



School of Arts & Science
PHYSICS DEPARTMENT
PHYS 114 - Section 001
Fundamentals of Physics 1
Winter 2016

COURSE OUTLINE

The Approved Course Description is available on the web @ <http://camosun.ca/learn/calendar/current/web/phys.html>

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

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|-----|---------------|---|--------------------|--|
| (a) | Instructor: | Christopher Avis | | |
| (b) | Office Hours: | M: 11:30-12:20, Tu: 10:30-11:20, W: 11:30-12:20, Th: 1:30-3:20, F: 9:30-10:20 | | |
| (c) | Location: | | | |
| (d) | Phone: | | Alternative Phone: | |
| (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. Demonstrate proficiency in solving vector algebra problems, including coordinate system conversions, use of unit vectors, vector addition, dot product, and cross product.
2. Solve technical problems involving particle kinematics and dynamics with non-constant force using calculus in two and three dimensions.
3. Solve technical problems for objects undergoing uniform and non-uniform circular motion, and calculate centripetal forces and acceleration.
4. Solve technical problems using calculus involving work by constant and non-constant forces, the work-energy theorem, gravitational and elastic potential energy, in two and three dimensions.
5. Solve technical problems utilizing the concept of conservation of momentum of isolated systems, including elastic and inelastic collisions, the coefficient of restitution, and momentum conservation of systems of particles involving mass changes.
6. Define the rotational kinematic quantities: angular velocity and angular acceleration. Transform between linear and rotational quantities. Use the rotational form of Newton's 2nd Law to solve dynamics problems. Calculate work, energy and power for rotational systems.
7. Calculate the centre-of-mass and moment-of-inertia for uniform objects. Use the parallel-axis theorem for moment-of-inertia calculations. Perform calculations and answer conceptual questions using torques. Solve equilibrium problems for non-concurrent forces.
8. Solve technical problems involving the translational and rotational conditions of mechanical equilibrium of rigid systems.
9. Assemble experimental apparatus using written instructions.
10. Observe, record, organize and display data in tables, graphs or charts.
11. Analyze linear graphs (determine area, slope, intercept, etc.).

12. Observe and record sources of error and estimate the range of uncertainty in results.
13. Interpret meaning of experimental results in the context of the experimental objectives.
14. Write scientific reports in an acceptable, traditional format.

3. Required Materials

- (a) Texts University Physics, 13th or 14th edition, Young, H.D., and Freeman, R.A
 (b) Other Physics 114/115 Laboratory Manual
 Scientific Calculator (no graphing calculators – no cellphones!)

4. Course Content and Schedule

Lecture: Mon.: 12:30-1:20, Ewing 344 Lab: Wed.: 12:30-2:20, Fisher 316
 Tue., Fri.: 12:30-1:20, Fisher 322
 Thu.: 8:30-9:20, Fisher 302

5. Basis of Student Assessment (Weighting)

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

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|----------------------|-----|
| Homework | 5 % |
| Tests | 30% |
| Lab Work | 15% |
| Final Exam (3 hours) | 50% |

Tentative test dates are as follows: Wed, Feb. 3rd; Wed, Mar. 2nd, Wed, Mar. 30th

COURSE SPECIFIC POLICIES

1. Homework problems for a particular week will cover up to whatever section is finished on the last lecture of that week. They 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. You must be present to collect your own data during a lab (as will be verified with a sign in sheet). Labs completed using others' data will not be accepted.
4. In the event that a student misses a lab, it is their responsibility to contact the instructor within 24 hours to arrange a make-up lab. Make up labs will only be granted for valid excused absences such as an illness or family emergency and supporting documentation must be provided.

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.

3. Refer to your instructor's information page for any additional policies regarding testing and grade calculation.

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.
2. Attendance is mandatory & 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.
3. 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 is still required and earns a maximum mark of 50%.

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

6. Grading System

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.) |

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| 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. |
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7. Recommended Materials or Services to Assist Students to Succeed

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, 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. www.camosun.bc.ca/divisions/pres/policy/2-education/2-5.html