UNIVERSITY OF CALGARY
DEPARTMENT OF PHYSICS and ASTRONOMY
COURSE OUTLINE

1. **Physics 211, Mechanics**

   Lecture Sections:

   L01: MW 12:00-14:40; F 14:00-15:50, SA 106. **Instructor:** Dr. Alexander Lvovsky, Office SB 319, Tel. 220-4124, e-mail: LVOV@ucalgary.ca, Office Hours: 1 hour after each lecture

   Physics and Astronomy Office: SB 605, Tel. 220-5385, e-mail office@phas.ucalgary.ca.
   Blackboard Course: PHYS 211 AND 221 L20 – (SPRING 2012) – MECHANICS.
   Mastering Physics Course ID: LVOVSKY2012.
   Top Hat Monocle Course URL: http://ca.tophatmonocle.com/e870321.

2. **PREREQUISITES:** Pure Mathematics 30 or Mathematics II (offered by Continuing Education). Note: Physics 30 is recommended as preparation for Physics 211. Physics 211 is not open to students with 70% or higher in Physics 30 and Pure Mathematics 30 and 60% or higher in Mathematics 31, except with Departmental permission.

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:

Labatorials	20%	
Assignments (MasteringPhysics)	18%	
Classroom Response Activity	2%	
Two Term Tests	30%	(Tests and final exam are closed book. Calculators
Final Examination*	30%	are allowed, but must not be used for text storage.)
	100%	

   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+".

   Percentage grades will be given for all elements of term work and examinations in Physics 211. 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 211 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. **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 much not have wireless communication. Students are encouraged to read the Calendar, Section G, on Examinations: **http://www.ucalgary.ca/pubs/calendar/current/g.html**.

Department Approval_____ **Date**_____

Associate Dean's Approval for
out of regular class-time activity: _____ **Date:**_____

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 (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@ucagary.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.

PLEASE SEE BLACKBOARD (Section "Course Documents") FOR FURTHER INFORMATION.

Course Syllabus

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

Lectures begin Wednesday May 09

1.1 Motion diagrams
1.2 The particle model
1.3 Position and time
1.4 Velocity
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
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
3.4 Vector algebra

Midterm 1 on Wednesday May 23

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
4.6 Velocity and acceleration in uniform circular motion

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
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
7.3 Newton's Third Law
7.4 Ropes and pulleys
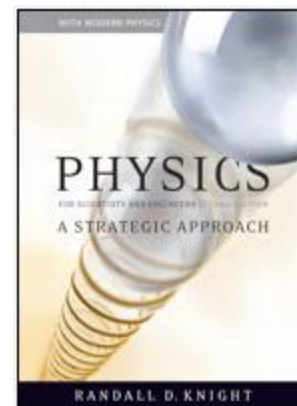
7.5 Examples of interacting-object problems

Midterm 2 on Wednesday June 6

8.1 Dynamics in two dimensions
8.2 Velocity and acceleration in uniform circular motion
8.3 Dynamics of uniform circular motion
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
9.4 Inelastic collisions
9.5 Explosions
9.6 Momentum in two dimensions

10.1 A "natural money" called energy
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
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 potential energy
11.7 Thermal energy
11.8 Conservation of energy
11.9 Power

Lectures end Friday, June 22.

Final exams on June 25-27 (to be scheduled by the Registrar)