

# HUMAN HEALTH AND NUTRITIONAL SCIENCES

The Human Health and Nutritional Sciences Graduate Program offers MSc degrees by thesis, MSc degrees by course work and project, and PhD degrees. The three fields are listed below.

- **Biomechanics**
- **Nutrition, Exercise and Metabolism**
- **Nutritional and Nutraceutical Sciences**

See the department website (<http://www.uoguelph.ca/hhns/Graduate/Graduate.html>) for additional information.

## Administrative Staff

### Chair

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### Associate Chair

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### Assistant Graduate Program Coordinator for MSc by Coursework and Project Program

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### CBS Graduate Admissions Secretary

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## Graduate Faculty

*This list may include Regular Graduate Faculty, Associated Graduate Faculty and/or Graduate Faculty from other universities.*

### Marica Bakovic

B.Sc., M.Sc. Belgrade, PhD Alberta - Professor  
Graduate Faculty

### Leah Bent

B.Sc., M.Sc. Guelph, PhD British Columbia - Associate Professor  
Graduate Faculty

### William J. Bettger

BS, PhD Missouri - Associate Professor  
Graduate Faculty

### Stephen H. M. Brown

BHK, MHK Windsor, PhD Waterloo - Associate Professor  
Graduate Faculty

### Jamie Burr

BA Western, M.Sc., PhD York - Associate Professor  
Graduate Faculty

### Alison M. Duncan

B.A.Sc. Guelph, M.Sc. Toronto, PhD Minnesota - Professor

### Graduate Faculty

#### David J. Dyck

B.Sc., M.Sc., PhD Guelph - Professor  
Graduate Faculty

#### Mazyar Fallah

BA John Hopkins, MA, PhD Princeton - Professor and Dean, College of Biological Sciences

#### Graham P. Holloway

BA McMaster, M.Sc. Waterloo, PhD Guelph - Associate Professor  
Graduate Faculty

#### Lorraine C. Jadeski

B.Sc. Guelph, M.Sc. Waterloo, PhD Western - Associate Professor  
Graduate Faculty

#### David W. L. Ma

B.Sc., PhD Alberta - Professor  
Graduate Faculty

#### Michael McBurney

B.Sc. Carleton, M.Sc., PhD Cornell - Nutrition Consultant  
Associated Graduate Faculty

#### Philip J. Millar

B.Sc., M.Sc., PhD McMaster - Assistant Professor  
Graduate Faculty

#### Jennifer M. Monk

B.Sc., PhD Guelph - Assistant Professor  
Graduate Faculty

#### Coral L. Murrant

B.Sc., PhD Guelph - Professor and Chair  
Graduate Faculty

#### David M. Mutch

B.Sc. Queen's, PhD Lausanne - Associate Professor  
Graduate Faculty

#### Genevieve S. Newton

B.Sc. Laurentian, DC Chicago, M.Sc., PhD Guelph - Scientific Director, FRINGE, Online Education for Medical Professionals  
Associated Graduate Faculty

#### Geoffrey A. Power

BKin, M.Sc. Memorial, PhD Western - Associate Professor  
Graduate Faculty

#### Dan Ramdath

B.Sc. Toronto, M.Sc., PhD West Indies - Manager/Clinical Research Scientist (Human Nutrition), Guelph Food Research Centre, Agriculture and Agri-Food Canada  
Associated Graduate Faculty

#### Kerry L. Ritchie

B.Sc., PhD Guelph - Associate Professor  
Graduate Faculty

#### Lindsay E. Robinson

B.Sc. Acadia, PhD Alberta - Associate Professor  
Graduate Faculty

#### Jeremy A. Simpson

B.Sc., Guelph, PhD Queen's - Associate Professor  
Graduate Faculty

**Lawrence L. Spriet**

B.Sc. Waterloo, M.Sc. York, PhD McMaster - Professor  
Graduate Faculty

**John Z. Srbely**

B.Sc. Laurentian, DC Canadian Memorial Chiropractic College, PhD  
Guelph - Associate Professor  
Graduate Faculty

**Luc van Loon**

M.Sc., PhD Maastricht - Professor, Maastricht University  
Associated Graduate Faculty

**Amanda J. Wright**

B.Sc., PhD Guelph - Associate Professor  
Graduate Faculty

**David C. Wright**

BPE Calgary, M.Sc. Arizona State, PhD Ball State - Professor  
Graduate Faculty

**John L. Zettel**

BS Waterloo, M.Sc., PhD Toronto - Associate Professor  
Graduate Faculty

## MSc Program

The MSc program is offered in:

1. biomechanics
2. nutrition, exercise and metabolism
3. nutritional and nutraceutical sciences

The focus is on physical activity and diet as powerful lifestyle determinants of human health. The interaction between genetics and environmental factors determines human health and lifestyle is a major component of our environment.

Our graduate programs offer advanced experiential learning experiences in the broad areas of nutritional and nutraceutical sciences, general and exercise physiology and biomechanics within the focus of lifestyle, genetics and human health. Within these broad fields, the Department of Human Health and Nutritional Sciences addresses the issues at the level of the individual, not community or populations. The research efforts are focused on understanding the basic underlying biological aspects of health, which are further applied to understanding aging, neurological/sensory disorders and osteoarthritis, and chronic diseases such as cancer, cardiovascular disease, obesity, and type II diabetes

The Department offers programs of study leading to an MSc by thesis and an MSc by coursework and project. Within the MSc thesis program students must complete a minimum of 1.5 graduate credits and defend an acceptable thesis which comprises an account of the student's research. Within the MSc coursework program students must complete a minimum of 4.0 graduate credits which include credits for research experience.

### Admission Requirements

To be considered, applicants must meet the requirements of a four-year honours science degree with a minimum 75% average during the final two years or 4 semesters of undergraduate study. Applicants should have

completed a course in statistics. Each applicant must obtain the support of a faculty member willing to serve as their advisor.

Admission may be granted in September, January or May. Completed applications should be uploaded at least one full semester (four months) before the expected date of admission. Applications from international students should be uploaded at least eight months prior to the expected date of admission.

All components of the application, including transcript(s), graduate certificate(s), grading scale(s), language test results, assessment forms, a statement of interest and the name of the faculty advisor must be uploaded no later than two months after an application is submitted through the OUAC portal. Applications that are incomplete after this time period will be closed.

### Admission Process

Graduate student applications to programs in the College of Biological Science are handled by the Office of the Associate Dean, Research (ADR). Before submitting an application, applicants are strongly encouraged to review the information found on the CBS-ADR website to learn more about the application process (<https://www.uoguelph.ca/cbs/academics/graduate/programs/>).

Complete application submission instructions may also be found on the Office of Graduate Studies (<https://graduatestudies.uoguelph.ca/future/applying-guelph/>) webpage or in the Graduate Calendar ([calendar.uoguelph.ca/graduate-calendar/general-regulations/admission/application-admission/](http://calendar.uoguelph.ca/graduate-calendar/general-regulations/admission/application-admission/)).

### Program Requirements

Students enrol in one of two study options:

1. thesis
2. course work and major research project.

#### Thesis

Students must complete and defend an acceptable thesis which comprises a scientifically defensible account of the student's research on a particular, well-defined research problem or hypothesis. Such research should begin with the practical expectation that it could be completed and the thesis defended in not more than 5 semesters. Paramount to the notion of acceptability of the thesis is its quality with respect to problem identification, the approach used to address the problem, and the evaluation of the results.

In addition they must successfully complete courses totaling not fewer than 1.5 graduate credits. The graduate credits of course work will consist of:

- a. at least one of:

Code	Title	Credits
HHNS*6040	Research Fronts in Nutritional and Nutraceutical Sciences	0.50
HHNS*6500	Cardiovascular and Respiratory Physiology	0.50
HHNS*6700	Nutrition, Exercise and Metabolism	0.50
HHNS*6800	Research Frontiers in Integrative Biomechanics and Neurophysiology	0.50

- b. at least 1.0 credits of electives as determined with the Advisory Committee

### Course Work and Major Research Project (MRP)

Students must complete at least 4.0 graduate credits as follows:

Code	Title	Credits
HHNS*6010	Seminar in Human Health and Nutritional Sciences	0.50
HHNS*6320	Advances in Human Health and Nutritional Sciences Research	0.50
Select at least one of the following:		
HHNS*6910	Basic Research Techniques and Processes	0.50
HHNS*6920	Applied Research Techniques and Processes	0.50
HHNS*6930	Research Project	0.50
Select at least one of the following:		
HHNS*6040	Research Fronts in Nutritional and Nutraceutical Sciences	0.50
HHNS*6500	Cardiovascular and Respiratory Physiology	0.50
HHNS*6700	Nutrition, Exercise and Metabolism	0.50
HHNS*6800	Research Frontiers in Integrative Biomechanics and Neurophysiology	0.50
Select at least 1.0 to 2.0 graduate credits of electives		1.0-2.0

## PhD Program

The PhD program is offered in:

1. biomechanics;
2. nutrition, exercise and metabolism; and
3. nutritional and nutraceutical sciences.

The focus is on physical activity and diet as powerful lifestyle determinants of human health. The interaction between genetics and environmental factors determines human health and lifestyle is a major component of our environment.

Our graduate programs offer advanced experiential learning experiences in the broad areas of nutritional and nutraceutical sciences, general and exercise physiology and biomechanics within the focus of lifestyle, genetics and human health. Within these broad fields, the Department of Human Health and Nutritional Sciences addresses the issues at the level of the individual, not community or populations. The research efforts are focused on understanding the basic underlying biological aspects of health, which are further applied to understanding aging, neurological/sensory disorders and osteoarthritis, and chronic diseases such as cancer, cardiovascular disease, obesity, and type II diabetes.

### Admission Requirements

Applicants must have a recognized Master's degree in a related field obtained with a minimum academic standing of 80% in their postgraduate studies, and the endorsement of a potential thesis advisor. Applicants should have completed a course in statistics. Under exceptional circumstances admission directly to a PhD program with an appropriate honours degree alone, or transfer from MSc to PhD program without completing the MSc thesis requirements, is also possible.

Admission may be granted in September, January or May. Completed applications should be uploaded at least one full semester (four months) before the expected date of admission. Applications from international students should be uploaded at least eight months prior to the expected date of admission.

Each applicant must obtain the support of a faculty member willing to serve as their advisor.

All components of the application, including transcript(s), graduate certificate(s), grading scale(s), language test results, assessment forms, a statement of interest and the name of the faculty advisor must be uploaded no later than two months after an application is submitted through the OUAC portal. Applications that are incomplete after this time period will be closed.

### Admission Process

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Complete application instructions may also be found on the Office of Graduate Studies (<http://www.uoguelph.ca/graduatestudies/apply/>) webpage or in the Graduate Calendar (<calendar.uoguelph.ca/graduate-calendar/general-regulations/admission/application-admission/>).

### Program Requirements

The major part of a student's time will be devoted to research in fulfilment of the dissertation requirement. Course work would be established through discussion with the student's Advisory Committee.

PhD students will become candidates for the PhD degree upon completion of a qualifying examination, which must be conducted not later than the fifth semester of the PhD program. The examination will be primarily research focused.

### Thesis Requirements

Submission and defence of an acceptable dissertation complete the requirements for a PhD. An acceptable dissertation comprises a report of the candidate's research on a particular and well-defined research problem or hypothesis. It should represent a significant contribution to knowledge in that field. Emphasis is placed on the quality of the work judged by the expression of mature scholarship and critical judgment in the dissertation. Dissertation approval implies that it could be published in reputable, refereed journals in its field.

## Interdepartmental Programs

Students may wish to participate in the interdepartmental programs in Bioinformatics (<calendar.uoguelph.ca/graduate-calendar/graduate-programs/bioinformatics/>) or Biophysics (<calendar.uoguelph.ca/graduate-calendar/graduate-programs/biophysics/>).

## Collaborative Specializations

Students may wish to participate in the collaborative specializations in One Health, Neuroscience (<calendar.uoguelph.ca/graduate-calendar/collaborative-specializations/neuroscience/>), Regenerative Medicine (<calendar.uoguelph.ca/graduate-calendar/graduate-programs/human-health-nutritional-sciences/graduate-calendar/collaborative-specializations/regenerative-medicine/>) or Toxicology (<calendar.uoguelph.ca/graduate-calendar/collaborative-specializations/toxicology/>).

## Courses

### HHNS\*6000 Students Promoting Awareness of Research Knowledge Summer, Fall, and Winter [0.25]

This course will explore research communication through practical experience. The course will be part of the SPARK program in which students write, edit and coordinate a variety of news publications that highlight University of Guelph research activities for a wide range of audiences.

**Restriction(s):** Restricted to HHNS MSc coursework/MRP students.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

### HHNS\*6010 Seminar in Human Health and Nutritional Sciences Summer Only [0.50]

Students will develop their scientific communication skills by translating a specific body of knowledge on a chosen topic into a seminar. The class will also explore scientific process-oriented concepts and issues such as effective scientific communication and dissemination of results.

**Restriction(s):** Restricted to HHNS MSc coursework/MRP students.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

### HHNS\*6040 Research Fronts in Nutritional and Nutraceutical Sciences Fall Only [0.50]

Building on an information base in nutrition, biochemistry and physiology, the course comprises selected research topics pertaining to the importance of nutrition as a determinant of health throughout the life span. Distinction will be drawn between the metabolic basis of nutrient essentiality and the health protectant effects of nutraceuticals.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

### HHNS\*6130 Advanced Skeletal Muscle Metabolism in Humans Winter Only [0.50]

This course examines how the energy provision pathways in human skeletal muscle and associated organs meet the energy demands of the muscle cell during a variety of metabolically demanding situations.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

### HHNS\*6320 Advances in Human Health and Nutritional Sciences Research Summer, Fall, and Winter [0.50]

This course provides the student with an opportunity to study a topic of choice and involves literature research on a chosen topic. The course may stand alone (MSc thesis and PhD students) or provide the background information for an experimental approach to the topic (MSc course work and project students).

**Restriction(s):** Instructor consent required.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

### HHNS\*6400 Functional Foods and Nutraceuticals Fall Only [0.50]

This course considers the relation of nutraceuticals, functional foods, designer foods, medical foods and food additives to foods and drugs. The course emphasizes the development and commercialization of nutraceuticals.

**Restriction(s):** Restricted to Human Health & Nutritional Sciences students.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

### HHNS\*6410 Applied Functional Foods and Nutraceuticals Winter Only [1.00]

This course prepares students to develop an innovative product or service from conceptualization to market entry considering regulatory, product development, safety/efficacy and market readiness issues. The course applies and integrates the concepts defined in HHNS\*6400

**Prerequisite(s):** HHNS\*6400 - Minimum grade 065.

**Restriction(s):** Restricted to Human Health & Nutritional Sciences students.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

### HHNS\*6440 Nutrition, Gene Expression and Cell Signalling Winter Only [0.50]

This course emphasizes the role nutrients play as modulators of gene expression at the molecular level. The mechanisms by which nutrients modulate gene expression through specific cell signalling cascades are examined. (offered annually)

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

### HHNS\*6500 Cardiovascular and Respiratory Physiology Fall Only [0.50]

This course will use both review articles and the primary literature to build a broad base of understanding of the cardiovascular and respiratory systems as well as explore current research in specific areas in this knowledge paradigm. Further, this course will build research skills through by strengthening critical analysis skills and both oral and written communication skills through learning about the cardiovascular and respiratory system and how they integrate.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

### HHNS\*6700 Nutrition, Exercise and Metabolism Fall Only [0.50]

A discussion of recent concepts in the relationships among nutrition, exercise and metabolism. Information from the molecular to the whole-body level will be presented with a focus on understanding nutrition and exercise in the human. Emphasis is placed on the development and testing of experimental hypotheses in these areas of research.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

### HHNS\*6710 Advanced Topics in Nutrition and Exercise Fall Only [0.50]

Advanced topics will be presented to establish an in-depth understanding of current investigations in nutrition and exercise. Based on the integrated understanding of nutrition and exercise developed in HHNS\*6700, the focus of this course will be to develop the student's ability to independently analyze original research investigations.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

### HHNS\*6800 Research Frontiers in Integrative Biomechanics and Neurophysiology Fall Only [0.50]

This course will provide students with a breadth of knowledge and understanding across the research frontiers pursued by the integrative biomechanics and neurophysiology group. Students will be given opportunity to practice and improve oral and written communication skills and provide constructive feedback to their peers. Additionally, this class will engage students in dialogue around topics pertinent to designing and conducting successful experiments such as hypothesis generation and ethical and practical considerations.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HHNS\*6810 Research Methods in Integrative Biomechanics and Neurophysiology I Fall Only [0.50]**

This course develops a comprehensive understanding of methods and analysis related to research in biomechanics & neuroscience. Critical evaluation and application of basic signal to noise processing and electromyography is a priority. The course uses labs, assignments, and critical review of primary literature articles to develop a strong research foundation. Scientific writing and oral communication skills are emphasized via written reports and presentations, and numeracy throughout the course in data and lab assignments.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HHNS\*6820 Research Methods in Integrative Biomechanics and Neurophysiology II Winter Only [0.50]**

This course develops a comprehensive understanding of methods and analysis related to research in biomechanics & neuroscience. Critical evaluation and application of 3D kinematics and programming/modelling is a priority. The course uses labs, assignments, and critical review of primary literature articles to develop a strong research foundation. Scientific writing and oral communication skills are emphasized via written reports and presentations, and numeracy throughout the course in data and lab assignments.

**Prerequisite(s):** HHNS\*6810

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HHNS\*6910 Basic Research Techniques and Processes Summer, Fall, and Winter [0.50]**

Working with a faculty advisor, students will gain experience in basic aspects of scientific research. This will be accomplished through experience of one or more components of the scientific method in a laboratory setting. Objective outcomes will be evaluated and will include documentation of the experience in a written report.

**Restriction(s):** Restricted to HHNS MSc coursework/project students.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HHNS\*6920 Applied Research Techniques and Processes Summer, Fall, and Winter [0.50]**

Under the supervision of a faculty advisor, students will gain practical experience in discipline-specific aspects of research. This will be accomplished through experience in a pre-arranged practicum in an applied setting. Objective outcomes will be evaluated and will include documentation of the experience in a written report.

**Restriction(s):** Restricted to HHNS MSc coursework/MRP students.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HHNS\*6930 Research Project Summer, Fall, and Winter [0.50]**

Under the supervision of a faculty advisor and building on knowledge gained from Basic or Applied Research Techniques and Processes, students will carry out a specific research project to its completion. Results will be documented in a written report and communicated through a scientific poster.

**Prerequisite(s):** HHNS\*6910 or HHNS\*6920

**Restriction(s):** Restricted to HHNS MSc coursework/MRP students.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph