THE UNIVERSITY OF WINNIPEG

FACULTY OF SCIENCE

PHYSICS

Physics is the quest to understand all natural phenomena using scientific methods.

UWinnipeg has an internationally recognized Physics Department, which offers an excellent learning atmosphere, fostered by small class sizes and individual attention from professors. The curriculum combines foundational theoretical and experimental physics courses with new cutting-edge topical courses, such as physical computing, quantum computing, and medical imaging. Physicists are amongst the most sought-after STEM practitioners, for their ability to understand the fundamental concepts underlying highly applied tasks across academic disciplines and industries, and their ability to solve problems in creative ways.

Our professors' research spans a broad range of topics – from digital agriculture and robotics to subatomic physics (especially neutron and neutrino particles) and material science to the use of magnetic resonance imaging (MRI) in diagnosing disease, to the inner workings of black holes, higher-dimensional cosmology, superstrings, and quantum gravity. Students can participate in these research activities, and many find paid summer employment with the various research groups.

Students can study for their **Bachelor of Science degree (3-year, 4-year, or Honours).** Different specialized streams are also available for each degree type, such as: Applied Physics, Chemical Physics, Computational Physics, Medical Physics, and Mathematical Physics. If you're interested in becoming a teacher, Physics can be used as a teachable subject in our Education program.

Also: Please see related fact sheets on "Medical Physics" and "Computational Physics."

SAMPLE CAREERS

About half of our students continue their research activities in some of the top graduate schools in North America, such as Cornell, the University of British Columbia, McGill, Waterloo, McMaster, and the University of Toronto. Many graduates are hired by places such as: JCA Technologies, Farmers Edge, Pluto Ventures, Ubisoft, Nvidia, Blue Origin, Boeing, 3M, Price Industries, and Cubresa Inc, in roles ranging from computational fluid dynamics (CFD) analyst, to aerospace engineer, to data xcientist.

SAMPLE COURSES

Astronomy is a non-mathematical course that gives students a general introduction to the ideas and processes of science as well as the formation and evolution of the universe.

Scientific Computing with Python is a second-year course where students learn how to create Python data analysis programs with data visualization and publication quality figures.

Quantum Mechanics is a third-year course on the wave properties of matter, the Schrodinger equation, and applications of quantum physics.

MORE SAMPLE COURSES

- Astronomy
- Intermediate & Advanced Laboratory
- The Physics of Music
- The Study of Time
- Numeric & Symbolic Computing
- Introduction to General Relativity
- Subatomic Physics
- Medical Imaging

SAMPLE FIRST YEAR

PHYS-1101(6) Foundations of Physics
PHYS-2103(3) Numeric & Symbolic Computing
MATH-1103 (3) Introduction to Calculus I AND MATH-1104 (3) Introduction to Calculus II
OR the equivalent MATH-1101(6) Introduction to Calculus
RHET-1103(3) Academic Writing: Science, or any other section of Academic Writing (if required)
6 credit hours Humanities
CHEM-1111(3) Introduction to the Chemical Properties of Matter (optional)
CHEM-1112(3) Basic Principles of Chemical Reactivity (optional)
3 credit hours Elective

NOTE: *This sample first year is representative of the courses you may take. For many of our programs, you may choose another set of courses and still be well on your way to a degree. Also, for most programs you do not have to take 30 credit hours (five full courses) in your first year.*

"I like everything about the physics department. The professors are incredibly talented, friendly, and helpful with advice for those trying to figure out what to do after graduation. As well, undergraduate students have many opportunities to do research."

Allison Kolly, BSc (Honours),
who has completed an MSc in Atmospheric & Oceanic Sciences from McGill University

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REQUIRED HIGH SCHOOL COURSES

In addition to meeting The University of Winnipeg's general admission requirements, you must have **Physics 40S** and **Pre-Calculus Mathematics 40S**. However, interested and motivated students without these prerequisites are also encouraged to contact the department. Introductory Physics (PHYS-1301) requires only **Pre-Calculus Mathematics 40S** or **Applied Mathematics 40S**. Courses in Astronomy, Cosmology, and Scientific Computing do not require the above prerequisites.

HOW TO APPLY

For details on application requirements and deadlines, and to apply online, please visit: **uwinnipeg.ca/apply**

For more information contact a student recruitment officer at welcome@uwinnipeg.ca or 204.786.9844. In any case where the University's Academic Calendar and this fact sheet differ, the current Calendar takes precedence.

CONTACT US

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