

TAKE PRIDE

BE RESPONSIBLE

FIND YOUR POTENTIAL

LETHBRIDGE COLLEGIATE INSTITUTE

Physics 20 Course Outline

The Physics 20 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: Kinematics covers the themes of Change and Systems. Students investigate changes in the position and velocity of objects and systems. **Key concepts covered include** scalar quantities, vector quantities, uniform motion, uniformly accelerated motion, and two-dimensional motion.

Unit 2: Dynamics covers the themes of Change and Systems. Students investigate causes of change in position and velocity of objects and systems in a study of dynamics and gravitation. The concept of fields is introduced in the explanation of gravitational effects. **Key concepts covered include** Newton's laws of motion, inertia, vector addition, static and kinetic friction, gravitational force, Newton's law of universal gravitation, and gravitational fields.

Unit 3: Circular Motion, Work and Energy covers the themes of Energy and Equilibrium. Students extend their study of kinematics and dynamics to uniform circular motion and to mechanical energy, work, and power. **Key concepts covered include** uniform circular motion, planetary and satellite motion, Kepler's laws, mechanical energy, conservation of mechanical energy, work-energy theorem, isolated systems, and power.

Unit 4: Oscillatory Motion and Mechanical Waves covers the themes of Energy and Matter. Students investigate simple harmonic motion and mechanical waves. **Key concepts covered include** oscillatory motion, simple harmonic motion, restoring force, oscillating spring and pendulum, mechanical resonance, mechanical waves-transverse and longitudinal, universal wave equation, reflection, interference, acoustic resonance, and the Doppler effect.

Physics 20 provides a foundation for work in Physics 30.

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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:

Individual Performance Tasks: 28%

Unit Exams: 42%

Unit Exam Breakdown:

Unit 1: Kinematics	4 weeks	23%
Unit 2: Dynamics	4 weeks	23%
Unit 3: Circular Motion, work, energy	5 weeks	27%
Unit 4: Oscillatory Motion and Mechanical Waves	5 weeks	27%

Final Exam: 30%

Resources:

Text: Physics, Pearson

Physics 20 Notes and Problems, Wayne Ladner

Locally developed materials