UNIVERSITY OF CALGARY
FACULTY OF SCIENCE

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

COURSE OUTLINE

1. **Course:** PHYS 597, Senior Physics Laboratory - Fall 2021

   Lecture 01: W 12:00 - 12:50 - Online

Instructor	Email	Phone	Office	Hours
Dr Michael Wieser	mwieser@ucalgary.ca	403 220-3641	SB 131	TBA

In Person Delivery Details:

Laboratory sessions will be in-person.

Re-Entry Protocol for Labs and Classrooms:

To limit the spread of COVID-19 on campus, the University of Calgary has implemented safety measures to ensure the campus is a safe and welcoming space for students, faculty and staff. The most current safety information for campus can be found here. **Online Delivery Details:**

This course is being offered online in real-time via scheduled meeting times, you are required to be online at the same time.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

Lecture will be delivered via zoom:

Meeting ID: 932 8199 1013
Passcode: 43

Course Site:

D2L: PHYS 597 L01-(Fall 2021)-Senior Physics Laboratory

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 497.

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 %
Lab Introduction (x2)	10 %
Lab Notes (x2)	10 %
Lab Draft Report (x2)	10 %
Lab Final Report (x2)	30 %
At Home Introduction	5 %
At Home Report	10 %
Oral Presentation	10 %
Reflections (x5)	15 %

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 University of Calgary offers a flexible grade option, Credit Granted (CG) to support student's breadth of learning and student wellness. Faculty units may have additional requirements or restrictions for the use of the CG grade at the faculty, degree or program level. To see the full list of Faculty of Science courses where CG is not eligible, please visit the following website: https://science.ucalgary.ca/current-students/undergraduate/program-advising/flexible-grading-option-cg-grade

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, one possible arrangement is that the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course. This option is at the discretion of the coordinator and may not be a viable option based on the design of this course.

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

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

6. **Course Materials:**

   In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

   - A computer with a supported operating system, as well as the latest security, and malware updates;
   - A current and updated web browser;
   - Webcam/Camera (built-in or external);
   - Microphone and speaker (built-in or external), or headset with microphone;
   - Current antivirus and/or firewall software enabled;
   - Stable internet connection.

   For more information please refer to the UofC ELearning online website.

7. **Examination Policy:**

   There are no examinations in this course.

   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 Services:** 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/legal-services/sites/default/files/teams/1/Policies-Sexual-and-Gender-Based-Violence-Policy.pdf)

d. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional Code of Conduct and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

Student Handbook on Academic Integrity
Student Academic Misconduct Policy and Procedure
Research Integrity Policy

Additional information is available on the Student Success Centre Academic Integrity page

e. **Academic Accommodation Policy:**

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The student accommodation policy can be found at: https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf.

Students needing an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, by filling out the Request for Academic Accommodation Form and sending it to Dr. David Feder by email phas.ahugrd@ucalgary.ca preferably 10 business days before the due date of an assessment or scheduled absence.

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.

Students taking PHYS 597 are expected to have prior knowledge in:

• General physics and mathematics within the scope of standard college physics course.
• Basic methods and tools of experimental physics
• Data processing and presentation (basic statistical methods, error analysis, scientific graphics software.
• Scientific writing
• Making public presentations with slides

Lecture Schedule:

Week	Topic	Date	Speaker	Reflection Due
1	Introduction to the course	Sept 08	Mike Wieser	
2	**How to write a scientific paper**	Sept 15	Mike Wieser	
3	**How to Apply to Graduate School**	Sept 22	Jo-Anne Brown – PHAS	Sept 24
4	**Alumni – What to do with Physics Degree?**	Sept 29	PHAS Alumni	Oct 1
5	**Job Searching**	Oct 06	UofC Career Services	Oct 8
6	**Measurement and Uncertainty**	Oct 13		
7	**Ethics in Science**	Oct 20	Keith Sharkey – UofC Medicine	Oct 22
8	**EDI in Science**	Oct 27	TBA	Oct 29
9	**First Nations Perspectives in Science**	Nov 3	TBA	Nov 5
10	No Lecture – Reading Break	Nov 10		
11	Oral Presentations x4	Nov 17		
12	Oral Presentations x4	Nov 24		
13	Oral Presentations x4	Dec 01		
14	Oral Presentations x4	Dec 08		

Calendar of Activities and Due Dates

Task	Date
Lecture Start	September 8
Lab Selections due	September 15
Lab Assignments handed out	September 17
Experiment #1 Start	September 20
Experiment #1 Introduction Due	September 24
No Lab	*September 30*
At Home Experiment Proposal Due	October 8
No Lab	*October 11*

Experiment #1 Draft Due	October 15
Experiment #1 Final Report Due	October 22
Experiment #2 Start	October 25
Experiment #2 Introduction Due	October 29
No Lab	*November 8 to November 12*
Oral Presentations	November 17 – December 8
Experiment #2 Draft Due	November 19
Experiment #2 Final Report Due	November 26
At Home Experiment Report Due	December 3

Lectures:

There is one lecture per week on Wednesdays from 12:00 to 12:50. The lectures will be held in a virtual classroom environment (*i.e.* Zoom). In many of the lectures, we will explore topics that are (hopefully) helpful for career development and also to create a forum for discussion of important topics for scientists. Experts on the subject matter will be invited to lead the discussions. You will submit a post-workshop reflection by 24:00 the following Friday. The reflection should be one to two pages in length and address questions that will be distributed prior to each workshop. There are no "right or wrong" answers and the self-reflection is meant to be a personal response to the topics we encounter. The reflections will be treated with respect and will not be shared with other members of the class.

On Campus Experiments:

This semester, you can select two experiments to work on. The list of experiments is provided below. It is recommended to work with a laboratory partner and you and your partner should submit a list of at least three experiments that are of interest to me by September 15. I will provide you with your two selections by September 17. Documents, including operating manuals and background information for the experiments, will be available on-line via the course D2L website, which should be "live" by the first week of September.

The first deliverable is an introduction section that should describe the **goals** and **motivation** for the experiment along with some concise background information and references. The Introduction document should be two pages in length (single spaced) and include at least 3 carefully chosen peer-reviewed references. A draft report for the experiment is due next. This should be an almost complete report so I can provide feedback for your final report. Essentially, the report should include the clearly articulated goal and motivation for the paper, background literature review, description of the experiment, results, discussion, conclusion and references. The report should be 10 pages in length (single spaced) including text, figures and references.

At Home Experiment:

In addition to the experiments conducted on campus, you will have the opportunity to work on an experiment that can be performed at home. You will use an Arduino (or other micro-controller) to sample data of any kind and then to perform some data reduction and analysis. This experiment is intentionally very open-ended and will allow you to explore practically any topic. The goal is to acquire data with an electronic device, digitize these data in some way and then analyze and interpret the results. We can loan you the hardware you need to complete the experiment. A short proposal (including goal, motivation, and timeline) is due on October 8 and the final report (including description of the experiment, data, and analysis) is due on December 3.

Oral Presentations:

Oral presentations are scheduled during class time from November 17 to December 8. These will be done virtually. Each of you will do your own presentation. The topic of the oral presentation can be developed around the at home experiment or one of the experiments performed on campus. The presentation should be eight minutes in length.

Lab Notebooks:

An on-line laboratory notebook should be maintained by you to summarize the progress/data/insights for the measurement and on-campus experiments. At least two entries per week (or more depending on the work done) should be submitted. The notebook will record progress, notes on background material, observations and data from the experiment itself, and any data analysis that is performed for the experiment. Feedback will be provided on a weekly basis to help ensure that you are on track. The communication around the notebook will serve as a virtual check-in between you, the TAs, and myself throughout the semester.

Course Outcomes:

- Improve physics knowledge
- Learn the work of experimental physicists
- Improve technical skills
- Improve computer data processing skills and maintaining lab records
- "Metascience"
- Reading a research article

- Writing articles
- Reporting your findings at a conference, becoming an independent scientist
- Independent thinking
- Literature review
- Problem solving and problem finding

Electronically Approved - Sep 06 2021 08:57

Department Approval

Electronically Approved - Sep 07 2021 09:37

Associate Dean's Approval