

**UNIVERSITY OF CALGARY  
DEPARTMENT OF PHYSICS AND ASTRONOMY  
COURSE OUTLINE**

1. **COURSE: Physics 343 – Classical Mechanics II**

L01: TR 15:30 – 16:45, ST 130, Dr. A. Louro, SB 533 403-220-8648, [louro@ucalgary.ca](mailto:louro@ucalgary.ca), office hours: MWF according to the instructor’s calendar. A website for the course may be accessed by students on Blackboard.

PHAS main office: SB 605, 403-220-5385, [office@phas.ucalgary.ca](mailto:office@phas.ucalgary.ca).

2. **PREREQUISITES:** Physics 341.

3. **GRADING:** The University policy on grading and related matters is described in sections F.1 and F.2 of the online University Calendar. In determining the final grade in the course, the following weights will be used:

- Assignments (best 10 of 12) – 40%
- In-class tests (3) – 36%
- Final exam – 24%

The in-class tests will be held on Thursdays 01-30, 02-27, and 03-27. Percentage grades will be given for all elements of term work and examinations. A weighted course percentage will be calculated for each student after the final exam is written, and a letter grade will be assigned according to the following conversion table:

Interval	Letter
95–100	A+
85–95	A
80–85	A-
75–80	B+
70–75	B
65–70	B-
60–65	C+
55–60	C
50–55	C-
40–50	D+
0–40	F

A grade of 45% or less in the final exam will result in a final course letter grade no higher than D+.

4. **MISSED COMPONENTS OF TERM WORK:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in section 3.6: <http://www.ucalgary.ca/pubs/calendar/current/sc-3-6.html>. It is the student’s responsibility to familiarize himself/herself with these regulations. See also <http://www.ucalgary.ca/pubs/calendar/current/e-3.html>.

5. **TEXTBOOK:** Analytical Mechanics, Fowles & Cassiday, 7th. ed., Thomson – BrooksCole.
6. **EXAMINATION POLICY:** Calculators are allowed. Students are encouraged to read the Calendar, Section G, on Examinations: <http://www.ucalgary.ca/pubs/calendar/current/g.html>.
7. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**
  - (a) **ACADEMIC MISCONDUCT** (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. *A single offence may lead to disciplinary probation or suspension or expulsion.* The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under K. Student Misconduct (<http://www.ucalgary.ca/pubs/calendar/current/k.html>) to inform yourself of definitions, processes and penalties.
  - (b) **ASSEMBLY POINTS IN CASE OF EMERGENCY DURING CLASS TIME:** Be sure to familiarize yourself with the information at <http://www.ucalgary.ca/emergencyplan/assemblypoints>.
  - (c) **ACADEMIC ACCOMMODATION POLICY:** Students with documentable disabilities are referred to the following links:  
Calendar entry on students with disabilities: <http://www.ucalgary.ca/pubs/calendar/current/b-1.html>  
Disability Resource Centre: <http://www.ucalgary.ca/drc/>
  - (d) **SAFEWALK:** Campus Security will escort individuals day or night. Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
  - (e) **FREEDOM OF INFORMATION AND PRIVACY:** This course will be conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. See <http://www.ucalgary.ca/sec-retariat/privacy>.
  - (f) **STUDENT UNION INFORMATION:**  
VP Academic: Phone 220-3911, email [suypaca@ucalgary.ca](mailto:suypaca@ucalgary.ca).  
SU Faculty Rep.: Phone 220-3913, email [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca)  
website <http://www.su.ucalgary.ca/home/contact.html>.  
Student Ombudsman: <http://www.su.ucalgary.ca/services/student-services/student-rights.html>.
  - (g) **INTERNET AND ELECTRONIC COMMUNICATION DEVICE INFORMATION:**  
You can assume that in all classes that you attend, your cell phone should be turned off. Also, communication with other individuals, via laptop computers, Blackberries, or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

## Syllabus

- Dynamics of systems of particles: Centre of mass and linear momentum, angular momentum and kinetic energy of a system; collisions; rocket motion.
- Mechanics of rigid bodies - Planar motion: Rigid body rotation about a fixed axis; moment of inertia; laminar motion of a rigid body; impulse and collisions involving rigid bodies.
- Motion of bodies in 3 dimensions: Rotation of a rigid body about an arbitrary axis; principal axes of a rigid body; Euler's equation; free rotation of a rigid body; gyroscopic motion.
- Lagrangian mechanics: Hamilton's principle; The Euler-Lagrange equations.
- Dynamics of oscillating systems: Stability; system with one degree of freedom; coupled harmonic oscillators; general theory of vibrating systems; a linear array of couple HO's; the wave equation.