UNIVERSITY OF CALGARY

DEPARTMENT OF PHYSICS AND ASTRONOMY
COURSE OUTLINE

1. **Course:** Physics 221, Mechanics

L01: MWF	12:00-12:50 CHC 119	Andrew W Yau | SB 623 |yau@ucalgary.ca| 403-220-8825
L02: MWF	16:00-16:50 CHC 119	Dr. Sean Stotyn| SA 101C|sean.stotyn@ucalgary.ca|403- 210-7594

Course Coordinator: Dr. Marzena Kastyak-Ibrahim| SB 507 | marzena.kastyakibrah@ucalgary.ca | 403-220-8073
D2L Course PHYS 211 L01-L03/ PHYS 221 L01-L02 - (Fall 2017)
PHYS 211/221 B01-B46 - (Fall 2017) - Laboratorials
Departmental Office: SB 605, 403-220-5385, phasugrd@ucalgary.ca
Office Hours: Each Instructor will make their office time known via D2L or in lecture.

Office hours (Drop-in Hours): Wed 9:00 – 11:00 am & 1:30-3:30 pm, Room ST 025

Prerequisites: Mathematics 30-1 or Pure Mathematics 30 or Mathematics II (offered by Continuing Education). Note: Physics 30 is recommended as preparation for Physics 211.

2. **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 (10)	10%
Laboratory experiments (8)	15%
Activities	10%
In-class quizzes	15%
Midterm test	20% (October 24, 2017; 19:00-21:00, Location TBA on D2L)
Final Examination	30% (To be scheduled by the Registrar)

A student's final letter grade will be determined using the percentage to letter grade conversion scale below unless that student falls within the following exception: if the student's overall course grade is greater than 50%, but the student receives less than 50% weighted average on the quizzes, midterm and final examination OR receives 0% on the final exam, the student will receive a D in the course.
Percentage to letter grade conversion scale:

> = 95 %	A +	> = 80 %	B +	> = 65 %	C +	> = 50 %	D +
> = 90 %	A	> = 75 %	B	> = 60 %	C	> = 45%	D
> = 85%	A -	> = 70 %	B -	> = 55 %	C -	< 45 %	F

As your term work items (labs, assignments and exams) accumulate, the marks for students in Phys 221 will be posted on D2L. The marks that appear on this website are the marks that will be used to determine each student's overall course grade. Check your marks frequently. **Missing or incorrectly posted term work marks should be reported to your Instructor as soon as they are noticed.** You should be prepared to produce the original work to verify the requested correction.

3. **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. It is the student's responsibility to familiarize himself/herself with these regulations. See also Section E.6 of the University Calendar

Missed midterm

Students who miss the midterm because of ill health, or for other valid reasons, will most often be granted an excused absence by the Course Coordinator provided that alleged problems are supported in writing by a person in a position of authority (physician, counselor, etc.). In the case of a missed exam due to illness, students must fill in the form Missed Midterm (Excel file, should be saved as an Excel file) posted on D2L (Folder: Forms missed lab or exam) and email it to Dr. Kastyak-Ibrahim along with the note preferably the day of the exam, but no later than 11:59 pm the day after the exam. Once the claim of illness is substantiated, **the weight of the midterm will be shifted to the final exam.**

Missed Labatorials

Students are NOT allowed to attend a different labatorial section than the one in which they are registered. A make-up lab session will be scheduled in the last week of classes. You can make-up one labatorial. Priority for scheduling a make-up lab will be given to students who missed a lab for a legitimate reason. A note from a physician/counsellor should be provided. Please fill in the form Make-up lab request (Excel file, should be saved as an Excel file) posted on D2L (Folder: Forms missed lab or exam) and email it to Dr. Kastyak-Ibrahim, the Undergraduate Learning Coordinator at **marzena.kastyakibrah@ucalgary.ca** in order to arrange for a make-up labatorial as soon as you know that you might need one. Requests submitted more than 7 days after the date of the missed lab will not be considered.

Missed assignments:

Please contact Dr. Kastyak-Ibrahim, the Undergraduate Learning Coordinator at phasulc@ucalgary.ca if you have a legitimate reason for missing a deadline for an assignment. Sleeping in, forgetting about the deadline etc. is NOT considered a legitimate reason.

Missed in-class quizzes:

There are no make-ups for in class quizzes. If you have a legitimate reason for missing in-class quiz, please fill in the form Missed Quiz (Excel file, should be saved as an Excel file) posted on D2L (Folder: Forms missed lab or exam) and email it to Dr. Kastyak-Ibrahim along with the note the day of the quiz, at the latest. Once the claim is substantiated, the weight of the quiz will be shifted to the midterm (Quiz 1) or the final exam (Quiz 2). Sleeping in, missing the bus etc. is NOT considered a legitimate reason.

5. **Scheduled out-of-class activities:**

Tuesday October 24, 2017, 19:00-21:00: Mid-term Test. Location to be announced on D2L.

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 the Course Coordinator as soon as possible so that alternative arrangements may be made for you. Students are expected to make every effort to attend the midterm exam. If you have a legitimate conflict, you must inform the course coordinator **at least 2 weeks prior** to the exam dates so that alternative arrangements may be made.

6. **Course Materials:** *R.D. Knight, Physics for Scientists and Engineers: A Strategic Approach, 4th Edition, Addison-Wesley.*

7. **Examination Policy**: Closed book exam and mid-term test with formula sheet provided; calculator allowed; Students should also read the Calendar, Section G, on Examinations.

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 Section K. Student Misconduct 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 on assembly points.

(c) **Academic Accommodation Policy:** Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf. Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of the Department of Physics and Astronomy, Dr. David Feder, by email (dfeder@ucalgary.ca) or by phone (403. 220.3638).

(c) **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.

(d) **Freedom of Information and Privacy:** This course is 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.

(e) **Student Union Information:** VP Academic Phone: 220-3911 Email: suvpaca@ucagary.ca. SU Faculty Rep. Phone: 220-3913 Email: sciencerep@su.ucalgary.ca; Student Ombudsman

(f) **Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. 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.

(g) **USRI:** At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference - please participate in USRI Surveys.

(h) **STUDENT ADVOCACY INFORMATION:** Website: http://www.su.ucalgary.ca. Student Ombudsman: http://www.ucalgary.ca/provost/students/ombuds

(i) **COURSE INCOMES:**

Students coming into PHYS 221 should be able to:

- Demonstrate ability to solve the quadratic formula
- Use trigonometry and basic geometry to solve problems
- Employ basic algebraic manipulations
- Perform derivatives of simple functions
- Recognize elementary principles of kinematics and dynamics

(j) COURSE OUTCOMES:

Upon completion of the course students should be able to:

- Apply vector notation and algebra in kinematics and dynamics problems in one and two dimensions
- Develop mathematical models of physical situations.
- Exploit and use principle of conservation of energy and momentum.
- Carry out calculations symbolically (in terms of physical variables) and numerically (using appropriate values and their units)
- Obtain and analyze experimental data, and relate them to physical laws governing kinematics and dynamics.
- Communicate and collaborate effectively within a team environment.

(k) LABATORIALS

Labatorials begin Monday, Sep 18, 2017. They take place in ST 030 and 032, and students will have been assigned to a particular room, on a particular day of the week, by the Registrar's Office when enrolling in Physics 211/221. In general, the format of the laboratorials is as follows: Working in groups, students make their way through a carefully written workbook crafted to help students ponder, discuss, and learn concepts being covered in their lectures. TAs offer assistance and guidance, and check student understanding periodically throughout the session. Laboratorials typically involve a class demonstration, computer simulations, or some apparatus, and the tasks presented to students vary accordingly.

The Laboratorials workbook documents will be available on D2L. Students are to print out their own copies and take them to their Laboratorials section to do their work.
It is the student's responsibility to ensure their Laboratorials marks as posted on D2L are correct. A student's Laboratorials mark will not be revised in the D2L gradebook if a period of more than 15 days has passed since the student performed the Laboratorial.

Physics 211/221 Labatorial Schedule – Fall 2017

Week	Dates	Labatorial
1	Sep 11-15	NO LABATORIALS
2	Sep 18-22	Labatorial 1 Vectors in 1D and 2D
3	Sep 25-29	Labatorial 2 Inclined plane
4	Oct 2-6	Labatorial 3 Projectile motion
5	Oct 9-13	NO LABATORIALS (Thanksgiving week)
6	Oct 16-20	Labatorial 4 Circular motion
*** Midterm Exam – Tuesday October 24th ***		
7	Oct 23-27	NO LABATORIALS (Midterm week)
8	Oct 30- Nov 3	Labatorial 5 Newton's 1st and 2nd Law
9	Nov 6-9	Labatorial 6 Statics
10	Nov 14-17	NO LABATORIALS (Nov 13 is off)
11	Nov 20-24	Labatorial 7 Conservation of energy
12	Nov 27 -Dec 1	Labatorial 8 Conservation of momentum
13	Dec 4 - 8	NO LABATORIALS (Make-up labatorials)
Dec 4 Make-up labatorials		

(I) MASTERING PHYSICS On-line ASSIGNMENTS

If you have a MasteringPhysics account, **Sign In** at http://www.masteringphysics.com and enter your Username and Password. If you cannot remember your username or your password, click Forgot your username or password? and enter the email address you used to register for MasteringPhysics. Your login name and password will be sent to your email. Enter your **U of C Student ID**.

If you don't have a MasteringPhysics account but have purchased the textbook package with MasteringPhysics or purchased digital access from the bookstore:

- Go to http://www.masteringphysics.com and click **Students** under **Register Now** then click **OK! Register now**.
- Enter Course ID - **PHYS211221FALL2017**

a. Select the appropriate option under **Do you have a Pearson Education account**? (**Note**: if you have used Pearson MyLab/Mastering at U of C you will have an account):

   i. If **Yes**, Sign In with your username/password. Can't remember? Click Forgot your username or password?.

   ii. If **No**, choose **Create a Pearson Account**, fill out the required information and click **Create Account**.

b. Under **Select an Option**, click **Use an Access Code** and enter it. IMPORTANT – if you **do not have** an Access Code and want to purchase digital access to MasteringPhysics (with or without eText) purchase from the bookstore **eBooks and Access Codes** - https://www.calgarybookstore.ca/digital2.asp? Do not purchase during this registration process as pricing is in US dollars. Bookstore pricing is in CDN dollars.

c. The **Confirmation & Summary** page confirms your registration. This information will also be emailed to you for your records. You can either click **Log In Now** or return to www.masteringphysics.com later.

If you choose to just access the MasteringPhysics assignments without purchasing access to the study materials or eText please email Pearson at ucphysics.mastering@gmail.com to get an access code and registration instructions. You will have access only to assignments and access

Once you have registered in MasteringPhysics, **Join a Course** by entering the MasteringPhysics Course ID – **PHYS211221FALL2017**

Physics 211/221 Assignment Schedule – Fall 2017

Week	Dates	Assignment	Available	Due Date
1	Sep 11-15	Assignment 0	Monday, September 11, 2017	Monday, September 18, 2017
2	Sep 18-22	Assignment 1	Wednesday, September 13, 2017	Wednesday, September 20, 2017
3	Sep 25-29	Assignment 2	Wednesday, September 20, 2017	Wednesday, September 27, 2017
4	Oct 2-6	Assignment 3	Wednesday, September 27, 2017	Wednesday, October 04, 2017
5	Oct 9-13	Assignment 4	Wednesday, October 04, 2017	Wednesday, October 11, 2017
6	Oct 16-20	Assignment 5	Wednesday, October 11, 2017	Wednesday, October 18, 2017
*** Midterm Exam – Tuesday October 24th ***				
7	Oct 23-27	Practice (midterm)	Wednesday, October 18, 2017	Wednesday, October 25, 2017
8	Oct 30- Nov 3	Assignment 6	Wednesday, October 25, 2017	Wednesday, November 01, 2017
9	Nov 6-9	Assignment 7	Wednesday, November 01, 2017	Wednesday, November 08, 2017
10	Nov 14-17	Assignment 8	Wednesday, November 08, 2017	Wednesday, November 15, 2017
11	Nov 20-24	Assignment 9	Wednesday, November 15, 2017	Wednesday, November 22, 2017
12	Nov 27 -Dec 1	Assignment 10	Wednesday, November 22, 2017	Wednesday, November 29, 2017
13	Dec 4 - 8	Practice (final)	Wednesday, November 29, 2017	Wednesday, December 06, 2017

(k) Activities

In order to help students to better understand and learn course material there will be additional activities. Participation will earn students 10% toward their overall course grade.

- 4% for pre-reading quizzes (due every Sunday). Quizzes will be available on Thursday on Mastering Physics
- 3% for in class group activities and problem solving (TopHat Group)
- 3% for individually answered TopHat questions (Top Hat Individual)

TopHat system is an on-line tool used as a vehicle to encourage class participation and student interaction as well as providing instructors with rapid, in-class feedback. A demonstration of this system could happen in your lecture section in the first week of classes.

Each lecture section will have two TopHat course names which will be given to you by your instructor. One will be used for group activities, the other one for questions encouraging participation.

The type and number of response questions you will encounter over the semester is at the sole discretion of your instructor. If students make any attempt to answer a question they get 1 mark, and if they get the answer correct they get 1 more mark. Such questions are worth 2 marks. For group activities questions asked will have a specific correct answer and only the mark for correct answer will be assigned.

Physics 211/221 Lecture Schedule – Fall 2017

Week	Dates	Topics	Labatorial	Assignment
1	Sep 11-15	1.8 Units and significant figures	NO LABATORIALS	Assignment 0
		3.1 Scalars and vectors		
		3.2 Using vectors		
		3.3 Coordinate systems and vector components		
		3.4 Unit vectors and vector algebra		
2	Sep 18-22	1.1 Motion diagrams	Labatorial 1	Assignment 1
		1.2 Models and modelling		
		1.3 Position, Time and displacement		
		1.4 Velocity		
		1.5. Linear acceleration		
		1.6 Motion in One Dimension		
		1.7 Solving Problems in Physics		
		2.1 Uniform motion		
		2.2 Instantaneous velocity		
		2.3 Finding position from velocity		
3	Sep 25-29	2.4 Motion with constant acceleration	Labatorial 2	Assignment 2
		2.5 Free fall		
		2.6 Motion on an inclined plane		
		2.7 Instantaneous acceleration		
		4.1 Motion in two dimensions		
		4.2 Projectile Motion		
		We do not cover 4.3 Relative motion		
*** In-class Quiz 1 – Monday October 2nd ***				
4	Oct 2-6	4.4 Uniform circular motion	Labatorial 3	Assignment 3
		4.5 Centripetal acceleration		
		4.6 Non-uniform circular motion		
Oct 9 Thanksgiving Day. No lectures. University is closed				
5	Oct 9-13	5.1 Force	NO LABATORIALS (Thanksgiving week)	Assignment 4
		5.2 A short catalog of forces		
		5.3 Identifying forces		
		5.4 What do forces do?		
		5.5 Newton's Second Law		
		5.6 Newton's First Law		
		5.7 Free-Body Diagrams		
		6.1 Equilibrium model		
		6.2 Using Newton's Second Law		

Week	Dates	Topics	Labatorial	Assignment
6	Oct 16-20	6.3 Mass, weight, and Gravity	Labatorial 4	Assignment 5
		7.4 Ropes and pulleys		
		6.4 Friction		
		6.5 Drag		
		6.6 More examples of Newton's 2nd Law		
*** Midterm Exam – Tuesday October 24th 7-9 pm***				
7	Oct 23-27	7.1 Interacting Objects	NO LABATORIALS (Midterm week)	Practice assignment
		7.2 Analyzing Interacting Objects		
		7.3 Newton's Third Law		
		7.5 Examples of interacting-object problems		
8	Oct 30- Nov 3	8.2 Uniform circular motion	Labatorial 5	Assignment 6
		8.3 Circular orbits		
		8.4 "Why does Water Stay in the Bucket" subsection		
		8.5 Nonuniform circular motion		
9	Nov 6-9	12.1 Rotational motion	Labatorial 6	Assignment 7
		12.5 Torque		
		12.10 The vector description of rotational motion		
		12.8 Static equilibrium		
Nov 10-13 are Reading Days. No lectures on Nov 10 and 13. Nov 11th is Remembrance Day – University is closed				
10	Nov 14-17	9.1 Energy overview	NO LABATORIALS (Nov 13 is off)	Assignment 8
		9.2 Work and kinetic energy for a single particle		
		9.3 Calculating the work done		
		9.4 Restoring forces and the work done by a spring		
*** In-class Quiz – Monday November 20th ***				
11	Nov 20-24	9.5 Dissipative forces and thermal energy	Labatorial 7	Assignment 9
		9.6 Power		
		10.1 Potential energy		
		10.2 Gravitational potential energy		
		10.3 Elastic potential energy		
12	Nov 27 -Dec 1	10.4 Conservation of energy	Labatorial 8	Assignment 10
		10.5 Energy diagrams		
		10.6 Force and potential energy		
		10.7. Conservative and non-conservative forces		
		10.8 The energy principle revisited		
13	Dec 4 - 8	11.1 Momentum and Impulse	NO LABATORIALS (Make-up labatorials)	Practice assignment
		11.2 Conservation of momentum		
		11.3 Collisions		
		11.4 Explosions		

Department Approval_____Date_____

Associate Dean Approval_____Date_____