Sir Wilfrid Laurier Secondary School
Grade 12 University Physics – SPH4U credits

Course Description

This course enables students to deepen their understanding of physics through the study of kinematics, dynamics, and energy transformations; gravitational, electrical, and magnetic fields; electromagnetic radiation, and the interface between energy and matter. Students will further develop problem-solving and laboratory skills, at the same time refining their ability to analyze experimental data and communicate scientific information. Emphasis will be placed on the importance of physics in daily life, and on evaluating the impact of technology on the environment and society.

Strands and Subgroups

Motion and Dynamics • frames of reference and relative motion • projectiles • uniform circular motion • Newton's laws of motion • gravitational forces and fields • strings and pulleys • frictional forces • centripetal acceleration and force • Law of universal gravitation	**Waves and Light** • properties of waves • analysis of wave interference in 2-D • Young's experiment • colour and wavelength • wave/particle nature of light • interference effects
Momentum and Energy • momentum and impulse • conservation of momentum • work and kinetic energy • gravitational potential • elastic and non-elastic collisions • Hooke's law	**Modern Physics** • electromagnetic waves • Planck's hypothesis and quantum theory • photoelectric effect • Compton effect • wave nature of matter • Einstein and relativity • matter-energy interface • standard model of elementary particles
Gravitational, Electric, and Magnetic Fields • gravitational fields • electric charges • Coulomb's law and electric forces • electric fields and potential • motion of charged particles in fields • magnetism and magnetic fields • magnetic forces on charges and conductors • Ampere's law	

Evaluation

The final report card mark will be determined as follows:

Term Work – 70%	Summative – 30%
Consisting of unit tests, lab activities, projects, presentations, and/or other class assignments.	Exam and/or Summative Task(s)

Attendance & Missed Evaluations

Regular attendance is an integral part of learning. Students are responsible for completing all work missed due to absence. Students must complete missed evaluations immediately upon return to school, during out-of-class time.

If a student is absent the day an experiment is performed, **it is his/her responsibility** to make arrangements to perform the experiment before materials and equipment are put away – this will likely be outside normal class time.

Formal lab reports are time-sensitive assignments. The finished report may be used during any lab-based quiz (usually given on the due date). If the finished report is not submitted by the time marked reports are returned, a mark of zero will be given.

End-of-course evaluations, i.e. the summative activity and final examination, are **time-sensitive**. Attendance is mandatory for these evaluations. Any absence will result in a mark of zero, unless validated by a doctor's certificate.

If a student participates in **academic fraud** (e.g. plagiarism on assignments, lab reports, etc.), he / she is deemed not to have met the expectations associated with that particular evaluation.

General Course Information

Students must bring the following materials to each class:

- lined paper
- **scientific calculator**
- separate Physics binder (to hold notes, tests, quizzes, handouts)
- pencil case (to hold pencils, erasers, ruler)

Course Text:**Physics 12**, Thomson-Nelson ($118.00, GST included).
The student will be issued a text, and will be responsible for the cost of replacement, or repair, if the text is lost or damaged.
