



COURSE OUTLINE

1. **Course:** PHYS 597, Senior Physics Laboratory - Fall 2020

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

Instructor	Email	Phone	Office	Hours
Dr Michael Wieser	mwieser@ucalgary.ca	403 220-3641	SB 131	Please contact me via email to schedule virtual office hours.

In Person Delivery Details:

Laboratory sessions as scheduled by the Registrar will be conducted in person on campus. Rooms to be announced, depending on the experiment selected by the student.

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.

Lectures will be delivered via Zoom.

Course Site:

D2L: PHYS 597 L01-(Fall 2020)-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 %	Date
Workshop Reflections	25 %	
Expt - Technical Report	15 %	Oct 23
Expt - Formal Report - First Draft	5 %	Nov 6
Expt - Final Draft	10 %	Nov 20
Expt - Peer Review	5 %	Nov 30
Expt - Response to Reviewers	5 %	Dec 7
Measurement Lab - Proposal	5 %	Oct 7
Measurement Lab - Technical Report	10 %	Nov 27
Oral Presentation	10 %	Nov 18 - Dec 9
Lab Notebook	10 %	

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 %

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.

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.

- 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

- 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](tel: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](tel: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 (FOIP). 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](tel:403-220-3911) Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: [403-220-3913](tel: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.

PHYS 597 - Further Details

Lecture Schedule:

Week	Topic	Date	Speaker	Reflection Due
1	Introduction to the course	Sept 09		
2	How to write a scientific paper	Sept 16	Stuart Cantrill - Nature Chem	Sept 21
3	How to Apply to Graduate School	Sept 23	Jo-Anne Brown - PHAS	Sept 28
4	Alumni - What to do with Physics Degree?	Sept 30		Oct 5
5	Job Searching	Oct 07	UofC Career Services	Oct 13
6	Measurement and Uncertainty	Oct 14	Juris Meija - NRC	Oct 19
7	Ethics in Science	Oct 21	Keith Sharkey - UofC Medicine	Oct 26
8	EDI in Science	Oct 28	Steve Vamosi - Fac. Science	Nov 2
9	First Nations Perspectives in Science	Nov 4	Jennifer Howse - RAO	Nov 9
10	Remembrance Day	Nov 11	No Lecture	
11	Oral Presentations x4	Nov 18		
12	Oral Presentations x4	Nov 25		
13	Oral Presentations x4	Dec 02		
14	Oral Presentations x4	Dec 09		

Calendar of Activities and Due Dates

Task	Date
Expt - Select term experiment	September 16
Expt - Receive assigned experiment - First week of laboratories	September 21
Expt - Introduction due	September 28
Measurement - Proposal due	October 7
Expt - Technical Report due	October 23
Expt - First Draft due	November 6
Expt - Final Draft due	November 20
Measurement - Technical Report due	November 27
Expt - Peer review due	November 30
Expt- Response letter to "editor" due	December 7
Measurement or Expt - Oral Presentations	November 18 - December 09

Workshops:

There is one lecture hour per work in PHYS 597 on Wednesdays from 12:00 to 12:50. This lecture hour will serve a critical component of the course by introducing topics that are important to assist with the career development of students as well as create a forum for discussion of important topics in Science. The lectures will be conducted in a virtual classroom environment. Experts on the subject matter will be invited to lead the discussions. The topics are indicated in **Bold type** in the Lecture Schedule. Readings, if available, will be posted prior to the topics on D2L before the workshop. Students will **submit a post-workshop reflection by 12:00 the following Monday**. The reflection should be one to two pages in length and describe the student's reaction to the discussion from a personal perspective. The self-reflection could address the following:

1. What did you learn about your own understanding or perceptions of the topic after participating in the workshop?
2. How has your understanding of the topics developed after the workshop? If there are no changes, that is fine! Reflect on why there are no changes.
3. What are your thoughts on the learning experience in general? Was this useful? Why or why not?

There are no “right or wrong” answers and the self-reflection is meant to be a personal response to the topics we encounter. The essays that are submitted will be treated with respect and will not be distributed to other members of the class. There are eight workshop reflections in total for a course grade of 25 %.

On Campus Experiment:

This semester, students will select **one** of the experiments available to work on over an approximately five-week period during the semester. There is only one set of equipment available for most of the experiments and students will work independently. A list of available experiments will be circulated to students by the first lecture. Documents including operating manuals and background information for the experiments will be available on-line via the course D2L website at the start of the semester. Students will have to submit their top three choices of experiments by September 16. Students will receive their assignment on September 21 and can begin the work on the experiment immediately. The first deliverable is an introduction section that will describe the goals and motivation for the project 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. This is due on September 28. Then, a **technical report** that summarizes the execution and results of the experiment is due on October 23 and should be about three to four pages in length (single spaced). The technical report should include a concise description of what was done and a summary of results, data plots or graphs, and relevant calculations. A brief discussion of uncertainties should be provided.

Students will write a journal format paper based on their experiment, which will include clearly articulated goals and motivations for the paper, background literature review, description of the experiment, results, discussion, conclusion and references. The paper should be roughly six single-spaced pages in length including text, data tables, figures and references. The **first draft** of the report is due on November 6. I will read the first draft and provide feedback for students by November 16 that could be incorporated in a final draft. This **final draft** is due on November 20 and will be submitted to the TAs and other students in the class for peer review. Each student will receive one report from a colleague in the course and must provide constructive criticism of the report and the presentation of the results. The **peer review** will follow the standards expected from the peer review of articles submitted to a major scientific journal. The reviews are due on November 30. The feedback that students give will be graded. The original author of the paper will take this feedback and prepare a **response to the “editor”** of the journal in the form of a one-page letter arguing what changes were incorporated based on the feedback. This response letter is due on December 7.

Note that any students that cannot be present on campus for any reason should discuss alternatives with me as soon as possible. Other opportunities to get experience in the communication and data analysis goals of this exercise exist, including virtual experiments or literature reviews that can be completed remotely. In the event that an agreed upon alternative off campus exercise is performed, the course components and deadlines will remain as described in the course outline.

Measurement Experiment:

In addition to the experiment that will be conducted on campus, students will have the opportunity to work on an experiment that can be performed at home. The goal is to 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 students to explore practically any topic. The goal is that data are acquired by an electronic device, digitized in some way and the results are analyzed and interpreted. A short **proposal** of at one to two single-spaced pages (including goal, motivation, and timeline) is due on October 7 and the **final technical report** (including description of the experiment, data, and analysis) is due on November 27. The technical report should be five single-spaced pages in length including data tables, figures and diagrams, and references.

Oral Presentations:

Oral presentations are scheduled during class time from November 18 to December 09. These will be done virtually. The topic of the oral presentation can be developed around the measurement experiment or the experiment performed on campus. The presentation should be five minutes in length. We will arrange the date and time for each presentation in November.

Lab Notebooks:

An on-line laboratory notebook should be maintained by each student summarizing 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 students are on track. The communication around the notebook will serve as a virtual check-in between the students, 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 - Aug 21 2020 15:54

Department Approval

Electronically Approved - Aug 26 2020 15:31

Associate Dean's Approval