



FACULTY OF SCIENCE

PHYSICS

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

Research in physics has led to revolutionary discoveries like lasers, magnetic resonance imaging, fibre optic communications, and transistors. These developments, and those following from fundamental physics research, have had, and will have, great importance upon human society in the twenty-first century.

The University of Winnipeg has a nationally recognized Physics Department, which offers an excellent learning atmosphere, fostered by small class sizes and individual attention from professors. Our professors' research spans a broad range of topics – from subatomic physics (especially neutron and neutrino particles), the inner workings of the nucleus, and 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 often participate in these research activities and many find 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 sheet on "Medical Physics."

SAMPLE CAREERS

Our program emphasizes critical thinking, decision making, and creative problem solving skills. These qualities have helped our graduates to secure employment in many areas, including computers, engineering, finance, geophysics, lasers and optics, medical physics, military applications, space science, teaching, and high-tech, academic, and corporate research.

SAMPLE COURSES

Foundations of Physics is a calculus-based first-year course which provides students with a working knowledge of basic concepts underlying modern physics. It is primarily for Physics majors, but it is also useful for students interested in science.

Electricity & Magnetism is a second year course which covers circuits, magnetic effects of a current, electromagnetic induction, and properties of dielectric and magnetic materials.

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

MORE SAMPLE COURSES

- Scientific Computing
- Astronomy
- Introduction to General Relativity
- Numeric & Symbolic Computing
- Subatomic Physics
- Electrodynamics
- Fundamentals of Digital Electronics
- 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

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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