THE UNIVERSITY OF BRITISH COLUMBIA
Department of Computer Science, Mathematics, Physics and Statistics
Okanagan Campus

Physics 232 – Modern Physics Laboratory

General Info

Selected experiments in relativity, quantum mechanics, thermodynamics, particle physics or nuclear physics. Quantitative analysis of data, methods of measurement, formal presentation of laboratory results. Credit will be granted for only one of PHYS 232 or PHYS 229. [2-3-0]

Course: Physics 232 101(3 credits)
Date and Term: W2022 T-2
Instructor: Jake Bobowski (laboratory)
Email: jake.bobowski@ubc.ca
Instructor: Yas Yamin (lecture)
Email: yas.yamin@ubc.ca
TA's names: Skyler Alderson (L03)
Steve Collins (L01)
Lecture: MW 12:00-13:00 (FIP 239)
Laboratory: L01 Tue. 09:30-12:30
L03 Mon. 13:30-16:30
You **must** register in one of the lab sections
Office Hours: Formal office hours will be published online. Otherwise, contact your instructor via email.
Course website: Canvas
URL: https://people.ok.ubc.ca/jbobowsk/phys232.html
Pre-reqs: MATH 101 and one of PHYS 102, PHYS 121, PHYS 122
PHYS 231 recommended
Textbooks:
The textbooks for the course are:
Dealing with Uncertainties: A Guide to Error Analysis by Manfred Drosg
Statistics and Analysis of Scientific Data by Massimiliano Bonamente
You do not need to purchase these books. They are available to you for free through the online UBC Library.
You may also find the following texts to be useful resources (not required):
Data Reduction and Error Analysis for the Physical Sciences by Bevington & Robinson
An Introduction to Error Analysis: The Study of Uncertainties in Physical Measurements by John R. Taylor.

Overview

In this course you will perform a set of online experiments designed to compliment your theoretical physics education. Each experiment will be different such that a range of topics and phenomena are covered (modern physics, waves, radiation, thermodynamics, . . .). You will have two lab periods to complete each experiment.

The lecture portion of the course will be used to discuss the treatment of uncertainties and data analysis methods. Course content will be posted online. Midterm break and other calendar dates can be found at http://okanagan.students.ubc.ca/calendar/

In the Lecture & Lab

I will do my best to present material and respond to questions in a clear and logical way. However, you must take responsibility for your own learning. Come to the lab prepared. Read and study the manual before coming to the lab, ask questions, ask for clarification, contribute to discussions, offer ideas, . . . There will be assignments throughout the term. The assignments will allow you to apply what you've learned in the lectures and from the textbook.

Evaluation Criteria and Grading

Note that, the grading scheme below may evolve.

Pre-Lab Exercises:	5%
Lab Notebook:	30%
Formal Report:	25%
Assignments:	12.5%
Final Exam:	27.5%

IMPORTANT

Final grades will be based on the evaluations listed above and the final grade will be assigned according to the standardized grading system outlined in the UBC Okanagan Calendar.

Late Policy

Late assignments and lab work will not be accepted. No exceptions.

Passing Criteria

You must receive at least 50% on the final exam to pass PHYS 232.

Tentative Course Schedule and Required Readings

See the updated schedule on the course website.

Grading Practices

Faculties, departments, and schools reserve the right to scale grades in order to maintain equity among sections and conformity to University, faculty, department, or school norms. Students should therefore note that an unofficial grade given by an instructor might be changed by the faculty, department, or school. Grades are not official until they appear on a student's academic record.

http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,41,90,1014

Final Examinations

The examination period for this term will be from **Monday April 17, 2023 to Friday April 28, 2022**. Students will be permitted to apply for out-of-time final examinations only if they are representing the University, the province, or the country in a competition or performance; serving in the Canadian military; observing a religious rite; working to support themselves or their family; or caring for a family member. Unforeseen events include (but may not be limited to) the following: ill health or other personal challenges that arise during a term and changes in the requirements of an ongoing job. An examination hardship is defined as the occurrence of an examination candidate being faced with three (3) or more formal examinations scheduled within a 27-hour (inclusive) period.

Further information on **Academic Concession** can be found under **Policies and Regulation in the *Okanagan Academic Calendar*** http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,48,0,0

Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

A more detailed description of academic integrity, including the University's policies and procedures, may be found in the Academic Calendar at: http://okanagan.students.ubc.ca/calendar/index.cfm?tree=3,54,111,0.

Cooperation vs. Cheating

Working with others on assignments is a good way to learn the material and we encourage it. However, there are limits to the degree of cooperation that we will permit. Any level of cooperation beyond what is permitted is considered cheating.

When working on programming assignments, you must work only with others whose understanding of the material is approximately equal to yours. In this situation, working together to find a good approach for solving a programming problem is cooperation; listening while someone dictates a solution is cheating. You must limit collaboration to a high-level discussion of solution strategies, and stop short of actually writing down a group answer. Anything that you hand in, whether it is a written problem or a computer program, must be written by you, from scratch, in your own words. If you base your solution on any other written solution, you are cheating. If you provide your solution for others to use, you are also cheating.

Copyright Disclaimer

Diagrams and figures included in lecture presentations adhere to Copyright Guidelines for UBC Faculty, Staff and Students http://copyright.ubc.ca/requirements/copyright-guidelines/ and UBC Fair Dealing Requirements for Faculty and Staff http://copyright.ubc.ca/requirements/fair-dealing/. Some of these figures and images are subject to copyright and will not be posted to ***Canvas.*** All material uploaded to ***Canvas*** that contain diagrams and figures are used with permission of the publisher; are in the public domain; are licensed by Creative Commons; meet the permitted terms of use of UBC's library license agreements for electronic items; and/or adhere to the UBC Fair Dealing Requirements for Faculty and Staff. Access to the ***Canvas*** course site is limited to students currently registered in this course. Under no circumstance are students permitted to provide any other person with means to access this material. Anyone violating these restrictions may be subject to legal action. Permission to electronically record any course materials must be granted by the instructor. Distribution of this material to a third party is forbidden.

Grievances and Complaints Procedures

A student who has a complaint related to this course should follow the procedures summarized below:

- The student should attempt to resolve the matter with the instructor first. Students may talk first to someone other than the instructor if they do not feel, for whatever reason, that they can directly approach the instructor. If the complaint is not resolved to the student's satisfaction, the student should e-mailthe Associate Head of Physics Department Dr. Jake Bobowski (jake.bobowski@ubc.ca) or the Department Head Dr. John Braun at john.braun@ubc.ca .

Student Service Resources

Disability Assistance

The Disability Resource Centre ensures educational equity for students with disabilities, injuries or illness. If you are disabled, have an injury or illness and require academic accommodations to meet the course objectives, e-mail us or visit our website for more information.

Web: http://students.ok.ubc.ca/drc/welcome.html **E-mail** DRC at: drc.questions@ubc.ca

Equity, Human Rights, Discrimination and Harassment

UBC Okanagan is a place where every student, staff and faculty member should be able to study and work in an environment that is free from human rights-based discrimination and harassment. If you require assistance related to an issue of equity, discrimination or harassment, please contact the Equity Office, your administrative head of unit, and/or your unit's equity representative. **UBC Okanagan Equity Advisor: ph. 250-807-9291**

Web: https://equity.ok.ubc.ca/ **E-mail:** equity.ubco@ubc.ca

Health & Wellness - UNC 337

At UBC Okanagan health services to students are provided by Health and Wellness. Nurses, physicians and counsellors provide health care and counselling related to physical health, emotional/mental health and sexual/reproductive health concerns. As well, health promotion, education and research activities are provided to the campus community. If you require assistance with your health, please contact Health and Wellness for more information or to book an appointment.

Web: www.students.ok.ubc.ca/health-wellness **Email:** healthwellness.okanagan@ubc.ca

Sexual Violence Prevention and Response Office (SVPRO)

A safe and confidential place for UBC students, staff and faculty who have experienced sexual violence regardless of when or where it took place. Just want to talk? We are here to listen and help you explore your options. We can help you find a safe place to stay, explain your reporting options (UBC or police), accompany you to the hospital, or support you with academic accommodations. You have the right to choose what happens next. We support your decision, whatever you decide. Visit svpro.ok.ubc.ca or call us at 250-807-9640

Independent Investigations Office (IIO)

If you or someone you know has experienced sexual assault or some other form of sexual misconduct by a UBC community member and you want the Independent Investigations Office (IIO) at UBC to investigate, please contact the **IIO**. Investigations are conducted in a trauma informed, confidential and respectful manner in accordance with the principles of procedural fairness. You can report your experience directly to the **IIO by** calling 604-827-2060.

Web: https://investigationsoffice.ubc.ca/ **E-mail:** director.of.investigations@ubc.ca

The Hub

The Student Learning Hub (LIB 237) is your go-to resource for free math, science, writing, and language learning support. The Hub welcomes undergraduate students from all disciplines and year levels to access a range of supports that include **tutoring in math, sciences, languages, and writing, as well as help with study skills and learning strategies** . **Web:** (https://students.ok.ubc.ca/student-learning-hub/) **Ph:** 250-807-9185.

SAFEWALK - Download the UBC SAFE – Okanagan app.
Don't want to walk alone at night? Not too sure how to get somewhere on campus?
Call Safewalk at 250-807-8076 For more information: https://security.ok.ubc.ca/safewalk/