Applied Science and Management Division
School of Science
Winter 2015-2016

COURSE OUTLINE

PHYSICS 060

Principle of Physics

98 HOURS
3 CREDITS

PREPARED BY: Tom McBee DATE: January 4, 2016

APPROVED BY: DATE:

APPROVED BY ACADEMIC COUNCIL: 1993

RENEWED BY ACADEMIC COUNCIL:

Applied Science and Management
PHYS 060
3 Credit Course
Winter 2015 - 2016

Principle of Physics

INSTRUCTOR:	Tom McBee
OFFICE HOURS:	TBA
OFFICE LOCATION:	Room A2718
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COURSE OFFERING	January 6, 2015 to April 27, 2016	
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:	A2103
	Labs:	A2801

COURSE DESCRIPTION

College Preparation Physics 060 will allow students to take Physics 101 at Yukon College, or a 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 Provincia Level Physics located in the current ABE in BC Articulation Handbook
- 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 fourteen 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, one from each topic. 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 1 to 9	20%
Final Exam:	Chapters 1 to 9 with emphasis on 18, 19, 21, 22, 16, 24, 25, and 26	30%
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:

Cutnell, John, Johnson, Kenneth, Physics, 5th ed. 2001 (provided)
Yukon College, *Physics 060 Laboratory Manual*, 2013 (provided)
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 page 44 of the 2014-2015 edition of the A.B.E. in B.C. Articulation Handbook http://www.bctransferguide.ca/docs/ABE_Artic_Guide_15-16%20Final.pdf
Or http://www.bctransferguide.ca/program/abe/

ABE Provincial Physics is now considered an External Credential by the British Columbia Ministry of Education. For more information see page 23 of the A.B.E. Articulation Handbook or search "ABE Provincial Physics" at http://www.bced.gov.bc.ca/datacollections/course_registry_web_search/simple-search.php

TOPIC OUTLINE/ SYLLABUS

Physics 060 covers the Core Topics for Physics: Provincial Level set out in current A.B.E. in B.C. Articulation Handbook

More Specifically:

- Vectors in Two Dimensions
- Graphical Addition, Law of
- The Nature of Physics
- Units and the Role of Units in Problem Solving
- Trigonometry
- Vectors

- **Kinematics**
- Displacement
- Speed and Velocity
- Acceleration
- Equations of Kinematics
- Applications
- Freely Falling Bodies
- Graphical Analysis
- Displacement, Velocity and Acceleration in Two Dimensions
- Projectile Motion
- Relative Velocity

- **Dynamics**
- Newtons Laws
- The Gravitational Force
- The Normal Force
- Static and Kinetic Frictional Forces
- The Tension Force
- Equilibrium Applications
- Non Equilibrium Applications
- Uniform Circular Motion
- Centripetal Acceleration and Force
- Banked Curves
- Satellites in Circular Orbits
- Work
- the Work-Energy Theorem
- Kinetic Energy
- Gravitational Potential Energy
- The Conservation of Mechanical Energy
- Nonconservative Forces and the Work-Energy Theorem
- Power
- Work Done by a Variable Force
- Momentum and Impulse
- Collision in One Dimension
- Collision in Two Dimensions
- Center of Mass

- **Electrostatics**
- The Origin of Electricity
- Charged Objects and the Electric Force
- Conductors and Insulators
- Charging by Contact and by Induction
- Coulomb’s Law
- The Electric Field
- Electric Field Lines
- Guass’ Law
- Applications
- Potential Energy
- The Electric Potential Difference
- The Electric Potential Difference created by Point Charges
- Equipotential Surfaces
- Capacitors and Dielectrics
- Biomedical Applications

- **Electromagnetism**
- Magnetic Fields
- The Motion of a Charged Particle in an Electric Field
- The Mass Spectrometer
- The Force on a Current in a Magnetic Field
- The Torque on a Current-Carrying Coil
- Magnetic Fields Produced by Currents
- Ampere's Law
- Magnetic Materials
- Induced Emf and Induced Current
- Motional Emf
- Magnetic Flux
- Faraday's Law
- Lenz's law
- Applications
- The Electric Generator
- Mutual Inductance
- Transformers

- **Waves and Optics**
- The Nature of Waves
- Periodic Waves
- The Mathematical Description of a Wave
- Wave Fronts and Rays
- The Reflection of Light
- The Formation of Images by a Plane Mirrors
- Spherical Mirrors
- The Formation of Images by Spherical Mirrors
- The Mirror Equation and the Magnification Equation
- The Index of Refraction
- Snell's Law and the Refraction of Light
- Total Internal Reflection
- Polarization and the Reflection and Refraction of Light
- The Dispersion of Light
- Lenses
- The Formation of Images by Lenses
- The Thin-Lens Equation and the Magnification Equation
- Lenses in Combination
- The Human Eye
- Angular Magnification and the Magnifying Glass
- The Compound Microscope
- The Telescope
- Lens Aberrations