

PHYS 025, Physics 025*6 credits, 6 hours lecture*

Main topics include triangle trigonometry, vector and vector diagrams, space body diagrams, relative velocity, uniform acceleration, Newton's Three Laws, inclined planes, pulley systems, friction, work, power, energy, circular motion, interaction between bodies, and an introduction to waves.

Alberta Education Course Equivalency: Science 10 (Physics unit) and Physics 20

Prerequisite: Math 10C or equivalent or permission from Program Chair.

Instructor

Leni Cherian

CC205T

780-791-4835

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Monday 2:00 to 2:50 pm

Tuesday 11:00 to 11:50 am

Wednesday 11:00 to 12:50pm

Thursday 11:00 to 11:50 am

Hours of Instruction

Tuesday 9:00 – 10:50 am Room CC233

Thursday 9:00 – 10:50 am Room CC233

Friday 10:00 - 11:50 am Room CC233

Required Resources**Physics 20 “Notes and Problems”****Scientific calculator****Ruler****Graph paper****Course Outcomes**

Upon successful completion of the course, the student shall be able to:

Math Review

- Identify the number of significant digits in the given data.
- Round the number to the required number of significant digits.
- Apply the rules of addition/subtraction and multiplication /division.
- Represent the number in scientific notation with the correct number of significant digits.

- Apply factor unit method in conversion of units within SI system and from SI to imperial system.
- Isolation of a variable in the given equation.
- Solve a right triangle.

Vectors

- Define Vectors and Scalars.
- Compare and contrast scalar and vector quantities.
- Represent a vector in RCS and using 'of' notation.
- Determine the horizontal and vertical components of a vector.
- Perform addition of vectors using tail to tip method and component method.
- Calculating Average Speed and Average Velocity.
- Interpret the motion of one object relative to another.
- Solving relative velocity problems.

Kinematics

- Define speed, distance, position, displacement, velocity and acceleration
- Define and analyze uniform motion and uniform accelerated motion
- Explain a two dimensional motion and analysis
- Analysis of freely falling objects
- Analysis of objects thrown upwards, downwards and dropped
- Analysis of projectiles thrown horizontally and thrown at an angle

Dynamics

- Explain Newton's laws of motion
- Explain that a non-zero net force causes a change in velocity and analysis
- Apply the laws to solve motion problems
- Explain Free Body diagram of objects on a horizontal surface and on an incline
- Describe work as transfer of energy
- Solve Work, Power, Potential energy and Kinetic energy problems
- Explain law of conservation of mechanical energy and solve related problems
- Explain work - energy theorem for net force and solve related problems

Circular motion & Universal Gravitation

- Define uniform circular motion.
- Solve speed, centripetal acceleration, centripetal force of objects in a circular path.
- Explain and apply Newton's Universal law of gravitation.

Evaluation

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|------------------|------|
| Unit Assignments | 10% |
| Mid Term 1 | 25% |
| Mid Term 2 | 25% |
| Final Exam | 40% |
| Total | 100% |

The minimum pre-requisite for progression is 1.7 (refer to grading system below)

Grading System

| Descriptor | 4.0 Scale | Percent |
|-----------------------------|------------------|----------------|
| | 4.0 | 96 – 100 |
| Excellent | 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 |
| Minimum Prerequisite | 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 |
|--|-----------------------|
| <p><u>Math Review</u></p> <ul style="list-style-type: none"> • Significant digits & rounding • Scientific notation • Measurements & SI • Unit conversion • Geometry & trigonometry • Equations & constants • Graphing techniques | Assignment- 1 |
| <p><u>Vectors</u></p> <ul style="list-style-type: none"> • Addition & subtraction • Vectors as compass directions • Horizontal & vertical components • Word problems | Assignment - 2 |
| <p><u>Kinematics</u></p> <ul style="list-style-type: none"> • Motion & graphing • Basic formulas • Uniform acceleration • Freely falling objects • Kinematics in one & two dimension • Projectile motion | Assignments 3 and 4 |
| <p><u>Dynamics</u></p> <ul style="list-style-type: none"> • Introduction • Net force • Newton's second law • weight • Newton's third law • Tension in pulley systems • Friction • Forces at angles • Inclined planes • Work, power & energy | Assignments 5 and 6 |
| <p><u>Circular motion & Universal Gravitation</u></p> <ul style="list-style-type: none"> • Uniform circular motion • Banking of curves • Vertical circular motion • Universal gravitation • Acceleration of gravity • Orbits | Assignment 7 |

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.

More specific 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.

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. 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 Accessibility 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

Vincella Thompson, Dean

Date Authorized