	School of Arts & Science
	DEPARTMENT OF PHYSICS AND ASTRONOMY
	PHYS 140-001
	Physics for Scientists and Engineers 1
	Fall 2017

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:	Christopher Avis		
(b)	Office Hours:	Mon., Wed., Fri.: 11:30 AM -12:20 PM, Tue., Thu.: 12:30 PM-1:20 PM		
	Location:	Fisher 346D		
(d)	Phone:	250-370-3460	Alternative Phone:	N/A
(e)	Email:	avisc@camosun.bc.ca		
(f)	Website:	D2L (online.camosun.ca)		

2.   Intended Learning Outcomes

Upon completion of this course the student will be able to:
1. Apply techniques of vector algebra to solve problems where vectors sum to zero or calculate resultant vectors.
   a. Perform coordinate system conversions.
   b. Demonstrate operations of vector addition and subtraction using graphical, vector component and unit vector techniques.
   c. Calculate and interpret scalar product and vector products.

2. Solve problems involving particle kinematics and dynamics for translational motion with non-constant force.
   a. Apply kinematic equations to analyze motion of objects subject to constant acceleration.
   b. Use calculus to analyze motion of objects with non-constant acceleration.
   c. Use vector components to analyze motion in two and three dimensions.
   d. Solve problems for objects undergoing uniform and non-uniform circular motion.
   e. State and apply Newton's Laws to analyze systems subject to concurrent forces including friction, inclines and connected objects.

3. Analyze the rotational motion of rigid bodies.
   a. Calculate the center-of-mass and moment-of-inertia for uniform objects including the parallel-axis theorem.
   b. Perform calculations and answer conceptual questions using torques. Solve equilibrium problems for non-concurrent forces.
   c. Define the rotational kinematic quantities; transform between linear and rotational quantities.
   d. Use the rotational form of Newton's 2nd Law to solve dynamics problems.
   e. Apply translational and rotational conditions of mechanical equilibrium.

4. Use work-energy theorem and other conservation laws to solve applied problems.
   a. Solve problems involving work by constant and non-constant forces in two andthree dimensions.
   b. Calculate work, energy and power for rotational systems.
   c. Perform calculations utilizing the conservation of momentum of isolated systems for elastic and inelastic collisions.
   d. Perform calculations utilizing the conservation of angular momentum for rotating systems.

5. Apply concepts of dynamics, work and energy to analyze charged particles in electric and magnetic fields.
   a. Calculate electric fields, forces, potential and potential energy for point charges and simple charge distributions.
   b. Perform calculations for charged particles moving in uniform electric and magnetic fields; describe their motion and practical applications.
   c. Solve problems for multi-branch direct current circuits using Ohm's Laws and Kirchhoff's Rules.

6. Examine the validity of key physical principles through the use of practical experimental techniques
   a. Assemble experimental apparatus using written instructions.
   b. Observe and record data including sources of error and estimate the range of uncertainty in results.
   c. Interpret meaning of experimental results in the context of the experimental objectives.
   d. Write scientific reports in correct format.

3. Required Materials

(a) Texts: <u>Physics for Scientists and Engineers</u>, *4th Edition*, Knight, R.D.

(b) Other: Physics 140/141 Laboratory Manual, Scientific Calculator, Ruler

4. Course Content and Schedule

Monday:	Lecture: 8:30 AM – 9:20 AM	Fisher 322
Tuesday:	Lecture: 8:30 AM – 9:20 AM	Fisher 302
Wednesday:	Lecture: 8:30 AM – 9:20 AM	Fisher 322
Thursday	Lab: 8:30 AM – 9:20 AM,	Fisher 322
Friday:	Lecture: 8:30 AM – 9:20 AM,	Fisher 322

5. Basis of Student Assessment (Weighting)

(a) Homework: 5%   (b) Lab Reports: 15%   (c) Lab Exam: 10 %

(d) Term Tests: 30%   (e) Final Exam: 40 %

Tests are scheduled as follows:

Test #1: Weds. Sept. 27th,
Test #2: Weds. Oct. 25th,
Test #3: Weds. Nov. 22nd,
Lab Exam: Weds. Dec. 6th

INSTRUCTOR SPECIFIC POLICIES

1. Homework for a particular week will cover up to whatever section is finished on the last lecture of that week. It will be due at the end of the day on the following Friday and will be checked for completeness.

2. Labs for a particular week will be due by the end of the day one week following the lab. Each student is allowed one dropped or missed lab.

3. Please refer to the D2L website regularly for important announcements and an up-to-date calendar with due dates and test dates.

4. Missed tests and labs will only be excused if I am contacted within 24 hours of the absence and with proper supporting documentation provided (counselor's note, doctor's note, etc...). Otherwise, a mark of zero will be assigned.

PHYSICS DEPARTMENT POLICIES REGARDING TESTING:

1. The final exam will cover the entire course and will be 3 hours long. As stated in the current college calendar on page 39, "students are expected to write tests and final exams at the scheduled time and place." Exceptions will only be considered due to emergency circumstances as outlined in the calendar. Holidays or scheduled flights are not considered to be emergencies.

2. Students must write quizzes, tests, midterm tests, etc., on the date and time assigned by the instructor. Missed exams normally receive a zero grade. Instructors are not required to provide make-up tests. At their discretion, instructors may waive a test in exceptional circumstances such as medical issues or a documented illness.

PHYSICS DEPARTMENT POLICIES REGARDING LABS:

1. Lab attendance is mandatory – you cannot complete a lab using someone else's data and you may be required to "sign in" at the beginning of each lab period. A lab may be waived or made up at a later time only in the case of documented illness or other extenuating circumstances. If you will be absent from a lab period due to illness it is your responsibility to notify your instructor.

2. Unless otherwise stated by your instructor late penalties are as follows: For overdue labs (or assignments), a late penalty of 1 mark per day (10%) will be assessed for the first five days following the due date. After this date a complete report earns a maximum mark of 50%.

3. At the discretion of the instructor, a student who is repeating this Physics course may apply for lab exemption.

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	*Incomplete*: 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	*In progress*: 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 3rd course attempt or at the point of course completion.)*
CW	*Compulsory Withdrawal:* 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

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.