

**PHYS 030A, Physics 030**

*5 credits, 6 hours lecture, 2 hours lab on alternate weeks*

A review of Physics 025, followed by the study of electric and magnetic fields, electromagnetic radiation, and conservation of energy.

Alberta Education Course Equivalency: Physics 30

*Prerequisite: PHYS 025 or equivalent or permission from Program Chair.*

**Instructor**

Leni Cherian  
CC 205 T  
791-4835  
leni.cherian@keyano.ca

**Office Hours**

Monday	12:00 – 12:50 pm
Tuesday	10:00 – 10:50 am
Wednesday	10:00 - 11:50 am
Thursday	12:00 - 12:50 pm

**Hours of Instruction**

Tuesday	8:00- 9:50 am	CC235
Wednesday	1:00 – 2:50 pm	CC237
Friday	1:00 – 2:50 pm	CC235
Lab Thursday	10:00-11:50 am	CC239

**Required materials**

Key Study Guide- 2013 Alberta Edition: Castle Rock  
ISBN 978-1-77044-214-6

Physics 30 Notes and Problems and Solution Manual:  
Castle Rock ISBN 1-55371-109-2  
Scientific Calculator  
Text Book: Pearson Physics  
ISBN 978-0-32130813-9

**Course Outcomes**

Upon successful completion of Physics 30, students will be able to:

**Momentum and Impulse**

- Define momentum as a vector quantity
- Explain impulse and momentum using Newton's laws of motion
- Explain that momentum is conserved in an isolated system
- Compare and contrast elastic and inelastic collisions
- Analyze law of conservation of momentum as applied to one dimension and two dimension interactions

**Electric Forces and Electric fields**

- Explain electric charge and Coulombs law
- Explain the behaviour of electric charges, using the laws that govern electrical interactions
- Explain the different charging methods, Use Coulomb's law to calculate the electric force on a point charge due to a second point charge
- Determine the magnitude and direction of electric force on a point charge due to one or more stationary point charges in a plane
- Define vector fields
- Determine the magnitude and direction of electric field at any point due to one or more stationary point charges in a plane
- Define electric potential difference as a change in potential energy per unit charge
- Define uniform electric field and calculate the electric field between two parallel charged plates.
- Define electric current as the amount of charge passing a reference point per unit time
- Define Ohm's law and simple problems

**Magnetic Forces and Fields**

- Explain magnetic field around a current carrying conductor and solenoid
- Explain left hand rules
- Effect of an external magnetic field on a current carrying conductor
- Explain the interaction between an external magnetic field and a moving charge
- Effect of moving a conductor in an external magnetic field
- Principle of ac generators and transformers

**Electromagnetic Radiation**

- Explain the nature and behaviour of EMR, using the wave model.
- Explain the photoelectric effect, using the quantum model.

## Atomic Physics

- Describe the electrical nature of the atom
- Describe the quantization of energy in atoms and nuclei
- Describe nuclear fission and fusion as powerful energy sources in nature

**Evaluation:**

Unit Assignments	10%
Unit Tests	35%
Laboratory	15%
Final exam	40%

*The minimum pre-requisite for progression is 1.7 (refer to Grading System below)*

**Grading System**

<b>Descriptor</b>	<b>4.0 Scale</b>	<b>Percent</b>
Excellent	4.0	96 – 100
	4.0	90 – 95
	3.7	85 – 89
Good	3.3	81 – 84
	3.0	77 – 80
	2.7	73 – 76
Satisfactory	2.3	69 – 72
	2.0	65 – 68
	<b>Minimum Prerequisite</b>	1.7
Poor	1.3	55 – 59
Minimum Pass	1.0	50 – 54
Failure	0.0	0 – 49

**Topic Outline**

Units	Assignments/Tests
<b>Law of Conservation of Momentum</b> Momentum Impulse Elastic and Inelastic Collisions One Dimensional Interactions Two Dimensional Interactions	Assignments -2 Test 1
<b>Electric Forces and Fields</b> Charge, Charging Methods Coulomb's Law Non Uniform Electric field Uniform Electric field Work, Electric potential Current, Ohms Law. Power, Energy Series and Parallel Circuits	Assignments-3 Test -2
<b>Magnetic Forces and Fields</b> Magnetic Field around a current carrying Conductor Magnetic field in a solenoid Force on a current carrying conductor Electromagnetic induction Generators Transformers <b>Electromagnetic radiation</b> Electromagnetic Spectrum Photo Electric Effect	Assignments -1 Test 3
<b>Atomic Physics</b> Spectrum of atoms Hydrogen spectrum Bohr Model of Atoms Radioactivity Fission, Fusion	Assignments -1

**Please Note:**

Date and time allotted to each topic is subject to change.

## Performance Requirements

### Student Responsibilities

It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College Credit Calendar.

### Laboratory Safety

In the science laboratories, safety is important.

Students must complete the *WHMIS for Students* online training course on Moodle before entering the science laboratories.

Students must comply with the mandatory laboratory safety rules for this course as provided in the laboratory manual. Failure to do so will result in progressive discipline such as a verbal warning, refused entry into the laboratory, or suspension from the College.

### Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a student's learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and / or notes that may be due.

### Academic Misconduct

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person
- Handing in the same unchanged work as submitted for another assignment
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, you must successfully complete the online tutorial found on [ilearn.keyano.ca](http://ilearn.keyano.ca). Then print the certificate, sign it, and show it to each of your instructors. Your course work will not be graded until you show this signed certificate

### **Specialized Supports**

#### **Counselling and Disability Services**

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

#### **SKILL Centre**

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

**Authorization**

This course outline has been reviewed and approved by the Program Chair.

---

Leni Cherian, Instructor

---

Lisa Turner, Chair

Date Authorized

---

Guy Harmer, Dean

Date Authorized