



COURSE OUTLINE

The course description is online @ @ <http://camosun.ca/learn/calendar/current/web/phys.html>

Ω Please note: the College electronically stores this outline for five (5) years only.
It is **strongly recommended** you keep a copy of this outline with your academic records.
You will need this outline for any future application/s for transfer credit/s to other colleges/universities.

1. Instructor Information

(a)	Instructor:	Ed Nelson		
(b)	Office Hours:	MTWTh 10:30 – 11:20		
(c)	Location:	OFFICE TECH 218		
(d)	Phone:	250 370 4435	Alternative Phone:	
(e)	Email:	nelson@camosun.bc.ca		
(f)	Website:	D2L (online.camosun.ca)		

2. Intended Learning Outcomes

(No changes are to be made to these Intended Learning Outcomes as approved by the Education Council of Camosun College.)

Upon completion of this course the student will be able to:

1. Solve technical problems involving distance, displacement, speed, velocity and acceleration in one and two dimensions.
2. Solve problems involving the application of Newton's Laws to two or more bodies moving in one and two dimensions.
3. Solve technical problems involving torque and rotational motion.
4. Solve technical problems involving work, energy, and power.
5. Define and describe the following properties of waves: period, frequency, wave speed, and amplitude. State the principal of superposition and understand the properties of waves undergoing constructive and destructive interference.
6. Define and describe Simple Harmonic Motion.
7. Solve technical problems involving light reflection, refraction, critical angle and total internal reflection applications.
8. Use fundamental thermal physics, including thermometry conversions, to perform calculations involving calorimetry and specific heat.
9. Use the principles of static electricity to solve problems involving the Coulomb force, electric fields, and electric fields in capacitors.
10. Describe and solve problems involving insulators, conductors and semiconductors.
11. Describe the effects of magnetic fields, and perform calculations involving Faradays Law and Induction.
12. Assemble simple experimental apparatus using written instructions.
13. Observe record, organize and display data in tables, graphs or charts.
14. Analyze linear graphs (determine area, slope, intercept, etc.).
15. Interpret meaning of experimental results in the context of the experimental objectives.

3. Required Materials

- (a) "College Physics", Knight, Jones, and Field, 3rd edition, Pearson (Publisher)
- (b) PHYS 157 Lab Manual
- (c) Graph Paper Package
- (d) Basic Scientific Calculator; Drawing Set

4. Course Content and Schedule

- (a) LEC TWTh 9:30 – 10:20 TECH 222
- (b) SEM T Group B 8:30 – 9:20 TECH 222; Group A 2:30 – 3:20 TECH 222
- (c) LAB F 9:30 – 10:20 TECH 222 Alternating weeks

5. Basis of Student Assessment (Weighting)

- (a) Weekly Assignments 5%
- (b) Weekly Quizzes 5%
- (c) Midterms 30% (Best 3 out of 4)
- (d) Labs (MANDATORY) 10%
- (e) Final Exam 50%

6. Grading System

(No changes are to be made to this section unless the Approved Course Description has been forwarded through the Education Council of Camosun College for approval.)

Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite.	1
0-49	F	Minimum level has not been achieved.	0

Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy E-1.5 at camosun.ca for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. (For these courses a final grade will be assigned to either the 3 rd course attempt or at the point of course completion.)
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.

7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

LEARNING SUPPORT AND SERVICES FOR STUDENTS

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There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services, or the College web site at camosun.ca.

STUDENT CONDUCT POLICY

There is a Student 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, at Student Services, and the College web site in the Policy Section.

ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED

OUTLINE:

1. **Kinematics in One and Two Dimensions**

- 1.1 SI Units, Unit Conversions, and Significant Figures
- 1.2 Kinematic Equations for One Dimensional Motion
- 1.3 Vector Algebra in Two Dimensions
 - 1.3.1 Vector Algebra Diagrams
 - 1.3.2 Vector Algebra by Components
 - 1.3.3 Kinematics in Two Dimensions – Projectile Motion

2. **Dynamics in One and Two Dimensions**

- 2.1 Newton's Laws of Motion
 - 2.1.1 Newton's 2nd Law of Motion
 - 2.1.2 Mass and Weight
 - 2.1.3 Equilibrium in One and Two Dimensions
 - 2.1.4 Newton's 3rd Law of Motion
- 2.2 Interacting Objects
 - 2.2.1 Objects connected by ropes
 - 2.2.2 Contact forces between objects

3. **Torque and Rotational Motion**

- 3.1 Uniform Circular Motion
 - 3.1.1 Centripetal Acceleration and Force
 - 3.1.2 Equations of Uniform Circular Motion
- 3.2 Torque
 - 3.2.1 Definition
 - 3.2.2 Definition of Moment of Inertia
- 3.3 Accelerated Rotational Motion
 - 3.3.1 Equations of Rotational Kinematics

4. **Work and Energy and Power**

- 4.1 Concept of work
- 4.2 Mechanical energy
 - 4.2.1 Kinetic energy
 - 4.2.2 Gravitational Potential energy
 - 4.2.3 Elastic Potential energy
- 4.3 Conservation of energy
- 4.4 Power

5. **Simple Harmonic Motion**

- 5.1 Hooke's Law
- 5.2 Oscillations
 - 5.2.1 Amplitude, Frequency, Period
 - 5.2.2 Energy in Simple Harmonic Motion
 - 5.2.3 Damped Oscillations (descriptive)

6. **Waves and Superposition of Wave**

- 6.1 Travelling Waves
 - 6.1.1 Types of Travelling Waves
 - 6.1.2 Mathematical Description of Travelling Waves
- 6.2 Standing Waves
 - 6.2.1 Standing Waves on Strings
 - 6.2.2 Standing Waves in Air

7. **Geometric Optics**

- 7.1 Ray Model of Light
- 7.2 Law of Reflection
 - 7.2.1 Plane Mirrors
 - 7.2.2 Spherical Mirrors
- 7.3 Law of Refraction
 - 7.3.1 Snell's Law
 - 7.3.2 Lenses
 - 7.3.3 Total Internal Reflection
- 7.4 Dispersion

8. **Thermal Physics**

- 8.1 Temperature Scales
 - 8.1.1 Temperature Conversions
 - 8.1.2 Thermometers
- 8.2 Thermal Energy
 - 8.2.1 Specific Heat
 - 8.2.2 Phases of Matter and Phase Changes
 - 8.2.3 Latent Heats
- 8.3 Calorimetry
- 8.4 Thermistors
 - 8.4.1 Properties
 - 8.4.2 Methods of Use
- 8.5 Thermocouples
 - 8.5.1 Properties
 - 8.5.2 Methods of Use

9. **Electrostatics**

- 9.1 Electric Charge
 - 9.1.1 Properties
 - 9.1.2 Fundamental Unit of Charge
- 9.2 Coulomb's Law
- 9.3 Electric Field
- 9.4 Electric Field in Capacitors

10 **Magnetism and Magnetic Induction**

- 10.1 Sources of the Magnetic Field
 - 10.1.1 Naturally Occurring Magnetism
 - 10.1.2 Solenoids
- 10.2 The Right Hand Rule (sources)
- 10.3 Magnetic Forces on Current-Carrying Wires
 - 10.3.1 DC Motor
- 10.4 Magnetic Induction (definition)
- 10.5 Motional Electromotive Force
 - 10.5.1 The Generator
- 10.6 Magnetic Flux
- 10.7 Faraday's Law of Induction