



COURSE OUTLINE

1. **Course:** PHYS 227, Classical Physics - Fall 2019

Lecture 01: MWF 09:00 - 09:50 in ENA 103

Instructor	Email	Phone	Office	Hours
Dr. Sean Stotyn	sean.stotyn@ucalgary.ca	403 210-7594	SA 101B	TBA

Course Description:

This is the first course in physics for astrophysics and physics majors. We will have lively discussions about all aspects of mechanics. 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

Course Site:

D2L: PHYS 227 L01-(Fall 2019)-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):

A grade of 75 per cent or higher in Physics 30; 60 per cent or higher in Mathematics 31; and 75 per cent or higher in Mathematics 30-1 or a grade of "B" or 70 per cent or better in Mathematics 2 (offered by Continuing Education) and admission to Physics, Astrophysics, Chemical Physics, Chemistry, Natural Science (Physics Concentration), or Environmental Science (Physics Concentration); or Mathematics 275 and Physics 211 or 221.

Antirequisite(s):

Credit for Physics 227 and 321 will not be allowed.

Note(s):

- a. Natural Sciences students without approved concentrations who are interested in concentrating in Physics should contact the Department for approval.

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)	10
Labs	20
Activities (Top Hat, worksheets, pre-readings)	10
Midterm Exams (Oct. 9 and Nov. 6)	30
Final Exam	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 %	86 %	82%	78%	74 %	70 %	65%	60%	55 %	50 %

This course has a registrar scheduled final exam.

There will be two midterms in this course that will be held during the Wednesday **tutorial** session from 14:00-15:50 that week:

- Midterm 1 will take place on **Wednesday Oct. 9** and will cover material up to and including Friday Oct. 4
- Midterm 2 will take place on **Wednesday Nov. 6** and will cover material up to and including Friday Nov. 1

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:**

In the event that a student misses the midterm or any course work due to illness, supporting documentation, such as a medical note or a statutory declaration will be required (see [Section M.1](#); for more information regarding the use of statutory declaration/medical notes, see [FAQ](#)). Absences must be reported within 48 hrs.

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 themselves with these regulations. See also [Section E.3](#) of the University Calendar.

Missed Labs:

If you know ahead of time that you will miss a lab session due to a conflict, contact the course instructor as soon as possible to arrange for an accommodation, the details of which are at the discretion of the instructor. Please note that out-of-class midterms from other courses will not be considered as valid conflicts (see section on Out of Class Activities), but sports games, tournaments, etc. may be. It is up to the instructor to decide whether an accommodation will be granted.

If you miss a regularly scheduled lab, you must contact the course instructor **within 7 days** of the absence in order to be considered for a make-up lab. Depending on the reason for your absence, a piece of supporting documentation (statutory declaration, doctor's note, etc.) may be required. The instructor will then arrange for an accommodation, the details of which are at the discretion of the instructor. Make-up sessions for labs 1-3 will take place on Oct. 9, for labs 4-6 on Nov. 5, and for labs 7 and 8 on Dec. 3.

Missed assignments:

Please contact the course instructor 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 midterm:

Students who miss the midterm due to ill health or other valid reasons, will most often be granted an accommodation provided that the alleged problems are supported with documentation (statutory declaration, doctor's note, etc.). The student must contact the course instructor and provide the necessary documentation preferably the day of the exam, but no later than 11:59 pm the day after the exam, unless other arrangements are agreed to by the instructor. Once the claim is substantiated, the instructor will get back to the student with a suitable accommodation.

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 component of this course (lecture, lab, or tutorial), you must seek accommodation from the course causing the conflict.

6. **Course Materials:**

Required Textbook(s):

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	Textbook Chapters and Topics Covered
Sep 6	Introduction to the course
Sep 9-13	Chapter 1 - Interactions and Motion
Sep 16-20	Chapter 2 - The momentum principle
Sep 23-27	Chapter 3 - The fundamental interactions
Sep 30-Oct 4	Chapter 4 - The fundamental interactions
Oct 7-11	Chapter 5 - Rate of change of momentum
Oct 14-18	Chapter 5/6 - The energy principle
Oct 21-25	Chapter 6/7 - Internal energy
Oct 28-Nov 1	Chapter 7/8 - Energy quantization
Nov 4-8	Chapter 8/9 - Multi-particle systems
Nov 11-15	READING BREAK -- NO CLASSES
Nov 18-22	Chapter 9/10 - Collisions
Nov 25-29	Chapter 10/11 - Angular momentum
Dec 2-6	Chapter 11 - Torque

WileyPLUS Online Assignments:

Your text, *Matter & Interactions* 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	Dates of the Material Covered	Date Available to Students	Date Assignment is Due
Assignment 0	Intro to WileyPLUS	Fri Sep 6, 2019	Fri Sep 13, 2019
Assignment 1	Sep 9-13	Fri Sep 6, 2019	Wed Sep 18, 2019
Assignment 2	Sep 16-20	Wed Sep 11, 2019	Wed Sep 25, 2019
Assignment 3	Sep 23-27	Wed Sep 18, 2019	Wed Oct 2, 2019
MT1 Practice	Sep 6 - Oct 4	Wed Sep 25, 2019	N/A

Assignment Schedule			
Assignment Name	Dates of the Material Covered	Date Available to Students	Date Assignment is Due
Assignment 4	Sep 30 - Oct 11	Wed Oct 2, 2019	Wed Oct 16, 2019
Assignment 5	Oct 14-18	Wed Oct 9, 2019	Wed Oct 23, 2019
Assignment 6	Oct 21-25	Wed Oct 16, 2019	Wed Oct 30, 2019
MT2 Practice	Oct 7 - Nov 1	Wed Oct 23, 2019	N/A
Assignment 7	Oct 28 - Nov 8	Wed Nov 6, 2019	Wed Nov 20, 2019
Assignment 8	Nov 18-22	Wed Nov 13, 2019	Wed Nov 27, 2019
Assignment 9	Nov 25-29	Wed Nov 20, 2019	Wed Dec 4, 2019
FINAL Practice	Sep 7 - Dec 6	Wed Nov 27, 2019	N/A

Laboratories:

Students are required to purchase a **blue lab notebook** from the University bookstore, but the individual lab documents will be uploaded weekly to D2L, which students can then access and print off. 4 of the 8 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. It is recommended that students bring a laptop or tablet to the labs requiring VPython. Students without a laptop or tablet may use the computers in the lab room on a first come, first served basis.

Labs take place most Tuesdays in ST 037 and will begin on September 17, 2019. The lab sections are 1 hour and 50 minutes long and should be finished within the allotted time, although lab notebooks for the experimental labs are to be handed in the next day (Wednesday) by 12:00 pm to the appropriate drop box in the basement of Science Theatres, unless otherwise specified. Each lab has a pre-lab assignment that involves either creating a simple program for the VPython labs, or initializing an entry in your lab notebook and answering a few questions for the experimental labs. 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 7, 2019	NO LAB
2	Sep 11, 2019	NO LAB
3	Sep 17, 2019	Lab 01: Introduction to Simulation in VPython
4	Sep 24, 2019	Lab 02: Introduction to Laboratory Skills
5	Oct 1, 2019	Lab 03: Simulating Constant Acceleration
6	Oct 8, 2019	NO LAB (Midterm 1 + make-up labs)
7	Oct 15, 2019	Lab 04: Constant Acceleration Experiment
8	Oct 22, 2019	Lab 05: Simulating Spring-Mass Systems
9	Oct 29, 2019	Lab 06: Spring-Mass Systems Experiment
10	Nov 5, 2019	NO LAB (Midterm 2 + make-up labs)
READING WEEK: Nov 11-15, NO LABS		
11	Nov 19, 2019	Lab 07: Simulating a Physical Pendulum
12	Nov 26, 2019	Lab 08: Physical Pendulum Experiment
13	Dec 3, 2019	NO LAB (make-up labs)

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.

- In-class Top Hat questions (3%)
- Pre-lecture quizzes (4%)
- In-class worksheets (3%)

Top Hat: As a vehicle to encourage class participation and student interaction, as well as to provide rapid in-class 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 connectivity issues, phones dying during lecture, forgetting a device sometimes, etc., 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 "006105" and choose "Physics 227 F2019" 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.

Pre-lecture quizzes: Students will be expected to come to class prepared and so will be assigned weekly textbook readings, on which there will be weekly pre-lecture quizzes comprised of a handful of multiple choice questions. These quizzes will be on D2L under Assessments>Quizzes and they will be made available to students on Thursdays at 5:00 pm and they will be due on Sundays at 11:59 pm. The weekly reading assignment will be made available to the students on D2L.

In-class worksheets: Roughly once per week will be a "worksheet" class in which there will be minimal lecturing and students will be given the opportunity to work through a series of questions in order to engage directly with the material and promote mastery of the topics. Students are encouraged to work collaboratively on these worksheets and ask questions of the instructor in order to immediately get feedback on parts that are confusing or poorly understood. These worksheets are to be handed in at the beginning of the following class, after which they will be graded for completion instead of correctness. The point is to encourage their completion, not produce stress about getting the answer correct after first learning the topic.

How classroom time will be spent:

Active participation is vital to the learning process and to fostering a growth mindset around the skills needed to do physics. Lectures will therefore follow the textbook closely and will frequently involve questions to keep students engaged. Questions that are informed by Physics Education Research will be asked in class during the lectures to help students understand the material better; this will take place in the form of Top Hat questions and in the form of in-class worksheets

What to Bring:

- A calculator
- A pen/pencil, a notebook to keep notes on the material, and scrap paper
- A way of answering Top Hat questions (phone, laptop, or tablet)

If you fall behind or have trouble, please see me as soon as possible to figure out what can be done about it. The earlier in the course you approach me the more help I can be.

7. Examination Policy:

Both scientific and graphing calculators are allowed during exams, but no network-enabled devices will be permitted. Students are allowed to create one hand-written, double-sided, 8.5"x11" sized formula sheet to use in each exam; what appears on the formula sheet is at the discretion of the student but it must be readable without any additional aides, such as a magnifying glass.

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 **10 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 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
- 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:** 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](tel:403-210-9355).
- c. **Sexual Violence:** The University of Calgary is committed to fostering a safe, productive learning environment. The Sexual Violence Policy (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>) is a fundamental element in creating and sustaining a safer campus environment for all community members. We understand that sexual violence can undermine students' academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. 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](tel:403-220-2208).
- 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. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- f. **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.

- g. **Safewalk:** Campus Security will escort individuals day or night (See the [Campus Safewalk](#) website). Call [403-220-5333](tel:403-220-5333) for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

- h. **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.
- i. **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.
- j. **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.
- k. **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.
- l. **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.

Department Approval:

Electronically Approved

Date: 2019-08-28 19:32