

BIO-MEDICAL SCIENCE (BIOM)

Department of Biomedical Sciences and Department of Human Health and Nutritional Sciences

This joint program of the Department of Human Health and Nutritional Sciences (<https://www.uoguelph.ca/hhns/>) and the Department of Biomedical Sciences (<https://ovc.uoguelph.ca/biomedical-sciences/biomedical-sciences/>) provides students with a broad and integrated foundational overview of human and animal health through the study of function (biochemistry and physiology), structure (anatomy and histology), and paraclinical sciences (epidemiology and pharmacology). The program prepares students well for more advanced studies or applied training in many health-related fields including clinical practice, business, government, research and education. Through the use of electives, students may structure a program emphasizing aspects of health and disease. For more information on recommended electives contact the Faculty Advisor of the major.

In addition, this program is designed to partially meet the current requirements for entry into medical schools in Ontario (a student interested in meeting these requirements should check the present admission requirements for the medical schools); as well as entry into the DVM program of the Ontario Veterinary College (<https://ovc.uoguelph.ca/>).

Live animals and/or animal tissues are used for teaching purposes in some courses in the Bio-Medical Science Major. This must be accepted by students admitted to the program. All animals are protected under the Animals for Research Act of Ontario (1980), the Guidelines for the Care and Use of Experimental Animals (Canadian Council on Animal Care (<https://www.ccac.ca/>)), and the Animal Care Policies (<https://www.uoguelph.ca/research/document/university-guelph-animal-care-policy-and-procedures/>) of the University of Guelph.

Students who are admitted into the Bio-Medical Science major from high school must meet additional requirements to continue in the major. Continuation from first to second year is based on the cumulative average in the first two semesters (total of 5.00 credits), including the eight core courses as prescribed by the Schedule of Studies (see below). Students with a minimum average of 75% average will be guaranteed continuation in this major. For students with a 70-74.9% average, continuation will be competitive based on available spaces. Students with an average below 70% will be changed to the Biological Science major. Students may subsequently change to another B.Sc. major of their choice.

B.Sc. students who wish to declare the specialization at the end of or beyond first year must apply directly to the Department of Biomedical Sciences by the last day of classes in the winter semester and meet the same requirements specified above.

Admission to the major will be based on the cumulative average in the two semesters (total of 5.00 credits) preceding application to the major (normally fall and winter). Acceptance will be competitive based on available spaces. Students with an average below 70% will not be considered for admission to the major. All decisions will be made at the end of June.

Major (Honours Program)

A minimum of 20.00 credits is required.

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: https://www.uoguelph.ca/bsc/revised_SS (https://www.uoguelph.ca/bsc/revised_SS/)

Code	Title	Credits
Semester 1		
BIOL*1080	Biological Concepts of Health	0.50
CHEM*1040	General Chemistry I	0.50
MATH*1080	Elements of Calculus I	0.50
PHYS*1080	Physics for Life Sciences	0.50
0.50 electives or restricted electives		0.50
Semester 2		
BIOL*1070	Discovering Biodiversity	0.50
BIOL*1090	Introduction to Molecular and Cellular Biology	0.50
CHEM*1050	General Chemistry II	0.50
PHYS*1070	Physics for Life Sciences II	0.50
0.50 electives or restricted electives		0.50
Semester 3		
(see admission statement)		
BIOC*2580	Introduction to Biochemistry	0.50
MBG*2040	Foundations in Molecular Biology and Genetics	0.50
STAT*2040	Statistics I	0.50
1.00 electives or restricted electives		1.00
Semester 4		
MCB*2050	Molecular Biology of the Cell	0.50
NUTR*3210	Fundamentals of Nutrition	0.50
BIOM*3200	Biomedical Physiology ¹	0.50-1.00
or HK*2810	Human Physiology I - Concepts and Principles	
Electives or Restricted Electives to a maximum of 2.50 total credits in this semester		1.00
Semester 5		
BIOC*3560	Structure and Function in Biochemistry	0.50
Electives or Restricted Electives to a maximum of 2.75 total credits in this semester. ^{2,3}		2.25
Semester 6		
BIOM*3090	Principles of Pharmacology	0.50
PATH*3610	Principles of Disease	0.50
POPM*3240	Epidemiology	0.50
Electives or Restricted Electives to a maximum of 2.75 total credits in this semester		1.25
Semester 7		
2.50 electives or restricted electives		2.50
Semester 8		
2.50 electives or restricted electives		2.50

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If HK*2810 Human Physiology I - Concepts and Principles is selected, then HK*3810 Human Physiology II - Integrated Systems must be taken in Semester 5

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BIOM*3210 Critical Thinking in the Health Sciences is recommended.

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As part of the electives or restricted electives, students must select HK*3810 Human Physiology II - Integrated Systems in semester 5 if HK*2810 Human Physiology I - Concepts and Principles was selected in semester 4

Restricted Electives

Code	Title	Credits
Anatomy Elective		
Select one of the following:		
BIOM*3010 & BIOM*3040	Biomedical Comparative Anatomy and Medical Embryology	1.25
HK*3402	Human Anatomy: Dissection	0.75
HK*3502	Human Anatomy	0.75
Immunology Elective		
ANSC*4650 or MICR*3230	Comparative Immunology Immunology	0.50
Advanced Study Electives		
Select 2.00 credits from the following:		
BIOM*4030	Endocrine Physiology	0.50
BIOM*4050	Biomedical Aspects of Aging	0.50
BIOM*4070	Biomedical Histology	0.50
BIOM*4090	Pharmacology	0.50
BIOM*4110	Mammalian Reproductive Biology	0.50
BIOM*4150	Cancer Biology	0.50
BIOM*4180	Cardiology	0.50
BIOM*4300	Biomedical Communications	0.50
BIOM*4500	Literature-based Research in Biomedical Sciences	0.50
BIOM*4510	Research in Biomedical Sciences	1.00
BIOM*4522	Research in Biomedical Sciences	1.00
HK*4070	Clinical Biomechanics	0.50
HK*4230	Advanced Study in Human Health and Nutritional Sciences	0.50
HK*4340	Genomics: Exercise and Disease	0.50
HK*4360	Research in Human Health and Nutritional Sciences	1.00
HK*4372	Research in Human Health and Nutritional Sciences II	0.50
HK*4442	Advanced Study in Human Anatomy	1.00
HK*4460	Regulation of Human Metabolism	0.50
NUTR*4320	Nutrition and Metabolic Control of Disease	0.50
NUTR*4360	Current Issues in Nutrigenomics	0.50
NUTR*4510	Toxicology, Nutrition and Food	0.50
TOX*4000	Medical Toxicology	0.50
Liberal Education Electives		
At least 2.00 credits of Liberal Education electives ⁴		2.00

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The list of Liberal Education electives for B.Sc. students can be found at: <https://www.uoguelph.ca/bsc/>

Credit Summary

(20.00 Total Credits)

Code	Title	Credits
First year science credits		4.00
Required science courses semesters 3 – 8 ⁵		5.50-5.75
Restricted electives ⁶		3.75-4.00
Approved Science electives depending on which anatomy and physiology courses are completed above.		2.25-2.75
Liberal Education electives		2.00
Free electives - any approved elective for B.Sc. students		2.00
Total Credits		20

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5.75 with HK*2810 Human Physiology I - Concepts and Principles, HK*3810 Human Physiology II - Integrated Systems) or 5.50 (with BIOM*3200 Biomedical Physiology)

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4.00 with HK*3401 Human Anatomy: Dissection/HK*3402 Human Anatomy: Dissection or HK*3501 Human Anatomy: Prosection/HK*3502 Human Anatomy) 3.75 (with BIOM*3010 Biomedical Comparative Anatomy, BIOM*3040 Medical Embryology) (Restricted elective #1, #2 and #3)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.