

**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 the Program Chair.*

**Instructor**

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

**Office Hours**

Monday	2:00 – 2:50 pm
Tuesday	1:00 – 2:50 pm
Thursday	1:00 - 2:50 pm

**Hours of Instruction**

Wednesday	9:00- 10:50 am	Room S218
Thursday	9:00 – 10:50 am	Room S218
Friday	10:00 – 11:50 am	Room S 218
Lab Wednesday	2:00- 3:50 pm	Room 239

**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 the course, the student shall 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 behavior 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
- Explain the effect of an external magnetic field on a current carrying conductor
- Explain the interaction between an external magnetic field and a moving charge
- Explain the effect of moving a conductor in an external magnetic field
- Describe the principle of ac generators and transformers

#### Electromagnetic Radiation

- Explain the nature and behavior 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	15%
Unit Tests	35%
Laboratory	10%
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>
	4.0	96 – 100
Excellent	4.0	90 – 95
	3.7	85 – 89
	3.3	81 – 84
Good	3.0	77 – 80
	2.7	73 – 76
	2.3	69 – 72
Satisfactory	2.0	65 – 68
<b>Minimum Prerequisite</b>	1.7	60 – 64
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

## 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.

### 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**

The Student Academic Support Services (SASS) department: Accessibility Services, Skill Centre and Wellness Services, work together to support student success at Keyano College.

**Accessibility Services (CC167)** supports student success through group and individualized instruction of learning, study and test taking strategies, and adaptive technologies. Students with documented disabilities, or who suspect a disability, can meet with the Learning Strategists to discuss accommodation of the learning barriers that they may be experiencing. Students who have accessed accommodations in the past are encouraged to visit our office at their earliest opportunity to discuss the availability of accommodations in their current courses. Individual appointments can be made by calling 780-791-8934

**Skill Centre (CC119)** provides a learning space where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff. Students visiting the centre have access to one-to-one or group tutoring, facilitated study groups, and assistance in academic writing. The Skill Centre's Peer Tutor program provides paid employment opportunities for students who have demonstrated academic success and want to share what they have learned. Tutoring is available free to any students registered at Keyano College on a drop in basis, from 9:00 am to 5:00 pm Monday through Friday. Additional evening hours are subject to tutor availability and are posted in the Skill Centre.

**Wellness Services (CC260)** offers a caring, inclusive, and respectful environment where students can access free group and individual support to meet academic and life challenges. Mental Health Coordinators offer a safe and confidential environment to seek help with personal concerns. The Mindfulness Room in CC260 is available as a quiet space for students to relax during regular office hours. Wellness Service welcomes students to participate in any of the group sessions offered throughout the academic year addressing such topics as Mindfulness and Text Anxiety. Individual appointments can be made by calling 780-791-8934.

**Please watch your Keyano email for workshop announcements from our Student Academic Support Services team.**