

UNIVERSITY OF CALGARY
DEPARTMENT OF PHYSICS and ASTRONOMY
COURSE OUTLINE

1. **Physics 221, Mechanics.**

Lecture Sections:

L01: MWF 0800-0850 EDC 179 **Instructor:** Dr. Jörn Davidsen **Office:** SB 505 **Office Hours:** W 15:00-17:00 in ST 025
Tel. No.: 210-7964 **e-mail:** davidsen@phas.ucalgary.ca

L02: MWF 1200-1250 EDC 179 **Instructor:** Dr. Rachid Ouyed **Office:** SB 537 **Office Hours:** M 08:30-10:30 in SB 537
Tel. No.: 210-8418 **e-mail:** ouyed@phas.ucalgary.ca

L03: MWF 1600-1650 EDC 179 **Instructor:** Dr. Jo-Anne Brown **Office:** SB 527 **Office Hours:** W 17:00-19:00 in ST 025
Tel. No.: 220-8014 **e-mail:** jocat@ras.ucalgary.ca

Course Coordinator: Dr. Bill Wilson **Office:** SB 531 **Tel. No.:** 220-6088 **e-mail:** wjfwilso@ucalgary.ca

Course Website: <http://webapps3.ucalgary.ca/~dppvan/phys211-221/>

Blackboard Course: PHYS 211/221 L01/L02/L03 - (Fall2010) - Mechanics.

Physics and Astronomy Office: SB 605 **Tel. No.:** 220-5385 e-mail contact address

2. **PREREQUISITES:** A grade of 70% or higher in physics 30; 50% or higher in Mathematics 31; and 70% or higher in Pure Mathematics 30 or a grade of "B-" or above in Mathematics II (offered by Continuing Education).

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:

Laboratorials	14%	
Assignments (MyMathTest & MasteringPhysics)	14%	
Classroom Clicker Activity	2%	
TwoTerm Tests (see item 5 below)	40%	(Tests and final exam are closed book. Calculators are allowed, but must not be used for text storage.)
Final Examination*	30%	
	100%	
Bonuses: Diagnostic Tests		1% (maximum bonus)

Students who receive a weighted mean mark <40% over the two term tests and the Final Examination should not expect to receive a course grade higher than "D+".

In Physics 221 we are using: Percentage grades will be given for all elements of term work and examinations in Physics 221. 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 has been published under Course Information on the Phys 221 Blackboard site.

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. Dates and times of class exercises to be held outside of class hours: **Term Test 1 Fri Oct. 15, 17:30 – 19:30 (5:30-7:30 p.m.).**
Term Test 2 Fri Nov. 19, 17:30 – 19:30 (5:30-7:30 p.m.).

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:** "Physics for Scientists and Engineers: A Strategic Approach", by Randall D. Knight, 2nd Ed., Addison-Wesley

7. **EXAMINATION POLICY:** Examinations are closed book. Calculators must not have wireless communication. Students are encouraged to read the Calendar, Section G, on Examinations: <http://www.ucalgary.ca/pubs/calendar/current/g.html>.

10. **HUMAN STUDIES:** The Department of Physics and Astronomy is conducting research into the effectiveness of our teaching. This research includes evaluating student performance and improvement in Physics 221; see the information page "Evaluation of Learning Outcomes in Physics 211/221" on Blackboard. See also <http://www.ucalgary.ca/pubs/calendar/current/e-5.html>.

Department Approval  Date Sept 13/10

Associate Dean's Approval for out of regular class-time activity:  Date: Sept 14/10

11. 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 (FOIPPA). 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.

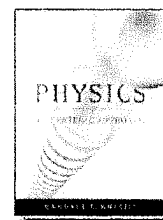
In Phys 221 we post 10 additional documents in the Course Information folder on the Physics 211/221 Blackboard site. One of these documents is a week-by-week schedule of topics, text references, assignment due dates, labatorial topics, and other information. This schedule is reproduced below. Another provides a conversion chart between the final percentage course mark and the course letter grade; and the other eight provide information about the textbook, clickers, and the Web-based assignments.

Course Syllabus



University of Calgary
Dept. of Physics and Astronomy
Physics 211/221

Your Phys 211/221 textbook.
This outline lists text sections that
will be covered week-by-week.



Fall, 2010. Phys 211/221 Week-by-week Course Schedule

Week 1 Sep 13-17

- 1.1 Motion diagrams
- 1.2 The particle model
- 1.3 Position and Time
- 1.4 Velocity

No laboratorials in Week 1.

Do **Assignment 1: Math Review** on-line
by 11:59 pm **Sun, Sep 19.**

Week 2 Sep 20-24

- 1.5 Linear Acceleration
- 1.6 Motion in One Dimension
- 1.7 Solving Problems in Physics
- 1.8 Units and significant figures
- 2.1 Uniform motion
- 2.2 Instantaneous velocity

Laborial 1: Units, Equipment, Motion Diagrams

Do **Assignment 2** on-line by 11:59 pm **Wed, Sep 22.**

Do **Diagnostic Test** on-line by 11:59 pm **Sun, Sep 26.**

Week 3 Sep 27-Oct 1

- 2.3 Finding position from velocity
- 2.4 Motion with constant acceleration
- 2.5 Free fall
- 2.6 Motion on an inclined plane
- 2.7 Instantaneous acceleration
- 3.1 Vectors
- 3.2 Properties of vectors
- 3.3 Coordinate systems and vector components

Laborial 2: Measuring Motion

Last Day to Register Clickers: Mon, Sep 27.

Assignment 3: 11:59 pm Wed, Sep 29.

Week 4 Oct 4-8

- 3.4 Vector algebra
- 4.1 Acceleration
- 4.2 Kinematics in two dimensions
- 4.3 Projectile Motion
- We do not cover 4.4 Relative motion*
- 4.5 Uniform circular motion

Laborial 3: Inclined Plane

Assignment 4: 11:59 pm Wed, Oct 6.

Monday, Oct 11, is Thanksgiving Day: No Lecture.

Week 5 Oct 12-15

- 4.5 Uniform circular motion (continued)
- 4.6 Velocity and acceleration in uniform circular motion

Labs: Open Tutorial for Midterm Preparation

Assignment 5: 11:59 pm Wed, Oct 13.

****IMPORTANT: Term Test 1 on evening of Friday, Oct 15**

Week 6 Oct 18-22

- 4.7 Non-uniform circular motion (we cover **only** p. 113 and Example 4.15 on p. 114)
- 5.1 Force
- 5.2 A short catalog of forces
- 5.3 Identifying forces
- 5.4 What do forces do? A virtual experiment
- 5.5 Newton's Second Law
- 5.6 Newton's First Law
- 5.7 Free-Body Diagrams
- 6.1 Equilibrium
- 6.2 Using Newton's Second Law

Laborial 4: Two Dimensional Motion

Assignment 6: 11:59 pm Wed, Oct 20.

continued on page 2...

Week 7 Oct 25-29

- 6.3 Mass, weight, and Gravity
- 6.4 Friction
- 6.5 Drag
- 6.6 More examples of Newton's Second Law
- 7.1 Interacting Objects
- 7.2 Analyzing Interacting Objects

Laboratorial 5: Statics

Assignment 7: 11:59 pm Wed, Oct 27.

Week 8 Nov 1-5

- 7.3 Newton's Third Law
- 7.4 Ropes and pulleys
- 7.5 Examples of interacting-object problems
- 8.1 Dynamics in two dimensions
- 8.2 Velocity and acceleration in uniform circular motion (a review of sec. 4.6)
- 8.3 Dynamics of uniform circular motion

Laboratorial 6: Newton's 2nd Law

Assignment 8: 11:59 pm Wed, Nov 3.

Week 9 Nov 8-10

- 8.4 Circular orbits
- We do not cover 8.5 Fictitious forces*
- 8.6 Why does the water stay in the bucket?
- 8.7 Non-uniform circular motion
- 9.1 Momentum and Impulse
- 9.2 Solving impulse and momentum problems
- 9.3 Conservation of momentum

No Laboratorial

Assignment 9: 11:59 pm Wed, Nov 10.

Nov 11-14 are Reading Days. No lectures Nov 11-12. Laboratorials cancelled Nov 8-12.

Week 10 Nov 15-19

- 9.4 Inelastic collisions
- 9.5 Explosions
- 9.6 Momentum in Two Dimensions

**Labs: Open Tutorial for Midterm Preparation
No Assignment**

****IMPORTANT: Term Test 2 on evening of Friday, Nov. 19**

Week 11 Nov 22-26

- 10.1 10.2 Kinetic energy and gravitational potential energy
- 10.3 A closer look at gravitational potential energy
- 10.4 Restoring forces and Hooke's Law
- 10.5 Elastic potential energy

Laboratorial 7: Newton's 3rd law

Assignment 10: 11:59 pm Wed, Nov 24.

Week 12 Nov 29-Dec 3

- 10.6 Elastic collisions
- 10.7 Energy diagrams
- 11.1 The basic energy model
- 11.2 Work and kinetic energy
- 11.3 Calculating and using work
- 11.4 The work done by a variable force
- 11.5 Force, work, and potential energy
- We do not cover 11.6 Finding force from PE*
- 11.7 Thermal energy
- 11.8 Conservation of energy

Laboratorial 8: Collisions

Assignment 11: 11:59 pm Wed, Dec 1.

Do 2nd Diagnostic Test on-line Dec 2-10.

Week 13 Dec 6-10

- 11.9 Power
- 12.5 Torque
- 12.8 Static equilibrium

Laboratorial 9: Conservation of Energy

**Assignment 12: 11:59 pm Wed, Dec 8.
Do 2nd Diagnostic Test on-line by Dec 10.**

Lectures end Friday, December 10.