



FACULTY OF SCIENCE

# MATHEMATICS

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

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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. Some areas of mathematics can be quite abstract, such as Real Analysis, or can be motivated by practical applications, such as Differential Equations.

At UWinnipeg, you have flexibility in designing your course of study. There are core courses that all mathematics majors must take, but you will also choose from a diverse group of additional courses, in areas such as topology, combinatorics and graph theory.

This program leads 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**. If you are interested in becoming a teacher, mathematics can be used as a teachable major or a teachable minor in the Education program. Students taking a degree in another major may choose to add a **Minor** in mathematics as a secondary area of interest.

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## SAMPLE CAREERS

Graduates find employment in areas related to finance, business, computers, insurance, telecommunications, engineering, physics, biology, or economics. 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**, a second-year course, 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.

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## MORE SAMPLE COURSES

- Differential Equations I and II
- Number Theory
- Combinatorics
- Complex Analysis
- Mathematical Statistics I and II
- Rings & Fields
- Networks and their Applications
- Topology

## SAMPLE 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

9 credit hours of electives

\* Note: MATH-1101 (6) is equivalent to MATH-1103(3) and MATH-1104(3)

**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.

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***“The faculty at UWinnipeg is some of the best in the country, and I also had a lot of opportunities to do research starting early in my degree, which is uncommon at larger universities.”***

- Adam Borchert, BSc (Math), a former Machine Learning Software Developer at Sightline Innovations, who is now completing a PhD in mathematics at University of Cambridge.

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## 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

For details on application requirements and deadlines, and to apply online, please visit:  
**[uwinnipeg.ca/apply](http://uwinnipeg.ca/apply)**

For more information contact a student recruitment officer at [welcome@uwinnipeg.ca](mailto: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

**Department of Mathematics**

**P** 204.786.9834

**E** [mathstats@uwinnipeg.ca](mailto:mathstats@uwinnipeg.ca)

**W** <http://www.uwinnipeg.ca/mathstats/>