THE UNIVERSITY OF WINNIPEG

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

Mathematics
Mathematics is the science of number, form, and logic.

Although mathematics may be the oldest of the sciences, it is a constantly growing field. Evolving theories and the demands of new and varied applications continually effect change throughout mathematics, from the frontiers of research to the teaching of introductory courses.

Some people describe mathematics as the realm of numerical problem solving. Others see it as the study of functions. Still others view mathematics as the study of structures such as geometric shapes and computer networks. At its most fundamental level, mathematics is a way of thinking. Mathematicians are in the business of logical reasoning.

A typical course in modern mathematics begins with nothing more than a few definitions and a modest set of assumptions. From such a meagre starting point, a mathematician is trained to build a system of truths, a set of tools, via the rigours of logic. The subject area can be quite abstract, such as Real Analysis, or can be motivated by practical applications, such as Differential Equations.

As a student in the Mathematics program at The University of Winnipeg, you have flexibility in designing your course of study. There are core courses that all majors must take, such as the introductory courses in calculus, algebra and discrete mathematics, but you may also choose from a diverse group of additional courses. You may choose to study such classical topics as analysis and topology, or subjects such as combinatorics and graph theory, which touch on newer theories with applications in today's modern technology.

Depending on the courses you choose, this program can lead to a **Bachelor of Science (3-year, 4-year, or Honours) or a Bachelor of Arts (3-year or 4-year)** with a *Major in Mathematics*. You may also combine your mathematics major with another subject.

Students taking a 4-year degree in another major may choose to add a *Minor in Mathematics* as a secondary area of interest.

SAMPLE CAREERS
Mathematics is highly valuable in our technological society. A mathematical background will provide a basis for entry into almost any technological field. Graduates of The University of Winnipeg's Mathematics program can look forward to employment in areas related to finance, business, computers, insurance, telecommunications, engineering, physics, biology, or economics.

In addition, a mathematics degree is a great choice for students destined for professional programs such as medicine, dentistry, management, or law.

SAMPLE COURSES
Discrete Mathematics is a first-year course that introduces students to mathematical reasoning. In addition to training students to write logical arguments, this course explores problems dealing with number theory, relations, functions, and counting techniques.
Applied Algebra is a second-year course that introduces abstract algebraic structures, together with some of their applications to data transmission, cryptography (secret codes), and experimental design.
Group Theory is a third-year course that studies addition or multiplication in abstract structures known as "groups". Originally introduced to study roots of equations, it is now considered essential to the understanding of algebra, crystallography, and quantum mechanics.

MORE SAMPLE COURSES
Intro to Calculus I and II	Linear Algebra I and II
Differential Equations I and II	Number Theory
Combinatorics	Complex Analysis
Mathematical Statistics I and II	Rings & Fields
Networks and their Applications	Topology

A UNIQUE OPPORTUNITY: DUAL DEGREE IN MATH AND ENGINEERING
The University of Winnipeg and the College of Science and Engineering in Minnesota have teamed up to offer an exciting dual degree program in engineering for students who want to attend one of the top engineering schools in North America. Students begin the dual degree at The University of Winnipeg by studying Mathematics, Biology, Chemistry, Geography, or Physics. Those students who complete a 3-year Bachelor of Science degree in any of these majors, and who have a minimum GPA of 2.5 – 2.8 (depending on the program), are guaranteed a place in its Engineering program. Students complete the dual degree with a final two years of study in Minneapolis at the Institute of Technology (IT), where they will earn an engineering degree. Upon graduation from the dual degree program, you can make application to practice engineering in the Canadian province or other jurisdiction in which you wish to practice. For more information about Engineering, contact Ben Sharpe at the University of Minnesota by calling **612.624.8504** or emailing **sharp003@umn.edu**

DID YOU KNOW?
• Many students have opportunities to work with researchers in this department. For example, Natural Sciences and Engineering Research Council of Canada (NSERC) Undergraduate Summer Research award provides a student with at least $5500 to do research with a department member for one summer. On average, four students work as research assistants with faculty members over the summer with an average of two or three of these students receiving USRA awards.
• If you are interested in becoming a teacher, Mathematics can be used as a teachable major in the Education program.

SAMPLE FIRST YEAR
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.

MATH-1103 (3) Introduction to Calculus I
MATH-1104 (3) Introduction to Calculus II
MATH-1401 (3) Discrete Mathematics
MATH-1201 (3) Linear Algebra I
RHET-1103(3) Academic Writing: Science or any other section of Academic Writing (if required)
6 credit hours Humanities
Note: MATH-1101 (6) is equivalent to MATH-1103(3) and MATH-1104(3)
9 credit hours of electives, for example: ACS-1803(3) Introduction to Computer-Based Systems, PHYS-1101(6) Foundations of Physics I, STAT-1301(3) Statistical Analysis I & STAT-1302(3) Statistical Analysis II, Additional Humanities courses.

REQUIRED HIGH SCHOOL COURSES
In addition to meeting The University of Winnipeg's general admission requirements, you must have Pre-Calculus Mathematics 40S. Students who are lacking the prerequisite Pre-Calculus Mathematics 40S should enroll in MATH-0041 AND MATH 0042, Mathematical Access I and II which together serve as a prerequisite replacement for Pre-Calculus Mathematics 40S.

HOW TO APPLY
To find out more information on application requirements, deadlines, and to access the application, please visit uwinnipeg.ca/apply.

CONTACT US
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