

UNIVERSITY OF CALGARY
DEPARTMENT OF PHYSICS and ASTRONOMY
COURSE OUTLINE

1. Physics 609, Advanced Classical Mechanics

Lecture Sections: **L01:** TuTh, 09:30-10:45, Social Sciences 117

Instructor, D.W. Hobill

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Office Hours: M W 10:00-11:30

Departmental Office location: SB 605, telephone no.: (403)-220-5385

2. PREREQUISITES: Background should include Physics 343 and or equivalent

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

| | |
|-------------------|--|
| Assignments | 40% |
| Midterm test | 20% (See Syllabus for date) |
| Final Examination | 40% (To be scheduled by the Registrar) |

Percentage grades will be given for all elements of term work and examinations in Physics 369. A weighted course percentage will be calculated for each student after the final exam is written. A table of conversion from final course percentage to final course letter grade will be provided later in the term.

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. REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a clash with this out-of-class-time-activity, please inform your instructor as soon as possible so that alternative arrangements may be made for you.

6. TEXTBOOK: *Classical Mechanics*, (3rd Edition), H. Goldstein, C. Poole and J. Safko, Addison Wesley

7. EXAMINATION POLICY: Students are encouraged to read the Calendar, Section G, on Examinations: <http://www.ucalgary.ca/pubs/calendar/current/g.html>.

Department Approval _____ Date _____

8. 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 (<http://www.ucalgary.ca/security/safewalk/>). 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. For more information see also <http://www.ucalgary.ca/secretariat/privacy>.

- (f) **STUDENT UNION INFORMATION:** VP Academic Phone: 220-3911 Email: suvpaca@ucalgary.ca.
SU Faculty Rep. Phone: 220-3913 Email: 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>

- (i) **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.

Course Syllabus

Topics to be covered in this course are:

1. Review of classical mechanics
2. Variational Principles and Lagrange's Equations
3. Examples (particle and extended rigid body motion)
4. Hamilton's equations of motion
5. Hamilton-Jacobi Theory

Topics to be covered time permitting:

Chaotic dynamics of nonlinear systems

Relativistic mechanics

Classical Mechanics and its relation to quantum mechanics

Classical Field Theory

There will be one (in-class) mid-term examination in late October or early November.

The final exam will consist of two parts:

(a) a "take home" part and (b) a shorter (3hr) exam to be scheduled by the Registrar during the final exam period.