CAMOSUN COLLEGE	***School of Arts & Science*** ***PHYSICS DEPARTMENT*** **PHYS 200-001** **Mechanics 2** **Semester/Year, eg, 2007F or 2007Q1**

COURSE OUTLINE

The Approved Course Description is available on the web @ _____

Ω *Please note: this outline will be electronically stored for five (5) years only.*
It is strongly recommended students keep this outline for your records.

1. Instructor Information

(a)	Instructor:			
(b)	Office Hours:			
(c)	Location:			
(d)	Phone:		Alternative Phone:	
(e)	Email:			
(f)	Website:			

2. Intended Learning Outcomes

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

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

1. Define the concept of moment of inertia and solve technical problems related to the rotational dynamics of rigid bodies (parallel and perpendicular axis theorems, moment of inertia of symmetric objects).
2. State the law of Universal Gravitation and describe the interior and exterior shell theorems. Solve technical problems related to gravitational attraction between extended objects and a point mass. State and apply Kepler's Laws of Planetary motion to simple problems of celestial mechanics.
3. State and describe the principles of special relativity and use spacetime diagrams to solve simple problems involving time dilation, length contraction, and the addition of velocities.
4. State the ideal gas equation of state and underlying assumptions, and define molecular flux. Solve technical problems associated with the ideal gas.
5. State the equation and conditions for simple harmonic motion, and solve technical problems related to small-amplitude oscillations of mechanical systems, including free, damped and forced oscillations.
6. State Archimede's Principle, Pascal's Principle, Bernoulli's Principle and the equation of continuity, and solve technical problems related to hydrostatic fluids and fluid flow.
7. Solve problems involving the superposition, interference, transmission and reflection of mechanical traveling waves, including the Döppler effect for moving sources and receivers.

3. Required Materials

(a) Texts — Physics for Scientists & Engineers with Modern Physics, *6th edition*, Serway, R.A., and Jewett, J.W.Jr.

(b) Other — Supplementary material supplied by instructor
Physics 200 Laboratory Manual
Graph paper (must be either 10 lines/inch or millimeter graph paper)

4. Course Content and Schedule

(Can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)

5. Basis of Student Assessment (Weighting)

(Should be linked directly to learning outcomes.)

The student must be successful (≥ 60%) in both the theory and laboratory assignments to pass the course. The approximate percentages used for the final grading are:

Quizzes	30%
Lab Work	20%
Final Exam (3 hours)	50%

Midterm tests may be discounted from the grading distribution (see above) if all term work, including term tests, labs, and assignments, has been completed and is 60% or higher. In this case, the final grade for the course may be based on a combination of the final exam (90%) and the lab mark (10%).

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. Instructors are not required to provide make-up tests. At their discretion, instructors may waive a test or provide a make-up test only in the event of documented illness or other extenuating circumstances.

PHYSICS DEPARTMENT POLICIES REGARDING LABS:

1. All assigned laboratory exercises and reports must be completed and handed in prior to the date of the final exam with an overall grade of 60% in order to obtain credit for the course. 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. At the discretion of the instructor, a student who is repeating this Physics course may apply for lab exemption.

6. Grading System

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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 on the College web site in the Policy Section.

OUTLINE:

1. **Rotational Motion**

    1.1 Rotational kinetic energy; moment of inertia (with extended mass distribution)
    1.2 Angular kinematic quantities
    1.3 Torque and angular momentum
    1.4 Problems involving rotational (fixed axis) dynamics of rigid bodies

2. **Oscillatory Motion**

    2.1 Simple harmonic motion
        2.1.1 Energy of simple harmonic motion
        2.1.2 Damped simple harmonic motion
        2.1.3 Forced simple harmonic motion
    2.2 The simple pendulum
    2.3 The physical pendulum

3. **Mechanical Waves**

    3.1 Types of mechanical waves
        3.1.1 Wave velocity
        3.1.2 Superposition and interference
    3.2 Transmission and reflection of waves
        3.2.1 Transmission of energy
    3.3 Sound Waves
        3.3.1 Velocity of sound waves
        3.3.2 Spherical and plane waves
        3.3.3 The Doppler effect
    3.4 Standing Waves

4. **Fluid Mechanics**

    4.1 Fluid statics
        4.1.1 Pressure and density
        4.1.2 Pascal's principle
        4.1.3 Archimedes' principle
    4.2 Fluid dynamics
        4.2.1 Equation of continuity
        4.2.2 Bernoulli's equation
        4.2.3 Applications of Bernoulli's equation

5. **Kinetic theory of gases**

    5.1 The ideal gas model

- 5.1.1 Kinetic calculation of pressure
- 5.1.2 Kinetic interpretation of temperature
- 5.1.3 Internal energy of an ideal gas

5.2 Non-ideal gases – Optional material

5.3 *Transport phenomena – Optional material*

6. **Gravitation**

- 6.1 Universal law of gravitation
- 6.2 Gravitational potential energy
- 6.3 Gravitational field
- 6.4 Kepler's laws of planetary motion

7. **Special Relativity**

- 7.1 Introduction
  - 7.1.1 Simultaneity
  - 7.1.2 Relativistic description of time
  - 7.1.3 Relativistic description of length
  - 7.1.4 Lorentz transformations
  - 7.1.5 Relativistic momentum
  - 7.1.6 Relativistic energy
- 7.2 Consequences of special relativity
- 7.3 Space-time diagrams (Refer to supplementary material provided by instructor)