

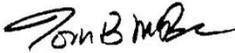


**COURSE OUTLINE**

**PHYSICS 060**

**Principle of Physics**

**98 HOURS  
3 CREDITS**

PREPARED BY:  DATE: September 13, 2012  
Tom McBee, Instructor

APPROVED BY:  DATE: September 18, 2012  
Robert Ferro , Acting Dean

**YUKON COLLEGE**

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Course Outline prepared by Tom McBee, January 6, 2014.

Yukon College  
P.O. Box 2799  
Whitehorse, YT  
Y1A 5K4

## Principle of Physics

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**INSTRUCTOR:** Tom McBee  
**OFFICE HOURS:** TBA  
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**FAX:** (867) 668-8828

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**COURSE OFFERING** January 6, 2014 to April 24, 2013  
**DAYS & TIMES:** Lectures: Mondays 12:00 noon to 1:00 p.m.  
Tuesday, and Thursday, 2:30 p.m. to 4:00 p.m.  
Friday 1:00 p.m. to 2:30 p.m.  
Labs: Friday 1:00 p.m. to 4:00 p.m.  
**LOCATIONS:** Lectures: Monday, Tuesday and Thursday A2204  
Friday A2603  
Labs: A2803

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### COURSE DESCRIPTION

College Preparation Physics 060 will allow students to take Physics 101 at Yukon College, or an university level Physics course offered at colleges and universities. The content of the course includes: kinematics and dynamics in two dimensions including force, energy, momentum, and circular motion, electrostatics and electromagnetism, waves, light and optics.

## **LEARNING OUTCOMES:**

Upon completion of Physics 060, students will be able to:

- Meet the competencies as stated for ABE Advanced Level Physics located in the ABE in BC Articulation Handbook <http://www.aved.gov.bc.ca/abe/docs/handbook.pdf>
- Obtain the prerequisite body of knowledge and skills that will provide a basis for further academic and career/vocational training
- Appreciate and apply the physics of everyday life
- Appreciate and apply the scientific method to investigations of all phenomena
- Communicate effectively, particularly to the scientific community using the language of physics and mathematics.
- Carry out all duties in an ethical, professional manner, including the collection of data.
- Work effectively as a member of a team.
- Handle equipment in a safe and effective manner with regard to their own safety and the safety of others.

## **DELIVERY METHODS/FORMAT:**

This class is offered by lecture format at Ayamdigut Campus only. Approximately half the Friday classes will be labs from 1:00 p.m. until completion on or before 4:00 p.m; the remaining Fridays will be regular classes from 1:00 a.m. until 2:30 p.m. A schedule with labs times will be made available.

## **PREREQUISITES:**

High school Physics grade 11 with a minimum grade of 65% or Yukon College Physics 050 with a minimum grade of 65%. High school Mathematics grade 11 with a minimum grade of 65% or Yukon College Mathematics 050 with a minimum grade of 65% is also required.

## **COURSE REQUIREMENTS/EVALUATION:**

### **Attendance and Participation**

It is the student's responsibility to attend classes. Students who miss classes are responsible for any work missed.

## Assignments

There are eleven assignments to be completed. There will be 10% deducted for late assignments unless prior permission has been received from the instructor. It is the students' responsibility to attend class. Late assignments will receive deductions regardless of absences. A student planning to be away on the due date must submit the assignment prior to leaving. . Assignments will usually be returned the class following the due date. Once assignments have been returned to the class, they will no longer be accepted. If the due date is missed owing to an emergency, an alternate assignment may be given.

## Labs

There are seven labs in the course. Each of the seven labs requires a detailed lab report due one week after the lab session. The collection of data must be done in the laboratory or classroom; the calculations and write-up can be done at home, therefore students must attend the lab session in order to submit a report. For this reason, consult the schedule and make any necessary arrangements. There will be 10% deducted for late reports unless prior permission has been received from the instructor. It is the students' responsibility to attend class. Late reports will receive deductions regardless of absences. Reports will usually be returned the class after the due date. Once reports have been returned they will no longer be accepted. **Students must achieve a minimum of 50% on the laboratory component to pass the course.**

## Examinations

There is a midterm and cumulative final examination with topics and weighting shown below.

The examinations are "closed book" though formula and sheets will be provided.

### Evaluation:

Homework	8%
Assignments	17%
Labs*	25%
Midterm Exam: Chapters 3 to 9	20%
Final Exam: Chapters 3 to 9 and emphasis on 25, 18, 19, 22, and 23	<u>30%</u>
Total	100%

\* A minimum 50% score must be obtained in the laboratory in order to receive credit for the course.

Yukon College uses a letter grade system and calculates weighted grade point averages (GPA) on a 4.0 scale. Following are equivalents of the letter grades:

LETTER GRADE	PERCENTAGE EQUIVALENT	GRADE POINT
A+	95 – 100	4.0
A	86 – 94	4.0
A-	80 – 85	3.7
B+	75 – 79	3.5
B	70 – 74	3.0
B-	65 – 69	2.7
C+	62 – 64	2.5
C	58 – 61	2.0
C-	55 – 57	1.7
D	50 – 54	1.0
F	under 50	0.0

#### Rewrites

A rewrite for a failing grade on an examination (less than 50%) may be permitted at the instructor's discretion. These examinations will be written no earlier than two weeks after the date of the original examination. The mark will be recorded whether it is higher or lower than the original. However, a maximum mark of 65% will be awarded.

#### "No Shows"

A student who misses an examination will receive a mark of zero for that examination but may be permitted a rewrite. Exceptions may be made if a student receives prior permission from the instructor, or faces an emergency. Some form of documentation of the emergency may be required.

#### Plagiarism

Plagiarism involves representing the words of someone else as your own, without citing the source from which the material is taken. If the words of others are directly quoted or paraphrased, they must be documented according to standard procedures (APA). The resubmission of a paper for which you have previously received credit is considered a form of plagiarism.

Plagiarism is academic dishonesty, a serious academic offence, and will result in you receiving a mark of zero (F) on the assignment or the course. In certain cases, it can also result in dismissal from the college. And do not underestimate the impact such a situation will have on your reputation.

## **Electronic Devices**

In order to be successful in classes and minimize distractions for others, cell phones, iPods and other electronic devices must be turned off while students are in class. In an emergency situation, the instructor may give a student permission to use a cell phone or pager.

## **Appropriate Language**

In all areas of the college environment, students are responsible to show respect for others, swearing, or language that is discriminatory or derogatory in relation to race, sex, ethnic background, religious beliefs, age and physical condition is not appropriate.

## **STUDENTS WITH DISABILITIES OR CHRONIC CONDITIONS:**

Reasonable accommodations are available for students with a documented disability or chronic condition. It is the student's responsibility to seek these accommodations. If a student has a disability or chronic condition and may need accommodation to fully participate in this class, he/she should contact the Learning Assistance Centre (LAC) at (867) 668-8785 or lassist@yukoncollege.yk.ca.

## **REQUIRED TEXTBOOKS/MATERIALS:**

### **Course Materials:**

OpenStax College, College Physics, <http://cnx.org/content/col11406/1.7>, 2012. A modified print version of this will be distributed.

For copyright and attribution information for Yukon College, *Physics 050 Laboratory Manual*, 2013.

Scientific non-programmable calculator. Scientific graph paper (decimal, not quarter inch)

## **EQUIVALENCY/TRANSFERABILITY:**

Yukon College Physics 060 is articulated as Provincial Physics in the Adult Basic Education system (ABE) in British Columbia and Yukon. For more information see ABE in BC Articulation Handbook <http://www.aved.gov.bc.ca/abe/docs/handbook.pdf>

Or <http://www.bctransferguide.ca/program/abe/>

ABE Provincial Physics is now considered an External Credential by the British Columbia Ministry of Education. Please search "ABE Provincial Physics" at [http://www.bced.gov.bc.ca/datacollections/course\\_registry\\_web\\_search/simple-search.php](http://www.bced.gov.bc.ca/datacollections/course_registry_web_search/simple-search.php)

For more information see A.B.E. Articulation Handbook or Chapter 2 of the British Columbia Ministry of Education Handbook of Procedures <http://www.bced.gov.bc.ca/exams/handbook/>

## TOPIC OUTLINE/ SYLLABUS

Physics 060 covers the Core Topics for Physics: Provincial Level set out in A.B.E. in B.C. Articulation Handbook <http://www.aved.gov.bc.ca/abe/docs/handbook.pdf>

More Specifically:

- **Kinematics**
- Vectors in Two Dimensions
- Graphical Addition, Law of Cosines and Sines, Resolution of Vectors
- Parabolic Motion
- Projectile Motion Calculations
- Relative Velocities
  
- **Dynamics**
- Newtons Laws
- Free-body diagrams
- Free-body diagrams in Two Dimensions
- Gravity
- Normal Force
- Friction
- Inclined Plane Problems
- String-and-Pulley Problems
- Combination Friction, Inclined Plane and String-and-Pulley Problems
- Uniform Circular Motion
- Centripetal Force
- Banked Curves
- Orbits and Kepler's Laws
- Statics
  - Centre of Mass
  - Forces
  - Torque
  - Equilibrium: Balancing Forces and Torque
- The Human Body
- Stability and Equilibrium
- Momentum and Impulse
- Conservation of Momentum in One Dimension
  
- Conservation of Momentum in Two Dimensions
- Work, Power, Kinetic, Gravitational and Elastic Potential Energy
- Conservation of Energy
- Inelastic and Elastic Collisions
  
- **Waves and Optics**
- Wave Motion
- Wave Properties: Period, Frequency, Wavelength, Amplitude
- The Wave Equation and Wave Speed
- Reflection
- Images in Plane Mirrors
- Ray Diagrams for Curved Mirrors
- Thin Lens Formula for Curved Mirrors
- Refraction
- Index of Refraction
- Snell's Law
- Apparent Depth
- Total Internal Reflection
- The Doppler Effect
- Lenses and Ray Diagrams
- Calculations with Lenses- the Thin Lens Equation
- Refractive Power, Power of Accommodation, Near and Far Points
  
- **Electrostatics**
- The Basis of Electric Charge
- The Creation and Transfer of Charge
- Coulomb's Law

- The Vector Nature of Electric Forces between Charges in One and Two Dimensions
- Electric Field Lines
- Electric Field Strength
- The Vector Nature of Electric Field Strength between Charges in One and Two Dimensions
- Electric Potential and Electric Potential Energy
- The Movement of Charged Particles in a Field
- Electric Potential around a Point Charge
- The Electric Field Strength of a Parallel-Plate Apparatus

- **Electromagnetism**

- The Law of Magnetic Forces
- Magnetic Field Lines
- Oersted's Principle, Magnetic Fields around Conductors and Solenoids, the Left-Hand Rules
- Electromagnets
- The Motor Principle
- Magnetic Field Strength
- Biot's Law and Field Strength around Conductors
- Magnetic Force on Moving Charges
- Centripetal Magnetic Force and Mass Spectrophotometer
- Electromagnetic Induction
- Lenz's Law
- Generation of Electricity
- Electric Motors
- Transformers