

TAKE PRIDE

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FIND YOUR POTENTIAL

LETHBRIDGE COLLEGIATE INSTITUTE

Physics 30 Course outline

The Physics 30 program deals with 4 foundations:

Attitudes:

Students will be encouraged to develop attitudes that support the responsible acquisition and application of scientific and technological knowledge to the mutual benefit of self, society, and the environment.

Knowledge:

Students will construct knowledge and understandings of concepts in life science, physical science, and Earth and space science, and apply these understandings to interpret, integrate, and extend their knowledge.

Science, Technology, and Society (STS):

Students will develop an understanding of the nature of science and technology, the relationships between science and technology, and the social and environmental contexts of science and technology.

Skills:

Students will develop the skills required for scientific and technological inquiry, for solving problems, for communicating scientific ideas and results, for working collaboratively and for making informed decisions.

These 4 foundations are developed throughout the course as the following 4 units are covered:

Unit 1: Momentum and Impulse covers the themes of change and systems. In this unit, students link Newton's 2nd law of motion to concepts of momentum and Impulse. **Key concepts covered include** impulse, momentum, Newton's laws of motion, and elastic and inelastic collisions.

Unit 2: Forces and Fields covers the themes of Energy and Matter. In this unit, students investigate electric and magnetic forces and fields and their applications in technological devices. **Key concepts covered include** electric charge, conservation of charge, Coulomb's law, vector fields, electric field, magnetic field, electric potential difference, interaction of charges with electric and magnetic fields, charge quantization—Millikan's experiment and electromagnetic induction

Unit 3: Electromagnetic Radiation covers the themes of Diversity and Matter. In this unit, students study the nature and characteristics of electromagnetic radiation (EMR), using the wave and photon models of light. **Key concepts covered include** speed of EMR, propagation of EMR, reflection, refraction, diffraction, interference, total internal reflection, Snell's law, photoelectric effect and the Compton Effect.

Unit 4: Atomic Physics covers the themes of Energy and Matter. In this unit, students study the development and modification of models of the structure of matter. **Key concepts covered include** 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, and the Standard Model of matter.

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Course Assessment and Evaluation

Evaluation will consist of a balance between **Formative** and **Summative** assessment.

Formative assessment is assessment “*for*” learning. Tools used for this type of assessment generally address one or two learning objectives and include various types of activities, including (but not limited to) assignments, worksheets, homework, group work, games, or other classroom activities. This allows teachers to track student progress as well as to see and address areas of strength and weakness of particular students and the class as a whole. It allows students to gain practice in a particular area in order to really learn the material before the summative assessment without fear or worry of the assignment affecting their overall course grade.

Summative assessment is considered assessment “*of*” learning. Tools used for this type of evaluation address several learning objectives simultaneously and will include the final exam, unit exams, labs and projects.

Students cannot be successful on summative evaluation if they have not completed the formative assessment!

To make an analogy: *You cannot swim across the English Channel without training and practice!*

Course Evaluation:

Class Work: 50%

Diploma Exam: 50%

Class Work Breakdown:

Individual Performance Tasks: 40%

Unit Exams: 60%

Unit 1: Momentum and Impulse	3 weeks	15%
Unit 2: Forces and Fields	5 weeks	30%
Unit 3: Electromagnetic Radiation	5 weeks	30%
Unit 4: Atomic Physics	4 weeks	25%

Resources:

Text: Physics, Pearson

Physics 30 Notes and Problems

Locally developed materials