classroom Goals and addressing discriminatory statements

Discriminatory statements are any derogatory word or slur, comment or image that connects to a code ground. These code grounds are detailed on the Ontario Human Rights Commission's website. They include age, ancestry, colour, race, family status, citizenship, gender identity, gender expression, ethnic origin, place of origin, receipt of public assistance, creed, sex, sexual orientation and disability.

Human Rights Policy 51 outlines a responsibility that immediate intervention is taken to ensure that all members of the PDSB rights are not infringed upon.

If a discriminatory statement is made in the classroom or outside the classroom the following steps will be taken:

- Interruption and Disruption
- Reporting
- Restoring
- Investigation
- Outcomes and Communication

The intent of these steps are to ensure that our school is free of discrimination. This school wide approach will be reflective of care, kindness, humility, empathy, community, accountability,learning and restoration.

Students and Parents:
Please fill out this electronic form to show that you are aware of the expectations of this course. Students will be asked to refer to this document when necessary.