

Phys 6602, Winter 2025

Advanced topics in particle physics phenomenology

Course instructors:

Dag Gillberg dag@physics.carleton.ca (Course coordinator)

Simon Viel, SimonViel@cunet.carleton.ca

Daniel Stolarski, stolar@physcs.carleton.ca

Razvan Gornea, rgornea@phycisc.carleton.ca

Student hours: By appointment

Class time: Mondays and Wednesdays 14:35-15:55

Website: carleton.brightspace.com

Welcome to Phys 6602

This course consists of four series of lectures, each of three weeks duration, by four different instructors.

Course description

This course will consist of a variety of seminars and short lecture courses, and will cover topics of immediate interest to the research program of the department.

Includes: Experiential Learning Activity

Prerequisite(s): PHYS 6601 or permission of the Department.

Inclusive teaching statement: *Science is for everyone. We are committed to fostering an environment for learning that is inclusive for everyone. All students in the class, the instructor, and any guests should be treated with respect during all interactions. I would appreciate any feedback related to the class or its delivery throughout the course.*

Land acknowledgement: *We, the people of the Faculty of Science at Carleton University, acknowledge that our campus is located on the traditional, unceded territories of the Algonquin Anishinabeg people. Miigwetch for your hospitality and stewardship of this territory and the teachings that come from it. We are grateful for this land, the air that we breathe, and the water that sustains us all as well as for the animals, plants and other living beings: these enable us to research, teach, mentor, support, study, and learn. We recognize our responsibility to our natural environment and to reconciliation with Indigenous peoples.*

Topics Covered and Learning Outcomes

Weeks	Instructor	Topic
1-3 Jan 6 – Jan 22	Dag Gillberg	LHC Physics
4-6 Jan 27 – Feb 12	Simon Viel	Dark Matter
7-10 Feb 24 – Mar 12	Daniel Stolarski	Higgs and the Hierarchy Problem
11-13 Mar 17 – Apr 2	Razvan Gornea	Neutrino Physics

Important dates and deadlines can be found here:

<https://carleton.ca/registrar/registration/dates/academic-dates/>, including class suspension for fall, winter breaks, and statutory holidays.

Course assessment

COMPONENT		GRADE VALUE
ASSIGNMENTS		4 x 20%
SEMINAR		20%

Assignments

A homework assignment will be distributed toward the end of each of the four lecture series. It should be completed and handed in within two weeks of the end of the corresponding lecture series. Each instructor will provide instructions for how you should submit their assignment.

Final seminar

There are no exams in this course. Instead, each student will prepare and deliver a **20-minute final seminar**, using slides, on a particle physics topic of your choice (subject to approval by the course coordinator). Please finalize your choice of topic, in discussion with me, before the week of Winter Break. Your talk must be new and cannot be a resubmission or modification of a talk previously prepared for another course, conference, group meeting, etc. You should take this opportunity to learn about a particle physics topic that is not directly related to your thesis research. The talks will be delivered during an in-person mini-symposium to be arranged during the April exam period in consultation with the class. Physics Department faculty will be invited to attend and contribute to the evaluation of the talks.

Academic accommodations and regulations

Carleton is committed to providing academic accessibility for all individuals. You may need special arrangements to meet your academic obligations during the term. The accommodation request processes are outlined on the Academic Accommodations website

(<https://students.carleton.ca/course-outline/>).

Statement on generative AI usage, such as ChatGPT

As our understanding of the uses of AI and its relationship to student work and academic integrity continue to evolve, students are required to discuss their use of AI in any circumstance with the course instructor to ensure it supports the learning goals for the course.

Statement on Academic Integrity

Students are expected to uphold the values of academic integrity, which include fairness, honesty, trust, and responsibility. Examples of actions that compromise these values include but are not limited to plagiarism, accessing unauthorized sites for assignments or tests, unauthorized collaboration on assignments or exams, and using artificial intelligence tools such as ChatGPT for assessment questions (assignment or quiz questions).

Misconduct in scholarly activity will not be tolerated and will result in consequences as outlined in [Carleton University's Academic Integrity Policy](#). A list of standard sanctions in the Faculty of Science can be found [here](#).

Additional details about this process can be found on [the Faculty of Science Academic Integrity website](#).

Students are expected to familiarize themselves with and abide by [Carleton University's Academic Integrity Policy](#).

Student rights & responsibilities

Students are expected to act responsibly and engage respectfully with other students and members of the Carleton and the broader community. See the [7 Rights and Responsibilities Policy](#) for details regarding the expectations of non-academic behaviour of students. Those who participate with another student in the commission of an infraction of this Policy will also be held liable for their actions.

Student concerns

If a concern arises regarding this course, your first point of contact is me: Email or drop in during student hours and I will do my best to address your concern. If I am unable to address your concern, the next points of contact are (in this order):

Note: You can also bring your concerns to [Ombuds services](#).

