

# NUTRITIONAL AND NUTRACEUTICAL SCIENCES (NANS)

## Department of Human Health and Nutritional Sciences, College of Biological Science

The Nutritional and Nutraceutical Sciences major is concerned with understanding the contribution of food, beverage and nutritional supplement consumption to growth, development of optimal biological function, maintenance of health, and treatment of disease.

If lacking the fundamentals of word processing, spread sheet use and data management, the student should select CIS\*1200 Introduction to Computing as early in the program as possible.

## Major Requirements (Honours)

This is a major within the degree: Bachelor of Science.

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. A total 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
<b>Semester 1</b>		
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 Liberal Education electives		0.50
<b>Semester 2</b>		
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 Liberal Education electives		0.50
<b>Semester 3</b>		
BIOC*2580	Introduction to Biochemistry	0.50
MBG*2040	Foundations in Molecular Biology and Genetics	0.50
STAT*2040	Statistics I	0.50
0.50 electives or restricted electives		0.50
0.50 Liberal Education electives		0.50
<b>Semester 4</b>		
BIOC*3560	Structure and Function in Biochemistry	0.50
HK*2810	Human Physiology I - Concepts and Principles	0.50
MCB*2050	Molecular Biology of the Cell	0.50
NUTR*3210	Fundamentals of Nutrition	0.50
0.50 Liberal Education electives		0.50

### Semester 5

HK*3810	Human Physiology II - Integrated Systems	0.75
NUTR*3330	Micronutrients, Phytochemicals and Health	0.50
NUTR*3360	Lifestyle Genomics	0.50
NUTR*3390	Applied Nutritional and Nutraceutical Sciences I	0.75

### Semester 6

BIOM*3090	Principles of Pharmacology	0.50
NUTR*4090	Functional Foods and Nutraceuticals	0.50
NUTR*4320	Nutrition and Metabolic Control of Disease	0.50
NUTR*4330	Applied Nutritional and Nutraceutical Sciences II	0.75

Electives or Restricted Electives to a maximum of 2.75 total credits in this semester.

### Semester 7

NUTR*4210	Nutrition, Exercise and Energy Metabolism	0.50
NUTR*4510	Toxicology, Nutrition and Food	0.50
1.50 electives or restricted electives		1.50

### Semester 8

2.50 electives or restricted electives		2.50
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## Restricted Electives

- A minimum of 2.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: <https://www.uoguelph.ca/bsc/>
- 1.00 credits from the following:

Code	Title	Credits
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*4371	Research in Human Health and Nutritional Sciences I	0.50
HK*4372	Research in Human Health and Nutritional Sciences II	0.50
HK*4510	Teaching, Learning and Knowledge Transfer	1.00
HK*4511	Teaching, Learning & Knowledge Transfer I	0.50
HK*4512	Teaching, Learning & Knowledge Transfer II.	0.50
HK*4460	Regulation of Human Metabolism	0.50
NUTR*4360	Current Issues in Nutrigenomics	0.50
PATH*3610	Principles of Disease	0.50

## Credit Summary

(20.00 Total Credits)

Code	Title	Credits
First year science core		4.00
Required science courses semesters 3 - 8		9.25
Restricted Electives (# 2 in restricted electives list)		1.00
Approved Science Electives		1.75
Liberal Education Electives (# 1 in restricted electives list)		2.00

Free Electives - any approved electives for B.Sc. students	2.00
<b>Total Credits</b>	<b>20</b>

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

## Co-op Requirements (Honours)

This is a major within the degree: Bachelor of Science.

The Co-op program in Nutrition and Nutraceutical Sciences is a five-year program, including four work terms. Students must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <https://recruitguelph.ca/cecs/> (<https://www.recruitguelph.ca/cecs/>)).

### Academic and Co-op Work Term Schedule

Year	Fall	Winter	Summer
1	Academic Semester 1	Academic Semester 2	Off
2	Academic Semester 3, COOP*1100	Academic Semester 4	COOP*1000 Work Term I
3	Academic Semester 5	Academic Semester 6	COOP*2000 Work Term II
4	COOP*3000 Work Term III	COOP*4000 Work Term IV	Off
5	Academic Semester 7	Academic Semester 8	N/A

Please refer to the Co-operative Education program policy with respect to work term performance grading, work term report grading and program completion requirements.

For additional program information, students should consult with their Co-op Coordinator and Co-op Faculty Advisor, listed on the Co-operative Education web site.

### Credit Summary

(22.00 Total Credits)

Code	Title	Credits
	First year science core	4.00
	Required science courses semester 3-8	9.25
	Restricted elective (# 2, in restricted electives list)	1.00
	Approved Science Elective	1.75
	Liberal Education Elective (# 1, in restricted electives list)	2.00
	Free Electives	2.00
	Co-op Work Terms	2.00
<b>Total Credits</b>		<b>22</b>

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

## Recommended Program Sequence

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
<b>Semester 1 - Fall</b>		
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 Liberal Education electives	0.50
<b>Semester 2 - Winter</b>		
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 Liberal Education electives	0.50
<b>Summer Semester</b>		
No academic semester or work term		
<b>Semester 3 - Fall</b>		
BIOC*2580	Introduction to Biochemistry	0.50
COOP*1100	Introduction to Co-operative Education	0.00
MBG*2040	Foundations in Molecular Biology and Genetics	0.50
STAT*2040	Statistics I	0.50
	0.50 electives or restricted electives	0.50
	0.50 Liberal Education electives	0.50
<b>Semester 4 - Winter</b>		
BIOC*3560	Structure and Function in Biochemistry	0.50
HK*2810	Human Physiology I - Concepts and Principles	0.50
MCB*2050	Molecular Biology of the Cell	0.50
NUTR*3210	Fundamentals of Nutrition	0.50
	0.50 Liberal Education electives	0.50
<b>Summer Semester</b>		
COOP*1000	Co-op Work Term I	0.50
<b>Semester 5 - Fall</b>		
HK*3810	Human Physiology II - Integrated Systems	0.75
NUTR*3330	Micronutrients, Phytochemicals and Health	0.50
NUTR*3360	Lifestyle Genomics	0.50
NUTR*3390	Applied Nutritional and Nutraceutical Sciences I	0.75
<b>Semester 6 - Winter</b>		
BIOM*3090	Principles of Pharmacology	0.50
NUTR*4090	Functional Foods and Nutraceuticals	0.50
NUTR*4320	Nutrition and Metabolic Control of Disease	0.50
NUTR*4330	Applied Nutritional and Nutraceutical Sciences II	0.75
	Electives or Restricted Electives to a maximum of 2.75 total credits in this semester.	0.50
<b>Summer Semester</b>		
COOP*2000	Co-op Work Term II	0.50

**Fall Semester**

COOP*3000	Co-op Work Term III	0.50
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**Winter Semester**

COOP*4000	Co-op Work Term IV	0.50
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**Summer Semester**

No academic semester or work term

**Semester 7 - Fall**

NUTR*4210	Nutrition, Exercise and Energy Metabolism	0.50
NUTR*4510	Toxicology, Nutrition and Food	0.50
1.50 electives or restricted electives		1.50

**Semester 8 - Winter**

2.50 electives or restricted electives		2.50
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**Restricted Electives**

1. A minimum of 2.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: <https://www.uoguelph.ca/bsc/>
2. 1.00 credits from the following:

Code	Title	Credits
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*4371	Research in Human Health and Nutritional Sciences I	0.50
HK*4372	Research in Human Health and Nutritional Sciences II	0.50
HK*4510	Teaching, Learning and Knowledge Transfer	1.00
HK*4511	Teaching, Learning & Knowledge Transfer I	0.50
HK*4512	Teaching, Learning & Knowledge Transfer II.	0.50
HK*4460	Regulation of Human Metabolism	0.50
NUTR*4360	Current Issues in Nutrigenomics	0.50
PATH*3610	Principles of Disease	0.50

HK*2810	Human Physiology I - Concepts and Principles	0.50
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ZOO*3600	Comparative Animal Physiology I	0.50
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Select 2.00 credits from the following:

ANSC*3170	Nutrition of Fish and Crustacea	0.50
ANSC*3180	Wildlife Nutrition	0.50
ANSC*4260	Beef Cattle Nutrition	0.50
ANSC*4270	Dairy Cattle Nutrition	0.50
ANSC*4280	Poultry Nutrition	0.50
ANSC*4290	Swine Nutrition	0.50
ANSC*4560	Pet Nutrition	0.50
EQN*4020	Advanced Equine Nutrition	0.50
FOOD*2010	Principles of Food Science	0.50
HK*3810	Human Physiology II - Integrated Systems	0.75
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*4510	Teaching, Learning and Knowledge Transfer	1.00
HK*4512	Teaching, Learning & Knowledge Transfer II.	0.50
NUTR*2150	Introduction to Nutritional and Food Sciences	0.50
NUTR*3360	Lifestyle Genomics	0.50
NUTR*3390	Applied Nutritional and Nutraceutical Sciences I	0.75
NUTR*4210	Nutrition, Exercise and Energy Metabolism	0.50
NUTR*4320	Nutrition and Metabolic Control of Disease	0.50
NUTR*4330	Applied Nutritional and Nutraceutical Sciences II	0.75
NUTR*4360	Current Issues in Nutrigenomics	0.50
NUTR*4510	Toxicology, Nutrition and Food	0.50

**Minor Requirements (Honours)**

This minor cannot be combined with a major in Nutritional and Nutraceutical Sciences.

A minor in Nutritional and Nutraceutical Sciences requires 5.00 credits as follows:

Code	Title	Credits
BIOC*2580	Introduction to Biochemistry	0.50
NUTR*3210	Fundamentals of Nutrition	0.50
NUTR*3330	Micronutrients, Phytochemicals and Health	0.50
NUTR*4090	Functional Foods and Nutraceuticals	0.50
STAT*2040	Statistics I	0.50
Select at least 0.50 credits from the following:		
ANSC*3080	Agricultural Animal Physiology	0.50
BIOM*3200	Biomedical Physiology	1.00