

Physics 30 Course Outline

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Welcome to Physics 30!

Physics is the branch of science that deals with matter, energy, motion and force.

This document is a useful roadmap for Physics 30, and I recognize that COVID still impacts our lives in often unforeseen ways and finding a balance between flexibility and returning to an at-school environment is a priority. Parents can email, and students can chat through Microsoft Teams for a faster response.

Course Format

This course is delivered with a blend of direct instruction, collaborative problem solving, formative practice work, and labs.

Formative problem work ("practice problems") are assigned and students are **expected** to use all available class time to complete it, although it does not generate any **immediate** marks. Students are to self-check their own progress with the solutions. During formative time, students should be seeking assistance and clarification from the teacher. This formative time is vital to success in the course.

Quizzes/assignments will be scheduled to help students stay on top of the course material. Labs will allow students to demonstrate skill competencies outlined by the program of studies.

The pace and intensity of this course requires regular attendance and consistent effort.

Tentative Year Plan for Physics 30

# of classes	Unit	General outcomes	Key Concepts
14	Momentum and Impulse	1.) Explain how momentum is conserved when objects interact in an isolated system.	<ul style="list-style-type: none">• Impulse• Momentum• Newton's law of motion• Elastic collision• Inelastic collision
26	Forces and Fields	1.) Explain the behaviour of electric charges, using the laws that govern electrical interactions. 2.) Describe electrical phenomena, using the electric field theory. 3.) Explain how the properties of electric and magnetic fields are applied in numerous devices.	<ul style="list-style-type: none">• Electric charge• Conservation of charge• Coulomb's Law• Vector fields• Electric and magnetic fields• Electric potential difference• Interaction of charges with electric and magnetic fields• Charge quantization – Millikan's experiment• Electromagnetic induction
24	Electromagnetic Radiation	1.) Explain the nature and behaviour of EMR, using the wave model. 2.) Explain the photoelectric effect, using the quantum model.	<ul style="list-style-type: none">• Speed of EMR• Propagation of EMR• Reflection• Refraction• Diffraction• Interference

			<ul style="list-style-type: none"> • Snell's law • Total internal reflection • Photoelectric effect • Compton effect
12	Atomic Physics	1.) Describe the electrical nature of the atom. 2.) Describe quantization of energy in atoms and nuclei. 3.) Describe nuclear fission and fusion as powerful energy sources in nature. 4.) Describe the ongoing development of models of the structure of matter.	<ul style="list-style-type: none"> • Charge-to-mass ratio (Thomson's experiment) • Classical model of the atom (Rutherford, Bohr) • Spectra: continuous, line emission and line absorption • Energy levels (states) • De Broglie hypothesis • Quantum mechanical model • Half-life • Nuclear decay • Nuclear reactions • Standard Model of matter

Evaluation

Course Mark	70 %		
Outcomes	50%		
Unit 1 Unit Exam	6%	Unit 3 Unit Exam	13%
Unit 2 Unit Exam	13%	Unit 4 Unit Exam	8%
Lab Skill Competencies	20%	Cumulative Assessments	10%
Diploma	30%		

***All weights (with exception to the diploma) may be subject to change. ***

Course Materials/Textbook

Physics 30 Textbook Replacement Cost: \$124.94

SNAP 30 Workbook Cost: \$33*	Graphing Calculator**	Ruler
Graph Paper Lab Notebook	Pencil/Pens	Protractor
Graph Paper and Lined Paper	Ruler	

* Formative problem work is assigned from the SNAP 30 workbook. The fee is \$33.00 and payable through the schoolcash system. Alternatively, the workbook can be rented from the library with no fee, provided the workbook is returned in good condition at the end of the year and not written in.

**While it is possible to complete most problems with a scientific calculator, a graphing calculator with linear regression is extremely beneficial for lab situations.

Calculator Policy

It is the student's responsibility to have an appropriate calculator for tests, quizzes, and assignments.

- Calculators may be used for exams and quizzes but may not be shared.
- Calculators may not be lent out to students by their teacher.
- No information, text, or formulas may be stored in electronic form.
- Calculators may be cleared before quizzes, exams, and the final exam.

Assignment/Test Expectations

There is no deduction for late assignments/labs, but when an assignment/lab is handed back to the class they are no longer accepted. Assignments/labs not handed in will be given a zero or substituted with

suitable formative quiz grades if available. However, all assignments/labs that are overdue can be completed for marks during FLEX blocks on Friday. Special circumstances will be handled individually.

A deferred assessment on a test/unit exam may be given to students only when exceptional circumstances prevent the student from writing at the scheduled time. Advance notice must be provided whenever possible. **It is up to the student to make arrangements to write the test/exam as soon as possible upon returning to school.**

Missed Classes

For students who have or will be missing class for various reasons are expected to be responsible for the work and lessons covered in class via another student or accessing the course material online on Microsoft Teams.

If a student has missed an assignment or lab due to an excused absence, then that student will be given the assignment or lab data and permitted to hand in the assignment/lab for marking without penalty at the teacher's discretion.

Lab Safety

- The student is responsible for conducting him/herself with all necessary caution and due care while conducting experiments. Adherence to the safety rules is mandatory. If students do not follow the safety rules, they will be asked to stop and clean up their experiment without completion of the experiment.
- Performing unauthorized experiments is not allowed.
- Lab equipment and work area must be cleaned after finishing work. All equipment has to be returned to the place it was taken and in the shape it was taken.

Appeals

Students and parents may direct, in writing, any appeal of the final grade to the school Principal.
