



COURSE OUTLINE FOR REMOTE LEARNING

1. **Course:** PHYS 211, Mechanics - Spring 2020

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. Anna Harlick | anna.harlick@ucalgary.ca | 403 220-8648 | SB 533 | MWF, 10:00 am - 11:00 am |

Remote Learning Supplemental Information:

Some aspects of this course are being offered in real-time via scheduled meeting times. For those aspects you are required to be online at the same time. Please refer to the details below for more complete information.

Remote Learning Details:

Recordings of all lectures for the given week will be released by 9:00 am on Mondays.

The class will meet on **Monday 12:00 - 13:45** for 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-real-time questions administered via online classroom response system (TOP HAT).

NOTE: There will be additional synchronous meetings on Wednesday, May 6th (first day of classes) and Wednesday, June 17th (last day of classes). See Section 13. Addendum for additional details.

NOTE: Due to University Closing for VICTORIA DAY (Monday, May 18th), the synchronous meeting regarding material from WEEK 02 will be held on Friday, May 15th, **12:00-13:45**.

Laboratories will run **asynchronously** during Tuesday sessions and **synchronously** during Thursday sessions (see: "LABORATORIES" for details)

Course Site:

D2L: PHYS 211 L01-(Spring 2020)-Mechanics

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):

Mathematics 30-1 or Pure Mathematics 30 or Mathematics 2 (offered by Continuing Education). Note: Physics 30 is recommended as preparation for Physics 211.

Antirequisite(s):

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

Note(s):

- Physics 211 and 221 differ in their prerequisites, but cover the same material and have the same examinations and tutorial quizzes. Physics 211 has an extra lecture hour per week to deal with certain topics from High School Physics and Mathematics 31. Mathematics 31 is recommended.

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:

PHYS 211/221 Course components

| Component | Weight [%] | Comments |
|-----------------------------------|------------|---|
| Laboratory Experiments [5] | 20 | Synchronous laboratory sessions on Thursdays. See LABORATORIES for details. |
| Peer Evaluations [5] | 2 | Due: Thursday, 23:59, weekly See LABORATORIES for details. |
| Reflective Questions [6] | 3 | Due: Friday, 13:59, weekly See: LECTURES for details |
| Weekly Quizzes [6] | 20 | Online (Timed D2L Quiz) Exams. Open every Wednesday between noon and 21:59 . See: ASSESSMENTS for details |
| Assignments [6] | 20 | Written assignments. Due on Tuesdays, 11:59 am in the "Assignment #" DropBox on D2L. See HOMEWORK for details |
| Asynchronous Activities | 5 | TopHat WorkSheets, open weekly, due 11:59 am on Wednesday, June 17th, 2020 See HOMEWORK for details |
| Synchronous Activities | 5 | Administered during synchronous lectures. See: LECTURES for details See: Section 13: Addendum for schedule. |
| Final Exam | 25 | Online (D2L Quiz) Exam. Opened for 24h around the FE time scheduled by Registrar Office. See ASSESSMENTS 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 has a registrar scheduled final exam.

A) LABORATORIES

There will be two types of laboratory sessions. Tuesday sessions are meant to be used for completing the individual portion of the experiment: preliminary questions, designing and completing an experiment according to the instructions in the laboratory manual. Thursday session is designed for completion of the group work - analysis of a selected video and answering questions posted in the write-up.

Laboratory Schedule

| Week | Laboratory | Individual Component Due Date | Group Component Due Date |
|------------------|--|-------------------------------|--|
| 11 May - 15 May | Lab 1: Introduction to Measurement and Video Analysis | Tuesday, 12 May 2020, 23:59 | Thursday, 14 May 2020, end of lab session |
| 18 May - 22 May | Lab 2: Projectile Motion | Tuesday, 19 May 2020, 23:59 | Thursday, 21 May 2020, end of lab session |
| 25 May - 29 May | Lab 3: Atwood Machine | Tuesday, 26 May 2020, 23:59 | Thursday, 28 May 2020, end of lab session |
| 1 June - 5 June | Lab 4: Pendulum | Tuesday, 2 June 2020, 23:59 | Thursday, 4 June 2020, end of lab session |
| 8 June - 12 June | Lab 5: Torque | Tuesday, 7 June 2020, 23:59 | Thursday, 11 June 2020, end of lab session |

Peer Evaluations are due at 23:59 on each Thursday after a laboratory is completed. They are submitted on the Peer Evaluation forms provided on D2L. Peer Evaluations are an important factor in assessing each student's final grade for the group component of the laboratory. Five peer evaluations will be submitted, for a total of 2% of the course grade.

The weight of peer evaluations related to a missed laboratory followed by individual submission will be added to the grade for the laboratory report.

B) LECTURES

All asynchronous lectures for a given week will be posted on D2L by 9:00 am on Mondays.

There will be synchronous lectures on zoom <https://ucalgary.zoom.us/j/92947099933> (Meeting ID: 929-4709-9933)).

Synchronous Classes Schedule

| Class # | Date and TIME |
|---------|---|
| #1 | Wednesday, 06 May 2020, 12:00 -13:45 - Introduction |
| #2 | Monday, 11 May 2020, 12:00 -13:45 |
| #3 | Friday, 15 May 2020*, 12:00 -13:45 |
| #4 | Monday, 25 May 2020, 12:00 -13:45 |
| #5 | Monday, 01 June 2020, 12:00 - 13:45 |
| #6 | Monday, 08 June 2020, 12:00 -13:45 |
| #7 | Monday, 15 June 2020, 12:00 -13:45 |
| #8 | Wednesday, 17 June 2020, 12:00 -13:45 - Review |

*University is closed on Monday, 18 May 2020 for Victoria Day, synchronous class shifted to Friday, May 15th.

Prompted reflective questions, related to covered and upcoming course material are due each Friday, at 13:59. These questions will be used to designing Monday's Lecture as well as other course materials (review sheets, practice problems, top hat questions for synchronous activities during the following lecture, etc.)

C) HOMEWORK

There are three types of homework in this course:

a) **Written assignments.** There will be five, equally-weighted assignments due weekly at 11:59 am on Tuesdays, starting with Tuesday, May 19th. 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) **Asynchronous Top Hat Worksheets.** There will be six, equally-weighted worksheets that will open every Wednesday. The worksheets are designed to help in understanding the material presented in the given week. The worksheets are opened until the last day of classes, but it is recommended to complete them as one watches the material for the week.

c) **Practice questions.** There will be a Pearson mylabandmastering website associated with the course that will contain additional practice questions, set up by chapter. These questions are for practice only and are not worth any marks.

D) ASSESSMENTS

a) **Weekly Quizzes.** 6 weekly quizzes will become available between noon and 21:59 every Wednesday, starting on May 13th. The quizzes will be administered on "Quizzes" on D2L. Each quiz will be designed to be completed in 45 minutes, but it will be accessible for 90 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.

b) **Final Exam** will be administered on the day scheduled by the Registrar Office. The exam will be designed for 2 hours but will be accessible for 4 hours from the time it is opened. It will be available for 24 hours prior to the scheduled end time.

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 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, then the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course.

For reported absences, the following accommodations will be implemented:

- The weight of the missed Weekly Quizzes (4% 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 pro-rated 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:**

Recommended Textbook(s):

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

Online Course Components:

MyLabandMastering (<https://www.pearsonmylabandmastering.com>)- used for additional practice materials. Sets of questions related to each chapter are set up for practice only.

Students must register in <https://www.pearsonmylabandmastering.com> portal to access the additional resources. Access to MyLabandMastering is included with the purchase of a new textbook. You may already have access if you used the portal within last year. Please check this before proceeding. If you choose to just access the Pearson assignments without purchasing access to the study material please email Pearson at ucphysics.mastering@gmail.com to get an access code and registration instructions. You will be able to access only the assignments. If you have a Pearson account, Sign In at <https://www.pearsonmylabandmastering.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.

Your login name and password will be sent to your email.

Top Hat (www.tophat.com) - used for collecting responses synchronous and asynchronous components of the formative assessment in the course.

Recordings of all lectures for the given week will be released by 9:00 am on Monday under "Lectures" on **D2L**.

7. **Examination Policy:**

Exams are open-resource exams and students can use any and all available resources that will help them to complete the exams **INDIVIDUALLY**.

Collaboration on the weekly quizzes and exams is not permitted. Any suspicious activities will be reported and investigated according to Section K, "Integrity and Conduct" of the "Academic Regulations" section of the University of Calgary Calendar.

<https://www.ucalgary.ca/pubs/calendar/current/k.html>

By taking the exam student declares that they are completing their work by themselves, with the aid of notes, textbooks, lectures, and other online resources, with no third party involved in their evaluation.

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 Center:** 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 (syasa@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 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.**
- 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](tel: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](#) Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: [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 | Chapter | Topic |
|------|------------------------------|---------|--|
| #1 | 06 May - 08 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 |
| #2 | 11 May - 15 May | 1.2 | Models and Modeling |
| | | 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 |
| #3 | 18 May - 22 May | 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 |
| | | 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 | | |
| #4 | 25 May - 29 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 | | |
| | | 12.1 | Rotational Motion |

| | | | |
|----|-------------------|-------|--|
| #5 | 01 June - 05 June | 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 |
| #6 | 08 June - 12 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 |
| #7 | 15 June - 17 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 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 04 2020 08:17

Department Approval

Electronically Approved - May 04 2020 12:16

Associate Dean's Approval for arrangements for remote learning