



# THE UNIVERSITY OF WINNIPEG

For more information visit [www.uwinnipeg.ca](http://www.uwinnipeg.ca) or contact a student recruitment officer at [welcome@uwinnipeg.ca](mailto:welcome@uwinnipeg.ca) or 204.786.9844. In any case where The University of Winnipeg Course Calendar and this fact sheet differ, the current Calendar takes precedence.

## Chemistry

***Chemistry is the study of the composition and properties of matter, the transformations they undergo, and the associated energies.***

Chemists are at the forefront of unravelling the mysteries of the most complex chemical systems. If you are interested in understanding the structure of matter and how it behaves on a molecular level, you may be drawn to the field of chemistry.

As a “central science,” chemistry provides excellent preparation for a career in science as a teacher, a professional (e.g. medical doctor, pharmacist), a technician, or a researcher/academic. Chemical science plays a role in dealing with many challenges today, from pollution and the scarcity of fresh water, to food production and the development of vaccines and drugs. At The University of Winnipeg you can specialize in analytical, organic, inorganic, or physical chemistry; or in biochemistry. More information on “Biochemistry” is available on a separate fact sheet. There is also a joint four-year University of Winnipeg/Red River College program (see the “Applied Chemistry” fact sheet for more details).

Students in the 4-year, Honours, or Applied Chemistry program may apply to take a co-operative option, integrating academic coursework with 12 months of career-related experience. The Chemistry Department offers research and work opportunities through summer jobs and a fourth year “Research Projects” course. The skills gained through these research and work opportunities are valuable in future employment and for admission to graduate and professional schools.

This program leads to a **Bachelor of Science degree (3-year, 4-year, or Honours).**

### SAMPLE COURSES

**Introduction to the Chemical Properties of Matter** and **Basic Principles of Chemical Reactivity** are first-year courses that examine the principles of the four core areas of chemistry: organic, inorganic, analytical, and physical. Laboratory work introduces some of the basic techniques of practical chemistry.

**Organic Chemistry I and II** are second-year courses that introduce the chemistry of carbon and describe the nature of organic compounds and their behaviours. Nomenclature and stereochemistry are described, as well as methods for the synthesis and characterization of these compounds.

**Inorganic Chemistry I** is a second-year course that describes molecular bonding and structures. Emphasis is on synthesis, reactions, and structures of the main group compounds.

**Thermodynamics and Kinetics** is a second-year course that describes the fundamental role of heat, energy, entropy, rates, and molecular mechanisms in chemical reactions and other processes involving gases, liquids, and solids.

**Intermediate Biochemistry I and II** are two third-year courses that describe the structures of biologically important compounds and deal with chemical processes of living materials such as digestion, absorption, respiration, and metabolism.

**Research Projects in Chemistry** is a fourth-year course for selected students involving research in an area of Chemistry under the supervision of a faculty member.

## MORE COURSES

Atoms, Molecules, and Spectroscopy  
Quantitative Chemical Analysis  
Molecular Enzymology  
Methods in Biochemistry  
Organic Synthesis

## SAMPLE CAREERS

Chemistry graduates may find employment in federal or provincial government laboratories, industrial laboratories, hospital laboratories, or with pharmaceutical or chemical companies.

## WHAT OUR STUDENTS SAY...

"One thing that I really liked about The University of Winnipeg is that virtually all the Chemistry professors knew me by first name, even the new professors who never taught me. I had many, many opportunities to talk to my professors about science, applying to graduate school, and life. The small size of the department allowed me to gain access to the professors, get valuable hands-on experience in the labs as both a student and a lab teaching assistant, and participate in the organization of an undergraduate chemistry conference." - *Angele Maki (BSc '98 Chemistry) recently completed her PhD in Chemistry at Stanford University.*

"There is a lot of exciting research done here, and undergraduate students work independently on challenging projects. Students benefit from the University's commitment to education and training." - *Leslie May (BSc '99 Chemistry)*

"Being a student at The University of Winnipeg was great! The professors in the Chemistry Department were amazing: they always took time to answer questions, offer advice on what to do after graduation, or even joke around with us. During summer sessions, I experienced scientific research first hand as a Research Assistant. This experience gave me an advantage over students from larger institutions where undergraduate students may not have access to actual research experience." - *Patrick Shipman (BSc '04 Chemistry)*

## UNIQUE OPPORTUNITY FOR CHEMISTRY MAJORS

The University of Winnipeg and the University of College of Science and Engineering 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 their 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 those majors and who have a minimum GPA of 2.5-2.8 (depending on the program) are **guaranteed a place in IT's Engineering program**. They complete the dual degree with a final two years of study, this time in Minneapolis at 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, contact:

Ben Sharpe  
The University of Minnesota  
105 Lind Hall, 207 Church Street SE  
Minneapolis, MN 55455  
Phone: 612.624.8504  
Email: [sharp003@umn.edu](mailto:sharp003@umn.edu)  
Web: [www.it.umn.edu](http://www.it.umn.edu)

## DID YOU KNOW?

If you are interested in becoming a teacher, Chemistry can be used as a teachable major or minor in the Education Program.

## THE CHEMISTRY CLUB

The Chemistry Club is an active students' group, participating in a variety of social and fundraising activities.

## 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.*

CHEM-1111(3) Introduction to the Chemical Properties of Matter

CHEM-1112(3) Basic Principles of Chemical Reactivity

BIOL-1115(3) Cells and Cellular Processes

BIOL-1116(3) Evolution, Ecology, and Biodiversity

MATH-1101(6) Introduction to Calculus or Math 1103 (3) Introduction to Calculus I and Math 1104 (3) Introduction to Calculus II

RHET-1103(3) Academic Writing: Science or any other section of Academic Writing (if required)

6 credit hours Humanities; for example:

ENGL-1001(6) English 1

ENGL-1000(3) English 1A

ENGL-1003(3) English 1B

PHIL-2202(3) Ethics in Medicine and the Law

3 credit hours Elective; for example:

GEOG-1202(3) Introductory Earth Science

ANTH-1003(3) Physical Anthropology and Archaeology

### **REQUIRED HIGH SCHOOL COURSES**

In addition to meeting The University of Winnipeg's general admission requirements, you must have **Chemistry 40S** and **either Pre-Calculus Mathematics 40S or Applied Mathematics 40S**.

### **HOW TO APPLY – Domestic Student**

Apply online at [uwinnipeg.ca](http://uwinnipeg.ca) or pick up an Application for Admission from your high school counsellor's office or the Admissions Office at The University of Winnipeg. To meet Scholarship deadline submit your application and \$80 application fee by **March 1st**.

### **HOW TO APPLY – International Student**

Apply online at [uwinnipeg.ca/index/intl-apply](http://uwinnipeg.ca/index/intl-apply) and submit all official documents by mail. To meet Scholarship deadline submit application, fee, and documents by **March 1st**. International application fee is \$100, which includes a one-time courier fee.

### **CONTACT US**

Dr. Désirée Vanderwel

Department Chair

Phone: 204.789.1483

Email: [d.vanderwel@uwinnipeg.ca](mailto:d.vanderwel@uwinnipeg.ca)

<http://chemistry.uwinnipeg.ca/>



[Subscribe to our RSS feed](#)



[Follow us on Twitter](#)



[Like us on Facebook](#)