

PHYS321A: Classical Mechanics I

September - December 2024

Territory Acknowledgement: We acknowledge and respect the lək̓ʷəŋən peoples on whose traditional territory the university stands, and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day.

Instructor: Dr. Heather Russell

Email: hrussell@uvic.ca

Office: Elliot 206

Course webpage: We will use brightspace

Office Hours: Fridays, 13:30 - 14:30 in Elliot 206

Teaching Assistant: tbd

Lectures: Tuesdays, Wednesdays, and Fridays at 10:30 – 11:20, in person.

First lecture: Wednesday, 4 September 2024 @ 10:30

Numerical tutorials: Fridays, 8:30 - 9:20, in person (recordings will be available).

First tutorial: **Friday, 15 September 2024 @ 8:30**

Tutorial instructor: tbd

Communication: If you send me an email, please start the subject with "PHYS 321A".

Appointments outside office hours: I will be available Tuesday afternoons for pre-booked appointments if you would like to meet outside office hours. Please book a time slot here: https://calendly.com/hrussell_p321a. These meetings can be in person or over zoom.

Prerequisites: (PHYS 110/111 or PHYS 120/130) and MATH204 and (PHYS/MATH 248 OR CSC 226 OR CSC 349A)

Pre- or Co-requisites: MATH342 or MATH346

Textbook:

Classical Mechanics, 5th Edition, Tom Kibble and Frank H Berkshire

Additional resources that might be helpful:

- Feynman lectures, volume 1 (available online for free: https://www.feynmanlectures.caltech.edu/I_toc.html)
- Notes from David Tong, *Dynamics and Relativity*: <http://www.damtp.cam.ac.uk/user/tong/relativity.html>
- *Analytical Mechanics*, Fowles and Cassiday
- More advanced: *Mechanics* by Landau and Lifshitz

We will work our way through the following topics:

- Motion in 1D
 - General concepts
 - Oscillatory motion
- Motion in 3D

- General particle motion
- Central forces (including gravitation and Kepler's Laws)
- Dynamics of Systems of Particles
- Dynamics of Oscillatory Systems

Assessment:

Assignments	15%
Numerical assignment problems	10%
Labs	15%
Midterm I	15%
Midterm II	15%
Final Exam	30%

Assignment of final grades will follow the [official grading system](#). Note that if the application of this scheme would result in grades that are judged by the instructor to be inconsistent with the University's grading descriptions, then the instructor will assign percentages consistent with them.

In addition to the above assessment criteria, the following apply:

- If you do not write the final exam you will be assigned an "N"
- If you have not submitted all lab reports you will be assigned an "N"
- If you do not pass the numerical assignments you will be assigned an "F"
- If you do not pass the lab component you will be assigned an "F"
- If you obtain less than 50% on each of the three exams (both midterms exams and final exam), you will be assigned an "F"
- A maximum course grade of 49% will be assigned to "N" and "F" grade

Assignments:

There will be approximately nine assignments spaced throughout the semester. You will have approximately one week to complete them after all material has been covered in class. Assignments will generally be due Fridays at 18:00, though if we fall behind schedule, the assignments will be delayed accordingly.

Late assignments will generally not be accepted without express permission so as to not create too much back and forth for the TA.

Only the best 7 / 9 assignments will count towards your final grade. **Please only contact me about missed assignments if circumstances mean you will miss more than 2 assignments.**

Numerical questions are marked and tabulated separately: the best 4/5 will count towards your final grade. Although this is a small portion of your grade, **you must receive an overall grade of at least 50% in the numerical assignments to pass the course.**

Working together and discussing assignments is strongly encouraged. However, all work must still be individual. Do not be tempted to copy solutions!

On your assignments, all answers must be presented with full explanations. We will discuss what this looks like in class, and I will remind you on each assignment.

Midterm Exams:

There will be two midterm exams held in class during class time

- Midterm Exam 1: Friday, 18 October 2024
- Midterm Exam 2: Friday, 15 November 2024

Note that the last day for withdrawing from first term courses without penalty of failure is Thursday, 31 October 2024.

Final Exam:

There will be a cumulative final exam during the December exam period. The date is centrally scheduled, and normally finalized in late October. You must write the final exam to obtain credit for this course, and you must exhibit adequate performance in the final exam to get credit for this course.

Note on Exams For the Midterm and Final exams:

You will be allowed to bring one, double-sided 8.5"x11" page of handwritten notes and a calculator. The only acceptable calculator is the Sharp EL-510R, as per department policy.

If conditions change and we are required to move online with the lectures and exams:

For exams, you would be required to log into a Zoom session; you would be required to share a webcam image, and you may be required to share your microphone or your computer screen; you would be expected to use a device which is capable of doing this; you would be expected to have a connection with enough bandwidth to support this requirement.

Labs:

Labs start the week of 9 September. This first week of labs will contain introductory sessions, and it is imperative that you attend. If you cannot attend, please contact your lab instructor. All lab sections are normally held in Elliott 125. **To obtain credit for the course, you must complete all labs and receive an overall passing grade in the lab component.** You will be given scheduling information at the first lab.

The due date for any experiment report is normally in the lab period one week after the experiment has been completed. No reports will be accepted after 4 December 2024.

Section B01, Mon 14:30 - 17:20, Elliott 125

Section B02, Tue 16:30 - 19:20, Elliott 125

Section B03, Wed 14:30 - 17:20, Elliott 125

Section B04, Thu 14:30 - 17:20, Elliott 125

Section B05, Fri 14:30 - 17:20, Elliott 125

Course Policies and Information for Students

1. Student Code of Conduct: You are expected to behave in a manner compatible with the student code of conduct: <https://www.uvic.ca/services/advising/assets/docs/tri-fac-student-code-of-conduct.pdf>
2. Inclusive Learning Environment: The best learning environment is one in which all members feel respected while being productively challenged. At UVic, we are dedicated to fostering an inclusive atmosphere, in which all participants can

contribute, explore, and challenge their own ideas as well as those of others. Every participant has an active responsibility to foster a climate of intellectual stimulation, openness, and respect for diverse perspectives, questions, personal backgrounds, abilities, and experiences, and instructors bear the primary responsibility for its maintenance. A range of resources is available if you perceive an issue related to our learning environment. If possible, I encourage you to come to me with any suggestions or concerns you have regarding a particular situation or instructional space. Alternatively, you may take concerns to another trusted advisor or administrator (such as an academic advisor, mentor, department chair, or dean).

3. Academic Integrity: Ethical behaviour is an essential component of learning and scholarship. You are expected to understand, and adhere to UVic's [academic integrity policy](#). If you have any doubts about what constitutes a violation of the Academic Integrity policy, or any other issue related to academic integrity, please ask your instructor. Some examples of appropriate ethical scholarship include:
 - a. Always citing your sources when you present ideas and/or language that you have not developed yourself, including material from class lectures and discussions.
 - b. Not using online or unapproved resources for assignment answers
 - c. Being civil, respectful, and supportive of an inclusive learning environment for all students.
 - d. Bringing issues of ethical or inclusivity concerns, for yourself or another student, to me, the department chair, or a trusted advisor.
4. Masks: Please follow university policy on mask wearing, and maintain physical distance where possible.
5. Accessible Learning: The University of Victoria is committed to creating a learning experience that is as accessible as possible. If you anticipate or experience any barriers to learning in this course, please feel welcome to discuss your concerns with me. If you have a disability or chronic health condition, or think you may have a disability, you may also want to meet with an advisor at the [Centre for Accessible Learning \(CAL\)](#).
6. Mental Health: A note to remind you to take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone. The following resources are available to you:
 - a. The UVic Student Wellness Centre provides cost-free and confidential mental health services to help you manage personal challenges that impact your emotional or academic well-being: <https://www.uvic.ca/student-wellness/>
 - b. Counselling Services can help you make the most of your university experience. They offer free professional, confidential, inclusive support to currently registered UVic students: <https://www.uvic.ca/student-wellness/wellness-resources/mental-health/index.php>

- c. University Health Services provides a full service primary health clinic for students, and coordinates healthy student and campus initiatives:
<https://www.uvic.ca/student-wellness/wellness-resources/physical-health/index.php>