UNIVERSITY OF CALGARY
FACULTY OF SCIENCE

Department of Physics & Astronomy
Science B 605
403 220-5385
phasoffice@ucalgary.ca

COURSE OUTLINE

1. **Course:** PHYS 227, Classical Physics - Fall 2020

   Lecture 01:

Instructor	Email	Phone	Office	Hours
Dr. Sean Stotyn	sean.stotyn@ucalgary.ca	403 210-7594	SA 101B	Mon & Wed 9-10 AM

   Course Description:

   This is the first course in physics for astrophysics and physics majors. We will explore fundamental physical models that govern how we mathematically interpret motion. These models will be explored mathematically, experimentally, and with computer simulations. Students will work closely with other students, attacking problems that build the fundamental understanding of motion in the physical universe

   Online Delivery Details:

   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.

   - Asynchronous lectures will be pre-recorded and made available to students through D2L.
   - Synchronous labs will take place online via Zoom on the Tuesdays indicated in the lab schedule below.
   - Synchronous tutorials will take place online via Zoom on Wednesdays from 2:00–3:50 PM

   Course Site:

   D2L: PHYS 227 L01-(Fall 2020)-Classical Physics

   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):
   Physics 30; and Mathematics 30-1 or Mathematics 2 (offered by Continuing Education); and Mathematics 31; and admission to a Major or Minor in Physics or Astrophysics or a Major in Chemistry, Natural Science (Physics Concentration), or Environmental Science (Physics Concentration).

   Antirequisite(s):
   Credit for more than one of Physics 227, 321, or 221 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 %
Homework (WileyPLUS)	15
Labs	20
Top Hat (lecture portion)	5
Top Hat (tutorial portion)	5
Worksheets	5
Midterm Exams (Oct. 14 and Nov. 18)	25
Final Exam (TBD)	25

   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 %

This course has a registrar scheduled final exam.

There will be two midterm assessments in this course that will have an individual component and a group component. The **individual component** will be comprised of an online quiz administered through D2L during the regularly scheduled tutorial session. For the **group component**, students will work in their lab/tutorial groups to produce video solutions to 2 long answer problems selected from a set of problems. The long answer problems will be released the same day as the individual assessment and due the following Monday at 5:00 PM.

- Midterm 1 (individual quiz) will take place on **Wednesday Oct. 14** and will cover material from weeks 1-4.
- Midterm 1 (group component) will be due on **Monday Oct. 19**.
- Midterm 2 (individual quiz) will take place on **Wednesday Nov. 18** and will cover material from weeks 5-9.
- Midterm 2 (group component) will be due on **Monday Nov. 23**.

As your term work items (labs, assignments, and exams) accumulate, the marks for students 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 TA (lab marks) or the course instructor (all other marks) 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 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, then the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course.

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

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

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME ACTIVITY . If you have a conflict with any regularly scheduled synchronous component of this course (lab or tutorial), you must seek accommodation from the course causing the conflict.

6. **Course Materials:**

Required Textbook(s):

Chabay and Sherwood, *Matter and Interactions (4th Ed)*: Wiley.

Topics Covered:

Interactions; Vectors; Systems and surroundings; The momentum principle; Iterative prediction of motion; Fundamental interactions; Conservation of momentum; Elastic and inelastic collisions; Contact interactions; Rate of change of momentum; The energy principle; Potential energy; Internal and thermal energy; Energy quantization; Spectra; Multi-particle systems; The angular momentum principle; Torque.

Course Schedule:

Week	Week	Textbook Chapters
1	Sep 8-11	Course Intro & Chapter 1
2	Sep 14-18	Chapters 1 & 2
3	Sep 21-25	Chapters 2 & 3
4	Sep 23-Oct 2	Chapters 3 & 4
5	Oct 5-9	Chapter 4
6	Oct 13-16	Chapter 5

Week	Week	Textbook Chapters
7	Oct 19-23	Chapters 5 & 6
8	Oct 26-30	Chapters 6 & 7
9	Nov 2-6	Chapters 7 & 8
--	Nov 9-13	READING BREAK -- NO CLASSES
10	Nov 16-20	Chapter 8 & 9
11	Nov 23-27	Chapter 9 & 10
12	Nov 30-Dec 4	Chapter 10 & 11
13	Dec 7-9	Chapter 11

WileyPLUS Online Assignments:

Your text, Matter & Interactions (4th Ed.) by Chabay and Sherwood is available in the bookstore bundled with a WileyPLUS code. A new text comes bundled with a code, which will give you access to the eText, assignments, read-study-practice materials, and the assignment gradebook.

There are a few options available to you when it comes to the textbook and WileyPLUS access:

1. Buy the textbook bundle with the WileyPLUS code. Keep this code, as it will be used to access the online homework system.
2. Purchase just WileyPLUS access by itself. You will not have a physical copy of the textbook but you will get access to the eText. You can purchase this at the bookstore or directly from www.wileyplus.com.
3. If you are unable to purchase a new book or the WileyPLUS standalone, you will still be able to access the homework, but you must do so from the computers in the Taylor Family Digital Library. If you choose this option you will not have access to any of the other WileyPLUS materials (eText and read-study-practice materials), but you can upgrade to a full account at any time by purchasing the standalone. To choose this option, you will need to register as described below and choose the free option.

To register, please go to www.wileyplus.com, click the "Login" button on the top right hand corner, select "Log In to WileyPLUS", then enter your:

- **username**: your U of C email address
- **password**: your 8 digit student ID.

Once you log in, you will be able to change your password. If you took the course last year and changed your password to something different than your student ID, the change will remain intact. For any technical support issues, go to www.wileyplus.com/support and choose the live chat option.

Assignment Schedule		
Assignment Name	**Date Available to Students**	**Date Assignment is Due**
Assignment 0 (not graded)	Wed Sep 9, 2020	N/A
Assignment 1	Wed Sep 9, 2020	Wed Sep 16, 2020
Assignment 2	Wed Sep 16, 2020	Wed Sep 23, 2020
Assignment 3	Wed Sep 23, 2020	Wed Sep 30, 2020
Assignment 4	Wed Sep 30, 2020	Wed Oct 7, 2020
Assignment 5	Wed Oct 7, 2020	Wed Oct 21, 2020
Assignment 6	Wed Oct 21, 2020	Wed Oct 28, 2020
Assignment 7	Wed Oct 28, 2020	Wed Nov 4, 2020
Assignment 8	Wed Nov 4, 2020	Wed Nov 25, 2020
Assignment 9	Wed Nov 25, 2020	Wed Dec 2, 2020
Assignment 10	Wed Dec 2, 2020	Wed Dec 9, 2020

Laboratories:

The labs in this course require use of the programming language VPython; this is available for free and details on how to access and use it will be provided in the labs.

Labs take place synchronously online via Zoom on Tuesdays on the dates indicated in the table below. The lab sections are 1 hour and 50 minutes long and labs are designed to be finished within the allotted time. However,

you will have until the Friday of that week at 5:00 PM to submit your lab for grading. Each lab has a pre-lab assignment that involves creating a simple program to prepare you for the simulations you will do. Each lab that you complete will explain what it is you will have to submit, which will then be graded by the TA of your lab section.

Laboratory Schedule		
Week	Date of Lab	Laboratory
1	Sep 8, 2020	NO LAB
2	Sep 15, 2020	NO LAB
3	Sep 22, 2020	Lab 01: Introduction to Simulation in VPython
4	Sep 29, 2020	NO LAB
5	Oct 6, 2020	Lab 02: Simulating Constant Acceleration
6	Oct 13, 2020	NO LAB
7	Oct 20, 2020	Lab 03: Simulating Spring-Mass Systems
8	Oct 27, 2020	NO LAB
9	Nov 3, 2020	Lab 04: Simulating Gravitational Orbits
READING WEEK: Nov 9-13		
10	Nov 17, 2020	NO LAB
11	Nov 24, 2020	Lab 05: Simulating a Physical Pendulum
12	Dec 1, 2020	NO LAB
13	Dec 8, 2020	NO LAB

Activities:

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

- Top Hat questions - lecture portion (5%)
- Top Hat questions - tutorial portion (5%)
- Lecture worksheets (5%)

Top Hat: As a vehicle to encourage class participation and student interaction, as well as to provide rapid feedback, the Top Hat system will be used. The type and number of response questions you will encounter over the semester is at the sole discretion of your instructor. Each question is graded out of 1 mark: half for participation and half for correct answer. To account for a broad range of technical difficulties that could be encountered, at the end of the semester the total Top Hat grade will be calculated out of 80 rather than 100. To register for Top Hat:

- Go to www.tophat.com and click on "Singup" in the top right corner of the screen.
- Select "Sign-up as student" and when it prompts you to, enter the 6-digit Join Code "336313" and choose "Physics 227 Lecture F2020" from the menu and click "Join this Course."
- Input your full name and your University of Calgary email address. If you do not use your UofC email then you will be asked to pay but you **do not need to purchase access to Top Hat** because the University of Calgary has a site license.
- In order to properly get credit for Top Hat at the end of the semester, enter your 8-digit UCID in the appropriate spot in your profile.
- If you will be using your mobile device to text in answers during class, be sure to put in your phone number during signup and follow the instructions.
- Once you are done signing up, enrol in the tutorial Top Hat course with the 6-digit Join Code "517742" and choose "Physics 227 Tutorial F2020".

Lecture worksheets: Each week's worth of lecture material will have a worksheet associated with it. These worksheets will be posted to D2L and will be designed to help guide the student through the pre-recorded lectures. Completed worksheets are to be submitted to the appropriate Dropbox on D2L by 5:00 PM on the following Monday. Students are encouraged to work collaboratively on these worksheets and ask questions during the tutorials to get feedback on parts that are confusing or poorly understood. Worksheets are graded for completion instead of correctness in order to encourage their completion, not produce stress about getting the answer correct after first learning the topic.

7. **Examination Policy:**

   During the individual D2L quizzes for the midterm and final assessments, students can access their course notes, textbook, and the internet while completing this portion, but they cannot communicate with any other individual while they are writing. Similarly, for the group component of the midterm and final assessments, students must only communicate with other group members; communication between groups is not allowed.

   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.

    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) or phone at 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. 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.

Course Incomes:

It is expected that students entering PHYS 227 are able to:

- Solve for the roots of a quadratic equation
- Use trigonometry and geometry to solve problems
- Employ basic algebraic manipulations
- Perform basic derivatives and integrals

Course Outcomes:

- Explain how interactions between systems affect motion
- Catalog and discuss fundamental and emergent interactions
- Make mathematical predications about collisions using the momentum principle
- Calculate behavior of systems using the energy principle and energy quantization
- Predict behaviour of rotating systems using angular momentum, torque and rotational kinetic energy.

Electronically Approved - Aug 24 2020 10:19

Department Approval