



# 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.

## Biology

***Biology is the study of any form of life, from the DNA molecule to the interactions of organisms within the various ecosystems of the earth.***

Biology is a broad discipline, which includes the subject areas of botany, zoology, microbiology, cell biology, ecology, and genetics. It examines all life forms from the simple to the complex, and is an ideal partner to study in chemistry, physics, and mathematics. If you have an aptitude for science and possess a keen desire to understand the living world, you will find the study of biology very rewarding.

Within the Department of Biology at The University of Winnipeg, our faculty teaches a wide range of courses and offer active research programs in botany ecology, forest ecology, mosquito biology, evolutionary genetics, molecular biology, evolutionary physiology, soil microbiology and remediation, limnology, bioinformatics, genomics, dendrochronology, behavioural biology of birds, effects of UV radiation on the environment, and cell biology. Biology can be explored in several different programs of study at The University of Winnipeg: a 3-year, 4-year, or 4-year Honors Bachelor of Science degree.

The **3-year B.Sc.** is a 90 credit-hour degree (30 credit hours must be in Biology). It satisfies the entrance requirement for most professional schools, such as medicine, dentistry and education. The **4-year B.Sc.** is a 120 credit-hour degree, as is the **4-year Honours B.Sc.**, both of which require a total of 120 credit hours (48-54 credit hours must be in Biology). Both the 4-year B.Sc. and the 4-year Honours B.Sc. prepare you for advanced study in biology, and for many jobs in government, consulting firms, research labs, or industry.

**NOTE: Applied Biology is a joint program offered by The University of Winnipeg in conjunction with Red River College.** It allows you to obtain a 4-year bachelor of science. This program is described in a separate fact sheet.

### SAMPLE CAREERS

These programs of study in Biology prepare graduates for work in government laboratories, university research laboratories, scientific consulting organizations, pharmaceutical companies, conservation and wildlife management, and the scientific publishing industry. Graduates may enter dental, medical, veterinary science, and education faculties. Those who have obtained the 4-year B.Sc. or Honours B.Sc. are well prepared to enter graduate programs, ultimately leading to careers as scientists.

### SAMPLE COURSES

**Evolution, Ecology, and Biodiversity** is a first-year course emphasizing the evolutionary and ecological processes that underlie the relationship between an organism and its environment. Topics include natural selection and the origin of species, systematics and taxonomy, the origin of biological diversity, growth and reproductive strategies, and communities and ecosystems.

**Cells and Cellular Processes** is a first-year course introducing the cellular level of organization. It covers cytology, cell metabolism, patterns of inheritance, and mechanisms of cellular control.

**Biology of Vascular Plants** is a second-year course exploring the evolution and ecology of nine groups of vascular plants. Their success in ancient and contemporary environments is examined through consideration of structural diversity, life history, and reproductive biology. Emphasis is placed on local flora.

**Genetics** is a second-year course dealing with the processes of heredity at all levels, from molecules to populations. It provides a basis for the evaluation of contemporary issues such as genetic engineering,

environmental mutagens, and gene therapy. Topics include extensions to Mendelian analysis, mapping techniques, mutation, the genetics of bacteria and viruses, the gene, and recombinant DNA technology.

**Molecular Genetics and Genomics** is a third-year course dealing with basic genetic techniques and phenomena at the molecular level. Topics include transcription, translations, and the genetic code; organization of genetic material in prokaryotes and eukaryotes; bioinformatics; and recombinant DNA and its applications.

#### MORE SAMPLE COURSES

Cell Biology

Comparative Animal Physiology

Comparative Chordate Zoology

Forest Ecology

Microbial Ecology

Microorganisms and Disease

Parasites and Disease

Quantitative and Theoretical Biology

Urban Forestry

#### WHAT OUR STUDENTS SAY...

"Until I attended a larger university, I didn't fully appreciate how unique The University of Winnipeg is. The small class sizes and the available and approachable professors really give University of Winnipeg students an advantage. Of my fellow graduate students, I had the most hands-on experience working in labs during my undergraduate career. The Honours Thesis program in the Biology Department is designed to give students the experience of drawing up a research proposal, conducting research, presenting their data, writing a thesis, and orally defending their work. It follows the graduate school experience exactly – but within a more supportive setting. My education from The University of Winnipeg has given me an excellent foundation for a career in Biochemistry and Biology." - *Barb Gajda (B.Sc. Hons. '04 Biochemistry and Biology), recipient of a Natural Sciences and Engineering Research Council (NSERC) Post-Graduate Scholarship, is completing her master of science in Zoology at the University of British Columbia. She is researching the neural mechanisms behind mammalian respiration.*

"I credit a lot of my success to the personal attention and research opportunities available at The University of Winnipeg, because this is a university with an undergraduate focus, professors are very accessible to undergraduate students." - *David Selchen, (B.Sc. '97 Biology and Psychology), Rhodes Scholar*

#### DID YOU KNOW?

- If you are interested in becoming a teacher, Biology can be used as a teachable major or minor in the Education Program.
- Through the University of Winnipeg/University of Minnesota dual degree program in Engineering, students who complete a 3-year Bachelor of Science in Biology with a minimum GPA of 2.5 - 2.8 may be eligible to go on to earn an Engineering degree in two years at the College of Science and Engineering. For more information, contact Ben Sharpe at the University of Minnesota by calling **612.624.8504** or emailing [sharp003@umn.edu](mailto:sharp003@umn.edu)

#### 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.

BIOL-1115(3) Cells and Cellular Processes

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

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

CHEM-1112(3) Basic Principles of Chemical Reactivity

STAT-1201(6) Introduction to Statistical Analysis OR

STAT-1501(3) Elementary Biological Statistics I

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

6 credit hours Humanities

3 or 6 credit hours Electives, depending on interest; for example:

GEOG-1201(3) Introductory Atmospheric Science

GEOG-1202(3) Introductory Earth Science

ENGL-1000(3) English 1A

MATH-1103 (3) Introduction to Calculus I AND MATH-1104 (3) Introduction to Calculus II

OR the equivalent MATH-1101(6) Introduction to Calculus

## REQUIRED HIGH SCHOOL COURSES

In addition to meeting The University of Winnipeg's general admission requirements, you must have standing in **Chemistry 40S** and **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

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<http://www.uwinnipeg.ca/index/biology-index>



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