



COURSE OUTLINE

1. **Course:** PHYS 221, Mechanics - Spring 2021

Lecture 01: MF 12:00 - 13:50 - Online and W 12:00 - 13:50 - Online and 14:00 - 15:50 - Online

Instructor	Email	Phone	Office	Hours
Dr. Ziad Abusara	zabusara@ucalgary.ca	403 220-3041	SB 130	Mon & Fri 10-11 AM

Online Delivery Details:

This course is being offered online in real-time via scheduled meeting times, you are required to be online at the same time.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

This course has a registrar scheduled, asynchronous final exam. The writing time is 2 hours + 50% buffer time, but the exam can be written any time in a 24-hour window.

Lectures

Every Monday from 12:00 - 13:45, the class will meet for an interactive lecture/question and answer session. This session will include answers to the questions received regarding the material from the previous week, as well as in-realtime questions administered via an online classroom response system (TOP HAT).

NOTE: Due to University Closing for **VICTORIA DAY (Monday, May 24th)**, the interactive lecture/question session regarding material from WEEK 03 will be held on Friday, **May 21th, 12:00-13:45**.

Laboratories

Laboratories will alternate between asynchronous and synchronous sessions. The sessions will be held during the laboratory slot scheduled according to the timetable.

During the **asynchronous** sessions, students are responsible for completing the individual portion (preliminary questions, designing, and completing an experiment according to the instructions in the laboratory manual). The individual laboratory reports are due at **21:59** on the day of the regularly scheduled laboratory session.

Synchronous sessions are designed for the completion of the group work in real-time - analysis of a selected video, discussion, answering questions posed in the write-up, and submission of the worksheet.

The schedule for all **Laboratory Activities** is shown in Table 1.

Synchronous Assessments

There are 5 synchronous assessments scheduled in the course. Each assessment is designed as a 30-minute quiz available during the Wednesday class slot (12:00 pm - 12:50 pm) starting on May 12th. The test needs to be started during the first 10 minutes of class and will remain open for 50 minutes from the moment it was commenced.

Course Site:

D2L: PHYS 221 L01-(Spring 2021)-Mechanics

Top Hat: www.tophat.com.

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

A) LABORATORIES

There will be two types of laboratory sessions - asynchronous ones dedicated to individual work and synchronous ones dedicated to group work.

The detailed laboratory schedule with due dates for individual and group components is listed in Table 1.

Table 1. Laboratory Schedule

Week	Laboratory	Individual Component Due date	Group Component Due Date
10 May - 14 May	Lab1: Introduction to Measurement and Video Analysis	Tuesday 11 May 2021, 21:59	Thursday, 13 May 2021, end of the lab session
17 May - 21 May	Lab2: Projectile Motion	Tuesday 18 May 2021, 21:59	Thursday, 20 May 2021, end of the lab session
24 May - 28 May	Lab3: Atwood Machine	Tuesday 25 May 2021, 21:59	Thursday, 27 May 2021, end of the lab session
31 May - 4 June	Lab4: Torque	Tuesday 1 June 2021, 21:59	Thursday, 3 June 2021, end of the lab session
7 June - 11 June	Lab5: Work and Energy	Tuesday 8 June 2021, 21:59	Thursday, 10 June 2021, end of the lab session

B) HOMEWORK

There are two types of homework in this course:

a) **Written assignments.** There will be five, equally-weighted assignments due weekly at 17:59 pm on Tuesdays, starting with Tuesday, May 18th. The assignments should present original and individual work. Grading of the assignments will be based on clarity and completeness of the method used to derive the answers and correctness of the answers including correct units. The illegible text and scratched-out sections of the assignments will not be marked.

b) **MyLabandMastering online assignments.** There will be five, equally-weighted assignments due weekly at 19:59 pm on Tuesdays, starting with Tuesday, May 18th.

To access/register to the online assignments:

1. Go to <https://www.pearsonmylabandmastering.com/northamerica/>
2. Under "**Register**" select "**STUDENT**"
3. Confirm you have the information needed then select "**OK! Register now**" .
4. Enter your instructor's course ID: **abusara84638** and "**Continue**" .
5. a) If you have an account (you ever used MyLab or Mastering products), enter your existing Pearson account username and password to "**Sign In**".

OR

5. b) If you do not have an account select "**Create**" and complete the required fields.
6. Enter the access code that came with your textbook.
7. From "**You're Done!**" page, select "**Go to My Courses.**" "
8. On the "**My Courses**" page, select the course name "**Spring 2021 - PHYS 211/221**" to start your work

C) ACTIVITY

Synchronous Top Hat Questions designed to help in understanding the material presented in a given chapter.

D) ASSESSMENTS

a) **Weekly Quizzes.** 5 weekly synchronous quizzes will be administered during the Wednesday lecture slot, according to the schedule in Table 2. The quizzes will be administered on "Quizzes" on D2L. Each quiz will consist of 6 questions of various formats (written problems, multiple-choice, matching), including both conceptual and arithmetic problems. Each quiz is expected to be completed in 30 minutes, but it will be accessible for 50 minutes from the time it is opened. The quizzes are open-resource exams and will not be proctored, but they are designed to be completed individually, without any collaboration with fellow classmates or aid from others.

The quiz has to be accessed during the first 10 minutes of class time. Failure to start the quiz during that time interval will result in a zero in this component of the course. The weight of the missed quiz will be automatically added to the Final Exam.

b) **Final Exam** will be administered during the exam time slot scheduled by the Registrar Office. The exam will be designed for 2 hours but will be accessible for 3 hours from the time it is opened.

Table 2. Weekly Quizzes Schedule

Week	Quizzes
10 May - 14 May	Quiz 1: Wednesday, 12 May 2021, 12:00 - 12:50
17 May - 21 May	Quiz 2: Wednesday, 19 May 2021, 12:00 - 12:50
24 May - 28 May	Quiz 3: Wednesday, 26 May 2021, 12:00 - 12:50
31 May - 4 June	Quiz 4: Wednesday, 02 June 2021, 12:00 - 12:50
7 June - 11 June	Quiz 5: Wednesday, 09 June 2021, 12:00 - 12:50

2. **Requisites:**

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

Prerequisite(s):

Physics 30; and Mathematics 30-1 or Mathematics 2 (offered by Continuing Education); and Mathematics 31.

Antirequisite(s):

Credit for more than one of Physics 211, 221, or 227 will not be allowed.

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:

Component(s)	Weighting [%]	Comments
Weekly Quizzes [5]	25	5 quizzes worth 5% each. Administered on D2L, during the Wednesday class. See " ASSESSMENTS " for details.
Final Exam	25	Cumulative, synchronous 2h exam scheduled by the registrar (3h writing time allowed)
Laboratories [5]	20	5 laboratories; Each consisting of an individual and a group component. See " LABORATORIES " for details.
Assignments [10]	15	[5] Completed on MyLab Pearson platform, due on Tuesday of every week (10%). + [5] Written assignments, due on Tuesdays in the "Assignment #" DropBox on D2L (5%). See HOMEWORK for details
Synchronous Activities	15	Administered during synchronous lectures. See Lectures for details

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 %

The course grade expressed as a percentage is calculated from the percentage grades of the separate course components with weights indicated above. A table for the conversion of percentage grades for the course to letter grades is provided above. The percentage grade for the course must be **equal to or larger** than the stated value to obtain a certain letter grade, without rounding.

This course will have a final exam that will be scheduled by the Registrar. [The Final Examination Schedule](#) will be published by the Registrar's Office approximately one month after the start of the term. The final exam for this course will be designed to be completed within 2 hours.

The final exam will be administered using an on-line platform. Per section [G.5](#) of the online Academic Calendar, timed final exams administered using an on-line platform, such as D2L, will be available on the platform. Due to the scheduling of the final exams, the additional time will be added to **the end** of the registrar scheduled **synchronous** exam to support students. This way, your exam schedule accurately reflects the **start time** of the exam for any **synchronous** exams. E.g. If a **synchronous** exam is designed for 2 hours and the final exam is scheduled from 9-11am in your student centre, the additional time will be added to the **end** time of the **synchronous** exam. This means that if the exam has a 1 hour buffer time, a synchronous exam would start at 9 am and finish at 12pm.

- the latest you should start an asynchronous exam would be 8 am in order to be able to submit the exam at 11am and have the full 3 hours.

4. Missed Components Of Term Work:

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, one possible arrangement is that the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course. This option is at the discretion of the coordinator and may not be a viable option based on the design of this course.

If an excused absence is approved, the following accommodations will be implemented:

The weight of the missed Weekly Quizzes (5% each) will be added to the Final Exam.

Missed Thursday Laboratories need to be submitted individually by 23.59 on Sunday on that week.

Questions administered during synchronous activities (Monday, 12:00 - 13:45), will be done using online platform (TopHat) and can be accessed from any location. These questions will be graded 50% for participation and 50% for correctness. Only 80% of the questions need to be completed for 100% of the grade (the grade will be prorated by taking the score, dividing it by 0.8 and capping the result at 100%), accommodating for missing one synchronous class

5. **Scheduled Out-of-Class Activities:**

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

6. **Course Materials:**

Required Textbook(s):

Randall A. Knight, *Physics of Scientists and Engineers, 4th Edition* Pearson.

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

7. **Examination Policy:**

No aids are allowed on tests or examinations.

Students should also read the Calendar, [Section G](#), on Examinations.

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.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business 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 submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections [I.1](#) and [I.2](#) of the University Calendar

- b. **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. **SU Wellness Services:** For more information, see www.ucalgary.ca/wellnesscentre or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email ([svsa@ucalgary.ca](mailto:svs@ucalgary.ca)) or phone at [403-220-2208](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed at (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>)
- d. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

[Student Handbook on Academic Integrity](#)
Student Academic Misconduct [Policy](#) and [Procedure](#)
[Research Integrity Policy](#)

Additional information is available on the [Student Success Centre Academic Integrity page](#)

- e. **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.

- 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](tel:403-220-3911) Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: sciencerep@su.ucalgary.ca. [Student Ombudsman](#), Email: ombuds@ucalgary.ca.
- h. **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.
- i. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes,

assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.

Weekly Tentative Lecture Schedule

week	Dates	Textbook section / Topic
Week 1	05 May - 07 May	Introduction class 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. Dot and Cros Products 1.1 Motion Diagrams 1.2 Models and Modeling 1.3 Position, Time, and Displacement
Week 2	10 May - 14 May	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 2.4 Motion with Constant Acceleration 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

Week 3	17 May - 21 May	4.4 Uniform Circular Motion 4.5 Centripetal Acceleration 4.6 Non-Uniform Circular Motion 5.1 Force 5.2 A Short Catalogue 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 Diagram 6.1 Equilibrium Model 6.2 Using Newton's Second Law 6.3 Mass, Weight, and Gravity 6.4 Friction 6.5 Drag 6.6 Examples of Newton's 2nd Law
Week 4	24 May - 28 May	7.1 Interacting Objects 7.2 Analyzing Interacting Objects 7.3 Newton's Third Law 7.4 Ropes and Pulleys 7.5 Examples of Newton's 3rd Law 8.1 Dynamics in Two Dimensions 8.2 Uniform Circular Motion 8.3 Circular Objects 8.4 Reasoning About Circular Motion 8.5 Non-Uniform Circular Motion
Week 5	31 May - 04 June	12.1 Rotational Motion 12.5 Torque 12.10 The Vector Description of Rotational Motion 12.8 Static Equilibrium 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 9.5 Dissipative Forces and Thermal Energy 9.6 Power

Week 6	07 June - 11 June	10.1 Potential Energy 10.2 Gravitational Potential Energy 10.3 Elastic Potential Energy 10.4 Conservation of Energy 10.5 Energy Diagrams 10.6 Force and Potential Energy 10.7 Conservative and Non-conservative Forces 10.8 The Energy Principle Revisited
Week 7	14 June - 16 June	11.1 Momentum and Impulse 11.2 Conservation of Momentum 11.3 Collisions 11.4 Explosions

COURSE INCOMES:

Students coming into Physics 211 should be able to:

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

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.

Electronically Approved - May 06 2021 14:49

Department Approval