



NUTR*3390 Applied Nutritional and Nutraceutical Sciences I

Fall 2022
Section(s): C01

Department of Human Health and Nutritional Sciences
Credit Weight: 0.75
Version 1.00 - September 02, 2022

1 Course Details

1.1 Calendar Description

This course will introduce and develop key concepts of the applied aspects of the Nutritional and Nutraceutical Sciences. Enrichment of foods with health protectant chemicals, establishing biomarkers and risk indicators of disease, testing of bioavailability/efficacy to support basic health claims, health assessment and nutrigenomic analysis as adjuvants in the effective use of functional foods and nutraceuticals, and regulatory and marketing/consumer issues are topics that will be addressed.

Pre-Requisites: NUTR*3210
Restrictions: Registration in the BSC.NANS major or minor and the BSC.FFAN minor.

1.2 Course Description

The course is designed to explore, and provide experiential learning opportunities in, the two major areas of Nutritional and Nutraceutical Sciences - product formulation/development and product testing of safety, efficacy and effectiveness. The course also focuses on the analytical techniques which support these areas.

1.3 Timetable

Lecture Mon / Wed / Fri 10:30-11:20 MAC 149

Lab 1 Tues. 2:30 - 5:20 FS 146

Lab 2

Wed. 1:30 - 4:20

FS 146

1.4 Final Exam

None

2 Instructional Support

2.1 Instructional Support

Instructor: Dr. W.J. Bettger (wbettger@uoguelph.ca)

Teaching Assistants: Gia Shelp MSc candidate (gshelp@uoguelph.ca)

Rachel Von Holt MSc candidate (rvonholt@uoguelph.ca)

Office Hours: by appointment (e-mail)

3 Learning Resources

3.1 Resources

No textbook required.

4 Learning Outcomes

4.1 Learning Outcomes

Learning Outcomes of NUTR*3390

A. General Skills

1. Problem Solving & Critical Thinking

- Critically evaluate ideas and arguments by gathering and integrating relevant information, assessing its credibility, and synthesizing evidence to formulate a position.
- Identify problems and independently propose solutions using creative approaches, acquired through interdisciplinary experiences, and a depth and breadth of knowledge/expertise.

2. Communication

- Accurately and effectively communicate ideas, arguments and analyses, to a range of audiences, in graphic, oral and written form.

3. Professional and Ethical Behaviour

- Demonstrate personal and professional integrity by respectfully considering diverse points of view and the intellectual contribution of others, and by demonstrating a commitment to honesty and equity, and awareness of sustainability, in scientific practice and society at large.
- Collaborate effectively as part of a team by demonstrating mutual respect, leadership, and an ability to set goals and manage tasks and timelines.
- Plan for professional growth and personal development within and beyond the undergraduate program.

B. Degree Related Skills & Knowledge

1. Scientific Method

- Apply scientific methods and processes by formulating questions, designing investigations and synthesizing data to draw conclusions and make scientifically-

based decisions.

2. Breadth & Depth of Understanding in a Particular Scientific Discipline

- Apply the core concepts of math, physics, chemistry and biology to Nutritional and Nutraceutical Sciences.
- Demonstrate knowledge of the ethical, economic, commercial and social implications of scientific discovery and technological innovation.
- Interpret current scientific concepts and gaps in knowledge (and methods) in light of the historical development of the discipline of Nutritional and Nutraceutical Sciences.
- Apply an integrated and broad foundation in life sciences to problems related to human nutrition, nutri-pharmacology, nutri-toxicology and health.
- Demonstrate knowledge of the impact of human nutrition, nutri-pharmacology and nutri-toxicology on health and performance, and provide mechanistic explanations for associated biological events at the molecular, cellular and whole organism levels of organization.
- Demonstrate an understanding of the science of prospective health; the pivotal role of individual nutrigenomic and nutri-epigenetic analyses and the critical role of evidence-based, lifestyle medicine in the effective application of this prospective health approach to healthcare.
- Define and analyze the interactions of nutrition and exercise on the metabolic control of health and disease.

3. Scientific Technology & Techniques in a Scientific Discipline

- Critically analyze experimental design, data analysis and interpretation in human nutrition, nutri-pharmacology and nutri-toxicology research.
- Demonstrate proficiency in the formulation and development of a functional food or nutraceutical product.
- Design, analyze and interpret results from a human clinical trial using a functional food or nutraceutical as the experimental intervention.

Upon completion of this course, a student will be able to:

- apply the integrated knowledge of their University degree and write both a formal essay and an (public domain) editorial on a topic relevant to Nutritional and Nutraceutical Sciences.

-critically analyze published research on a randomized controlled human clinical trial and subsequently, design, present and orally defend a follow-up experiment.

- work effectively as a workplace-relevant team to conceptualize, design, prototype, and present (public exposition) a functional food or nutraceutical product. The product exposition will also include creation and presentation of the product packaging and a marketing strategy.

- apply their knowledge and understanding of Nutritional and Nutraceutical Sciences career pathways to develop a personal and professional development plan for the remainder of their university undergraduate degree program.

5 Teaching and Learning Activities

5.1 Activities

Mondays-- Discussions/Demonstrations/Case Studies: Week 1 to Week 12 - Special Topics in FFN Product Design and Development

Wednesdays and Fridays -- Discussions/Demonstrations/Case Studies: Week 1 to Week 12 – Special Topics in Product Testing for Safety, Efficacy and Effectiveness

Lab Schedule: Week 1 - 4 Skills and Attributes of Career Development / Consultations for the Major Projects

Week 5 - 6 Human Nutrition/Natural Health Product Studies

Week 7 - 8 Sensory Analysis

Week 9 - 10 Regulatory Affairs

Week 11 - Health Assessment and Diagnostics
12

6 Assessments

6.1 Marking Schemes & Distributions

Course Evaluation:

Students will be evaluated in the course based on their performance on three major projects, a series of self-reflections and a final integrating writing assignment. Project #1 is the development of a functional food or cosmeceutical product along with an effective delivery system (for details see handout #1). Project #2 is a Power Point-based 15 minute oral presentation on the testing of a functional food, nutraceutical or cosmeceutical product for safety, efficacy or effectiveness (for details see handout #2). Project #3 is an opinion/editorial article written about a current issue in nutritional and nutraceutical sciences (see handout #3 for details). Written, guided Self- Reflections will be focused on professional development and career planning and will be extensions of the laboratory exercises and activities. The final, Integrating Writing Assignment in the course, which will be in the form of short answer/short essay, will extend lecture and lab material and will be a take home assignment (see handout #4 for details). The weighting of the marks will be Project #1, 40%, Project #2, 20%, Project #3, 20%, Self-Reflections, 10% and the Integrating Writing Assignment, 10%.

Schedule of Assignments and Evaluations (link to Learning Outcomes)

Project #1 Group Product Development Project - Wed. Nov. 23 (A1,2,3,B1,2,3)

Project #2 Power Point-based Oral Presentation - Mon. Nov. 7 (A1,2,B1,2,3)

Project #3 Editorial Article- First Submission - Wed. Oct. 12, Second Submission (revised after edits) - Wed. Nov. 3

(A1,2,3, B1,2)

Self-Reflections on Professional Development - Fri. Sept. 30, Fri. Oct. 28 and Fri. Nov. 25
(A1,A2,B2)

Final Integrating Writing Assignment - Wed. Nov. 30 (A1,2,3,B1,2,3)

7 Department of Human Health and Nutritional Sciences Statements

7.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. [B.Sc. Academic Advising](#) or [Program Counsellors](#)

7.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist. <http://www.learningcommons.uoguelph.ca/>
- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: <http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help> and <http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help>

7.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance.

<https://www.uoguelph.ca/counselling/>

- Student Health Services is located on campus and is available to provide medical attention. <https://www.uoguelph.ca/studenthealthservices/clinic>
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations. <http://www.selfregulationskills.ca/>

7.4 Personal information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) <http://www.e-laws.gov.on.ca/index.html>. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes.

For more information regarding the Collection, Use and Disclosure of Personal Information policies please see the Undergraduate Calendar. (<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml>)

7.5 Course Offering Information Disclaimer

Please note that course delivery format (face-to-face vs online) is subject to change up to the first-class day depending on requirements placed on the University and its employees by public health bodies, and local, provincial and federal governments. Any changes to course format prior to the first class will be posted on WebAdvisor/Student Planning as they become available.

8 University Statements

8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions
<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

8.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes
<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses
<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

For Guelph students, information can be found on the SAS website
<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website
<https://www.ridgetownc.com/services/accessibilityservices.cfm>

8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

8.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>

8.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such

changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

8.10 Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

8.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campusess/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campusess/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.
