



UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS & ASTRONOMY
COURSE OUTLINE

1. **Course:** PHYS 221, Mechanics -- Spring 2018

Instructor Name	Email	Phone	Office	Hours
L01: (MW 12:00 - 14:45 in ENG 60 and F 14:00 - 15:50 in ENG 60)				
Marzena Kastyak- Ibrahim	marzena.kastyakibrah@ucalgary.ca	(403) 220-8073	SB 507	MW 3:00-4:00 PM

Course Site:

D2L: PHYS 211/221 L01 - (Spring 2018) - Mechanics
PHYS 211/221 Labs -ALL - (Spring 2018) - Mechanics

Department of Physics & Astronomy:

Office: Science B 605
Phone: 403 220-5385
Email: office@phas.ucalgary.ca

Note:

Students must use their U of C account for all course correspondence.

2. **Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

Prerequisite(s): A grade of 70 per cent or higher in Physics 30; 50 per cent or higher in Mathematics 31; and 70 per cent or higher in Mathematics 30-1 or Pure Mathematics 30 or a grade of "B-" or 70 per cent or better in Mathematics II (offered by Continuing Education).

Antirequisite(s): Credit for Physics 221 and 211 will not be allowed. Students may not register in, or have credit for, Physics 221 if they have previous credit for Physics 227 or are concurrently enrolled in Physics 227.

3. **Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Course component	Weight
Assignments	10 %
Laboratorials	15 %
Activities	15 %
In-class quiz	10 %
Midterm test (June 6, during the class)	20 %
Final examination	30 %

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Minimum % Required	95 %	90 %	85 %	80%	75%	70 %	65 %	60%	55%	50 %	45 %

A student's final letter grade will be determined using the percentage to letter grade conversion scale above 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 quiz, midterm and final examination OR receives 0% on the final exam, the student will receive a D in the course.

This course has a registrar scheduled final exam.

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.

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](#). It is the student's responsibility to familiarize himself/herself/themselves with these regulations. See also [Section E.3](#) 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 Laboratories

Students are NOT allowed to attend a different laboratory 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 laboratory. 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/counselor 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 at marzena.kastyakibrah@ucalgary.ca in order to arrange for a make-up laboratory as soon as you know that you might need one. Requests submitted more than **3 days** after the date of the missed lab will not be considered.

Missed assignments

Please contact Dr. Kastyak-Ibrahim at marzena.kastyakibrah@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 the in class quiz. 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. Sleeping in, missing the bus etc. is NOT considered a legitimate reason.

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

There are no scheduled out of class activities for this course.

In the Spring 2018 the quiz and midterm for this course session will be during regularly scheduled lectures.

6. **Course Materials:**

Recommended Textbook(s):

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

7. Examination Policy:

No aids are allowed on tests or examinations. Closed book exam and mid-term test with formula sheet provided; calculator allowed; Students should also read the Calendar, Section G, on Examinations.

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8. Approved Mandatory and Optional Course Supplemental Fees:

There are no mandatory or optional course supplemental fees for this course.

9. Writing across the Curriculum Statement:

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section [E.2](#) of the University Calendar.

10. Human studies statement:

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

11. Reappraisal of Grades:

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

1. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **15 days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a re-assessment of the work if, and only if, the student has sufficient academic grounds. See sections [I.1](#) and [I.2](#) of the University Calendar
2. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

12. OTHER IMPORTANT INFORMATION FOR STUDENTS:

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **Misconduct:** 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. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. **These are only examples.**
- c. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- d. **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 [procedure-for-accommodations-for-students-with-disabilities.pdf](#).

Students needing an accommodation in relation to their coursework or to fulfill 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 & Astronomy, Dr. David Feder by email phas.ahugrd@ucalgary.ca or phone 403-220-8127. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See [Section E.4](#) of the University Calendar.

- e. **Safewalk:** Campus Security will escort individuals day or night (See the [Campus Safewalk](#) website). Call [403-220-5333](#) for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). 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 [Legal Services](#) website.
- g. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](#) Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: [403-220-3913](#) Email: sciencerep@su.ucalgary.ca. Student Ombudsman, Email: suvpaca@ucalgary.ca.
- h. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
- i. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.
- j. **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see www.ucalgary.ca/wellnesscentre or call [403-210-9355](#).

LABATORIALS

Laboratorials begin on Thursday May 17, 2018. They take place in ST 030 and 032, and students will have been assigned to a particular room 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.

PHYS 211/221 Labatorial Schedule - Spring 2018

Date	Labatorial number and topic
May 17, 2018	Labatorial 1 Motion diagrams
May 22, 2018	Labatorial 2 Inclined plane
May 24, 2018	Labatorial 3 Projectile motion
May 29, 2018	Labatorial 4 Circular motion
May 31, 2018	Labatorial 5 Newton's 1 st and 2 nd Law
June 7, 2018	Labatorial 6 Statics
June 12, 2018	Labatorial 7 Work-Kinetic Energy Theorem
June 14, 2018	Labatorial 8 Conservation of energy
June 19, 2018	Labatorial 9 Conservation of momentum

MASTERING PHYSICS On-line ASSIGNMENTS

How to access MasteringPhysics:

- Go to <http://www.masteringphysics.com> and click "Student" under Register Here
- Click "OK Register Now"
- Enter your Course ID: **PHYS211221SPRING2018**
- Sign in if you already have a Pearson account (perhaps you used MasteringAstronomy, MathXL, MyStatLab, etc. in another course). If you don't already have a Pearson account then you can create one here.
- Select "Access Code" if you have an access code that came in your textbook package or that you purchased separately from the bookstore. You can also buy access at this point.
- Copy and paste your access code into the field provided.
- Click "Enter My Course"
- To join your instructors course, select "Yes" and enter the Course ID: **PHYS211221SPRING2018**
- Enter your U of C Student ID
- Congratulations you are now ready to use MasteringPhysics!

If you choose to access your MasteringPhysics assignments without purchasing access:

Mastering Physics includes an electronic version of your textbook which can be used on a computer or in an app on your smart phone or tablet. It also includes access to a Study Area which includes video demonstrations, MCAT prep quizzes, simulations, app based study modules and more. If you are not interested in the electronic book or additional resources and only in access to the homework assignments please email Pearson at **ucphysics.mastering@gmail.com** to get an access code and registration instructions. Note, the code for assignment only version is only valid for one term, so if you got one in the past you need to request it again. Once you have registered in MasteringPhysics, with these emailed instructions. Join a Course by entering the MasteringPhysics Course ID - **PHYS211221SPRING2018**.

PHYS 211/221 Assignment Schedule - Spring 2018

Assignment	Available	Due Date
Assignment 1	Monday, May 14, 2018	Friday, May 18, 2018
Assignment 2	Wednesday, May 16, 2018	Wednesday, May 23, 2018
Assignment 3	Wednesday, May 23, 2018	Wednesday, May 30, 2018
Midterm PRACTICE	Wednesday, May 30, 2018	Wednesday, June 06, 2018
Assignment 4	Wednesday, June 06, 2018	Wednesday, June 13, 2018
Assignment 5	Wednesday, June 13, 2018	Wednesday, June 20, 2018
Final PRACTICE	Wednesday, June 20, 2018	Wednesday, June 27, 2018

ACTIVITIES

In order to help students to better understand and learn course material there will be additional activities. Participation will earn students 15% toward their overall course grade.

- 4% for pre-reading quizzes (due on Mondays). Quizzes will be available on Thursdays.
- 6% for in class group activities and problem solving (TopHat Group)
- 5% 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.

PHYS 211/221 Pre-reading Schedule - Spring 2018

Pre-reading	Available	Due Date
Pre-reading 1	Thursday, May 17, 2018	Monday, May 21, 2018
Pre-reading 2	Thursday, May 24, 2018	Monday, May 28, 2018
Pre-reading 3	Thursday, June 07, 2018	Monday, June 11, 2018
Pre-reading 4	Thursday, June 14, 2018	Monday, June 18, 2018

PHYS 211/221 Lecture Schedule - Spring 2018

Date	Topics
May 14, 2018	1.8 Units and significant figures
	3.1 Scalars and vectors
	3.2 Using vectors
	3.3 Coordinate systems and vector components
	3.4 Unit vectors and vector algebra
May 16, 2018	1.1 Motion diagrams
	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
May 18, 2018	2.4 Motion with constant acceleration
	2.5 Free fall
	2.6 Motion on an inclined plane
	2.7 Instantaneous acceleration
May 18, 2018	4.1 Motion in two dimensions
	We do not cover 4.3 Relative motion
	4.2 Projectile Motion
May 21 University closed	
May 23, 2018	4.4 Uniform circular motion
	4.5 Centripetal acceleration
	4.6 Non-uniform circular motion
	Problem solving
May 25, 2018 Quiz (In-class)	
May 28, 2018	5.1 Force
	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
May 30, 2018	6.1 Equilibrium model
	6.2 Using Newton's Second Law
	6.3 Mass, weight, and Gravity
	7.4 Ropes and pulleys
	6.4 Friction
	6.5 Drag
June 1, 2018	6.6 More examples of Newton's 2nd Law
	7.1 Interacting Objects
	7.2 Analyzing Interacting Objects
	7.3 Newton's Third Law
June 4, 2018	7.5 Examples of interacting-object problems
	8.2 Uniform circular motion
	8.3 Circular orbits
	8.4 "Why does Water Stay in the Bucket" subsection
	8.5 Nonuniform circular motion
Midterm review	
June 6, 2018 Midterm (in-class)	
June 8, 2018	12.1 Rotational motion
	12.5 Torque
	12.10 The vector description of rotational motion
	12.8 Static equilibrium
June 11, 2018	9.1 Energy overview
	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
June 13, 2018	9.5 Dissipative forces and thermal energy
	9.6 Power
	10.1 Potential energy
June 15, 2018	10.2 Gravitational potential energy
	10.3 Elastic potential energy
	10.4 Conservation of energy
June 18, 2018	10.5 Energy diagrams
	10.6 Force and potential energy
	10.7. Conservative and non-conservative forces
June 20, 2018	10.8 The energy principle revisited
June 22, 2018	Problem solving
June 25, 2018	11.1 Momentum and Impulse
	11.2 Conservation of momentum
	11.3 Collisions
June 25, 2018	11.4 Explosions
June 25, 2018	Problem solving
June 25, 2018	Final review

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

Department Approval:

Electronically Approved

Date: 2018-05-04 14:42

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.