

UNIVERSITY OF CALGARY  
DEPARTMENT OF Physics and Astronomy  
COURSE OUTLINE

**1. Course:** Physics 227, Classical Physics

Lecture Sections: L01: TuTh, 9:30-11:30, SB 142

Instructor: Dr. Jason Donev, SB 149B, 403-210-6343, [jason.donev@ucalgary.ca](mailto:jason.donev@ucalgary.ca),

Office Hours: Mon 13:00-14:30, Tues 13:00 – 14:30, Friday 11:00-12:00

Desire 2 Learn (D2L)

Departmental Office: Science B 605, 403-220-5385, [admin@phas.ucalgary.ca](mailto:admin@phas.ucalgary.ca)

**2. Prerequisites:**

A grade of 75% or higher in Physics 30; 60% or higher in Mathematics 31; and 75% or higher in Pure Mathematics 30 or a grade of "B" or above in Mathematics II (offered by Continuing Education). Credit for Physics 227 and 321 will not be allowed.

<http://phas.ucalgary.ca/courses/f13/PHYS227?destination=courses%2Ff13>

**3. Grading:** The University policy on grading and related matters is described sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Course Component	Weight	Grading Scale	
		A+	*
Assignments	10%	A	>90
Quizzes (9)	12%	A-	88-90
Laboratory experiments (6)	18%	B+	86-88
Midterm Tests October 17 <sup>th</sup> , November 14 <sup>th</sup>	30%	B	78-86
		B-	76-78
Final Examination To be scheduled by Registrar	30%	C+	74-76
		C	66-74
		C-	64-66
		D+	61-64
		D	50-61
		F	<50

**4. Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in Section 3.6. It is the student's responsibility to familiarize himself/herself with these regulations. See also Section E.6 of the University Calendar

**5. Course Materials:** *"Matter and Interactions", 3<sup>rd</sup> Edition, by Chabay and Sherwood, Wiley*

**Online Course Components:** WebAssign, either the free version provided in class, or the paid version with the electronic version of the book.

**6. Examination Policy:** Exams will be closed book, closed notes, but a calculator will be allowed. Students should also read the Calendar, Section G, on Examinations.

**7. Writing across the curriculum statement:** In this course, the quality of the student's writing in laboratory reports will a factor in the evaluation of those reports. See also [Section E.2](#) of the University Calendar.

**8. Human studies statement:** This course is being evaluated for education research, you will be given separate paperwork indicating whether students in the course are willing to part of that study. See also [Section E.5](#) of the University Calendar.

**0. OTHER IMPORTANT INFORMATION FOR STUDENTS:**

**(a) 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

**(b) Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).

**(c) Academic Accommodation Policy:** Students with documentable disabilities are referred to the following links: [Calendar entry on students with disabilities](#) and [Student Accessibility Services](#).

**(d) Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

**(e) Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIP). As one consequence, 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 also <http://www.ucalgary.ca/secretariat/privacy>.

**(f) Student Union Information:** VP Academic Phone: 220-3911 Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca).  
SU Faculty Rep. Phone: 220-3913 Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca)  
[Student Ombudsman](#)

**(i) Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

The following signature lines should be added to the course outline as appropriate

Department Approval \_\_\_\_\_ Date \_\_\_\_\_

## Syllabus

Professor's Name: Dr. Jason Donev  
Office: Science B 149B, 403-210-6343  
Email: [jason.donev@ucalgary.ca](mailto:jason.donev@ucalgary.ca)  
Office hours: Mon 13:00-14:30, Tues 13:00 – 14:30, Friday 11:00-12:00

### 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 Outcomes

By the end of the course, students should be able to articulate and communicate about fundamental principles that govern mechanics:

- a. How interactions affect motion
- b. Fundamental interactions
- c. Emergent interactions
- d. Systems thinking
- e. The momentum principle
- f. The energy principle
- g. Energy quantization
- h. Multiparticle systems
- i. Collisions

### How we'll spend classroom time

I believe in active learning and everyone participating in discussion; this class will centre around on dialogues about mechanics. I'll create sets of questions on the web; you'll answer these questions in groups by watching online videos, reading the textbook, discussion with your classmates and researching on the internet. Most of class time will be devoted to answering these questions, but you're expected to spend several hours a week outside of class answering these questions as well. At the end of every section, you'll add your concepts to your growing concept map and your group will discuss these answers with me or the TA. Students are encouraged to bring laptops and textbooks, but only one laptop per group will be needed. Computer simulations will be provided to aid discussion. Every member of a group is expected to have answers to all of the questions. If everyone seems to have sufficient understanding of the material, you get checked off, if not, your group goes back and fixes the problem and re-does the checkpoint. As long as all of the checkpoints are done by their due dates (dates will be given as we go along in class) and your answers are written up clearly, you'll get full marks on the checkpoints (10% of the grade for the class). Updates to your concept map are due the class period after an assignment is due. You will have weekly quizzes based on the questions that you do. If you miss class for any reason, including illness, you must contact me promptly (within 48 hours of the missed class) to make up the missed material. Quiz and test material will be based on material that we discuss in these checkpoints.

Bring:

- A calculator
- Paper and pen/pencil and notebook to keep notes on the material
- The textbook that we're working out of
- A laptop if you have one (one will be needed for every group)
- Your concept map of what you're learning in this course

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

**Homework & Projects** – Homework will be keeping up with the questions on the online assessment tool.

### **Assessments**

1. WebAssign Questions & concept map                      Due: A couple of times a week                      Value: 10%

You will be assigned questions on WebAssign to do both in class and at home. As long as you keep up with the material and get it right after a few tries, you'll get full marks for the checkpoints.

Assessment Criteria: Punctuality of assignments (if late they will be marked down 20%/day they are late unless discussed specifically with the instructor).

2. 9 Quizzes    Date: Roughly once a week    Value: 12%

In order to ensure that everyone understands the material, quizzes will be given roughly once a week, in class. These quizzes will take about 15 minutes to do and cover material from the assignments.

Assessment Criteria: Clear demonstration of work done, neatness and readability, and the correct answer. A correct answer with no work, or indecipherable work will not receive full credit.

3. Labs    Date: Every other week on Tuesdays    Value: 18%

Physics is an experimental science; as such you'll do a lab every other week. These lab sections are 3 hours and should be finished entirely within the allotted time. When you're finished, you're welcome to work on your WebAssign work or leave.

Assessment Criteria: Every lab will explain what you have to turn in, and will be marked by the TA of your lab section.

2. Midterm Exams    Date: Oct. 17<sup>th</sup>, Nov 14<sup>th</sup>    Value: 30%

Exams will cover material from the assignments and the book. The first exam will cover Chapters 1-4. The second exam will cover Chapters 5-8. Midterms will be in the Thursday tutorial sections.

Assessment Criteria: Clear demonstration of work done, neatness and readability, and the correct answer. A correct answer with no work, or indecipherable work will not receive full credit. If you have special requirements for exams, please let me know as soon as possible.

4. Final Exam    Date: TBD by registrar    Value: 30%

The final exam will cover Chapters 1-11 with a focus on 9-11.

Assessment Criteria: This exam will cover material from lecture, the assignments and the book. You'll be marked on material comprehension and how well you can communicate the material on the exams. For the final exam, you will also be asked to integrate the course material into a large picture of mechanics.

## Schedule for 227

The following is a rough outline of what topics we'll be covering, the reading that you'll be expected to do and about how long I expect to take on those topics:

Dates given are the Tuesday of lectures

- 9-10 Material for coming term, chapter 1 Interactions and Motion, math review
- 9-17 Finish chapter 1 start chapter 2 the Momentum principle  
Lab 1: Introduction to 3D computer modeling  
Quiz 1: Chapter 1
- 9-24 Finish chapter 2 start chapter 3 The Fundamental interactions  
Quiz 2: Chapter 2
- 10-1 Chapter 3  
Lab 2: Measuring Momentum  
Quiz 3: Chapter 3
- 10-8 Chapter 4 Fundamental Interactions  
Quiz 4: Chapter 4
- 10-15 Midterm 1, Chapter 5 Rate of change of momentum
- 10-22 Chapter 5, 6 the energy principle  
Lab 3: Throw a ball up in the air  
Quiz 5: Chapter 5
- 10-29 Chapter 7 internal energy  
Quiz 6: Chapter 6 and 7
- 11-5 Chapter 8 Energy Quantization  
Lab 4: Air resistance  
Quiz 7: Chapter 7&8
- 11-12 Reading day and Midterm 2
- 11-19 Chapter 9 Multiparticle systems  
Lab 5: Jumping up  
Quiz 8: Chapter 9
- 11-26 Chapter 10 Collisions  
Quiz 9: Chapter 10
- 12-3 Chapter 11 Angular momentum and review for final exam  
Lab 6: Angular momentum

Final exam, to be determined by the registrar and will be announced around November 1<sup>st</sup>.