School of Arts & Science
PHYSICS DEPARTMENT

Course Outline

PHYS 154   TECHNICAL PHYSICS 3

A Physics course with applications relevant to Electronics Technology.   Topics include measurement, vectors, kinematics, dynamics, uniform circular motion, rotary motion, vibrations, waves, sound and light.

OFFERED:	Q1
CREDIT:	4
IN-CLASS WORKLOAD:	4 lecture, 2 lab (alt. weeks), 1 seminar
PRE-REQUISITES:	Physics 151 or Physics 11 and Math 172 or Math 11 or Applications of Math 12

REQUIRED MATERIALS:

Textbook: "Physics For Technology", 2rd edition, Betts, J.E.
Physics 154 lab manual
Bound laboratory notebook
Graph paper (millimeter/centimeter ruled graph paper is preferred)
Calculator

DEPARTMENT POLICIES REGARDING TESTING:

1.   Students must write quizzes, tests, midterm tests, etc., on the date and time assigned by the instructor.   Missed exams normally receive a zero grade.   In exceptional circumstances such as medical issues or a documented illness, a make-up exam may be given or the test may be waived at the discretion of the instructor.   The instructor should be notified prior to the exam.

2.   The final exam will cover the entire course and will be 3 hours long.   As stated in the current college calendar (p. 39) "students are expected to write tests and final exams at the scheduled time and place."   Exceptions will only be considered for emergency circumstances as outlined in the calendar.   Excursions, holidays or scheduled travel flights are not accepted.

DEPARTMENT POLICIES REGARDING LABS:

1.   Lab exercises will be done on a bi-weekly basis during the scheduled lab period.   Attendance is mandatory and you will be required to "sign in" at the beginning of each one.   If, at the end of the lab period, it becomes necessary to complete your report at home,   your data must be reviewed and signed (initialed) by the instructor before leaving the lab.

2.   All assigned laboratory exercises and reports must be completed with an overall grade of 60% in order to obtain credit for this course.   Attendance is required for all lab

exercises at the scheduled times. A lab may be made up at a later time only in the case of documented illness or other extenuating circumstances.

3. Late Penalties: Reports for labs done on alternate weeks will normally be due at the end of the next lab period in the following week. For overdue labs, a late penalty of one mark per day (10%) will be assessed for the first five days following the due date. After this date a complete report is still required and earns a maximum mark of 5/10.

4. At the discretion of the instructor, a student who is repeating this Physics course may not be required to complete the laboratory exercises a second time if an average lab grade of 70% or better was obtained.

STUDY TIME

It is recommended that between 5 and 10 hours per week (or more for students with a weak background) be spent studying for this course outside of class time.

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College Calendar or the College web site under "Getting Your Coursework Done" at: www.camosun.bc.ca/services

ACADEMIC CONDUCT POLICY

There is an Academic Conduct Policy which includes plagiarism. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, Registration, and on the College web site in the Policy Section at: www.camosun.bc.ca/divisions/pres/policy/2-education/2-5.html

GRADING

The standard mark distribution for this course is as follows:

Final Exam	50%
Midterms and other work	40%
Lab Reports	10%
	100%

COURSE OUTLINE

TUTORIAL TOPICS:

1. **Measurement & Units – The International System**
    1.1   Systeme Internationale (SI)
        1.1.1   Base units
        1.1.2   Prefixes
        1.1.3   Derived units
    1.2   British Engineering and US Customary systems and conversions
    1.3   Dimensional algebra

2. **Kinematics**
    2.1   Linear kinematics - Review
OUTLINE:

1. **Vectors**

    1.1 Components of vectors
    1.2 Vector addition and subtraction
    1.3 Kinematic examples
        1.3.1 Displacement, velocity, acceleration
        1.3.2 Relative motion
    1.4 Vector multiplication
        1.4.1 Scalar product and work
        1.4.2 Vector product and torque

2. **Dynamics – Newton's Laws**

    2.1 Newton's second law
        2.1.1 Forces – tension, springs, friction, gravity
        2.1.2 Free-body diagrams
        2.1.3 Two-dimensional problems
        2.1.4 Problems with two connected objects

3. **Equilibrium**

    3.1 Concurrent coplanar forces – algebraic 2-D problems
    3.2 Non-concurrent forces

4. **Work and Energy**

    4.1 Concept of work
    4.2 Mechanical energy
        4.2.1 Kinetic energy
        4.2.2 Potential energy – gravitational and elastic
    4.3 Conservation of energy
    4.4 Power

5. **Uniform Circular Motion**

    5.1 Centripetal acceleration
    5.2 Centripetal force

6. **Rotary Motion**

    6.1 Equations of uniform rotary motion
    6.2 Torque
    6.3 Moment of inertia
    6.4 Rotational dynamics
    6.5 Rotational energy
    6.6 Rotational power

7. **Vibrations**

    7.1 Periodic motion
        7.1.1 Period, frequency and amplitude
    7.2 Simple harmonic motion
        7.2.1 Definition
        7.2.2 Circular motion and SHM

INSTRUCTOR INFORMATION

Instructor:	Wilf Nienaber
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Location:	T 218
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