

**CARLETON UNIVERSITY COMMITTEE ON
QUALITY ASSURANCE**

**Cyclical Review of the undergraduate program in Food Science and Nutrition
Executive Summary and Final Assessment Report**

This Executive Summary and Final Assessment Report of the cyclical review of Carleton's undergraduate program in Food Science and Nutrition are provided pursuant to the Quality Assurance Framework and Carleton's Institutional Quality Assurance Process (IQAP).

EXECUTIVE SUMMARY

The undergraduate program (B.Sc.) in Food Science and Nutrition is hosted by the Department of Chemistry, a unit administered by the Faculty of Science.

As a consequence of the review, the program was categorised by the Carleton University Committee on Quality Assurance (CUCQA) as being of **GOOD QUALITY** (Carleton's IQAP 7.2.12).

The External Reviewers' report, submitted to the Department of Chemistry on April 6th, 2016, offered a very positive assessment of the program. Within the context of this positive assessment, the report nonetheless made a number of recommendations for the continuing enhancement of the program. These recommendations were productively addressed by Instructors in the Food Science and Nutrition program, the Chair of the Department of Chemistry and the Dean of Science in a response to the External Reviewers' report that was submitted to CUCQA on August 10th, 2016.

An Action Plan detailing how, when and by whom the recommendations will be implemented was received and approved by CUCQA on October 11th, 2017.

DATE: July 21st, 2017

TO: Dr. Lorraine Dyke, Vice-Provost and Associate Vice-President (Academic)

FROM: Dr. Véronic Bézaire, Food Science and Nutrition CPR Chair, Department of Chemistry
Dr. Tyler Avis, Food Science and Nutrition CPR Interim Chair, Department of Chemistry
Dr. Robert Crutchley, Chair, Department of Chemistry

RE: Action Plan for the CPR of the Undergraduate Food Science and Nutrition Program

The Food Science and Nutrition Program from the Department of Chemistry would like to thank the Carleton University Committee on Quality Assurance and External Reviewers for their feedback, comments, and recommendations in improving our Program. We believe the action plan below will convince you of our dedication to implementing your recommendations and improving our Program.

1. Provision must be made to ensure individual honours projects are appropriately mentored without compromising project quality. Group projects should not be considered a viable solution to increase enrollment.

ACTION: The hiring of three Faculty members is needed to ensure quality of Honours projects in themes that are aligned with our program vision. The first faculty member will be hired at the Assistant Professor rank (**Hire #1** in Table) and have expertise in food toxicology. The second faculty member will be hired at the Assistant Professor or Instructor rank (**Hire #2** in Table) and have extensive (10 years +) experience in the food industry. The third faculty member will be hired as an Instructor (**Hire #3**; shared with FPA) and will have expertise in food law and regulation. All three hires will contribute to supervisory duties of Honours theses (laboratory- and literature-based) in areas that are essential to our program's uniqueness.

We will also introduce a Major CGPA minimum criterion of 8.0 (out of 12.0) for Honours projects. Students who do not meet the CGPA criterion will be directed to a new capstone course (FOOD 4905 Honours Workshop), modeled after an existing BIOL course. FOOD 4905 Honours Workshop will be a 1.0 credit course lead by a single instructor for groups of up to 10 students. Learning outcomes for this course will be consistent with Honours courses.

2. Where areas of course material duplication are identified as being non-productive by academic staff consultation, corrective action should be undertaken.

ACTION: Group course revisions took place this summer (Jun-Jul 2017) for the third consecutive year, in the shape of workshops with experts in course design from Carleton's Educational Development Centre. The objective is to formulate course-level learning outcomes, eliminate redundant material, ensure appropriate complexity of material, and alignment of assignments. This exercise once again required in-depth consultation between the Program Faculty members. Courses successfully revised so far are: FOOD 2001, 3001, 3002, 3003, 2002/3004, 3005. The review of the remaining FOOD courses and new FOOD courses will be completed over the next two years.

3. Where the amount/nature/complexity of course material is considered inadequate, again by staff consultation, action should be taken to correct the situation. Resolution of this issue should occur before the implementation of subject streams in the program.

ACTION: Same as recommendation #2. With regards to timing and implementation of subject streams, new courses suggested by Reviewers and Program Faculty have been approved for the 2017-18 academic year. However new advanced courses will not be offered until the review of existing FOOD courses is completed and resources are available. Developing subject streams will follow, if appropriate, a few years later.

4. Provision should be made to include at least one (possibly two) courses on oral and written communications skills.

ACTION: We completely agree with this recommendation. A new core introductory-level course (2000-level) in scientific writing has been approved for 2017-18 academic year. Effort will be placed in reinforcing scientific writing skills in 3000-level lectures and labs to yield significant improvement at the 4000-level.

5. A course on critical thinking and professional ethics should be considered.

ACTION: We believe that elements of critical thinking and professional ethics should be incorporated in a number of 4000-level courses and presented from different perspectives to further reinforce these notions. Therefore, instead of creating a new course on critical thinking and professional ethics, these concepts will be added as learning objectives in FOOD 4001, FOOD 4102, and FOOD 4103. For both critical thinking and professional ethics, emphasis will be placed on understanding uncertainties in the information available to food regulators and the responsibilities associated with decision-making.

6. Emphasis should continue to be placed upon development of laboratory section scheduling in such a manner that the laboratory co-ordinator is not overworked and the laboratories are not overcrowded. When opportunity occurs, acquisition of laboratory space should take place.

ACTION: In response to this recommendation, the maximum number of students per lab section in the food teaching lab space has already been reduced from 12 to 8 students, effective September 2017. This will reduce congestion in FOOD 3001, FOOD 3002, and FOOD 3005. This will obviously result in more lab sections for a given course. However, multiple sections for a given course will be offered successively to minimize the laboratory coordinator's set up and tear down time necessary with different courses.

To further alleviate the load on the laboratory coordinator, we will attempt to maintain the maximum number of lab sections per coordinator, per term, in line with other units in the Faculty of Science. To meet this requirement, another laboratory coordinator with knowledge in microbiology AND chemistry may be required.

With regards to space, optimization of the food teaching laboratory space may reduce the need for additional space. This will be attempted before requesting additional space.

7. Consideration should be given to the development of a module or a course at the 2000 level on food processing or food plant operations to enable better student understanding of the course on Food Engineering.

ACTION: An introductory level course (2000-level) in food processing has been approved for the 2017-18 academic year. This course will be a logical building block for the suite of core FOOD courses offered at the 3000-level. A specific set of learning outcomes has been formulated for food processing. Some basic concepts of food processing are currently included in FOOD 3004 (Food Engineering). Therefore, learning outcomes and course content for FOOD 3004 will be revised to ensure that lecture material and skills build upon those presented in the new food processing course.

8. Work should continue on development of learning outcomes to a level where it can competently predict that courses are being efficiently delivered and are effective in achieving desired outcomes. Academic staff should develop mechanisms to monitor, with proper evidence, that the students are acquiring these specific learning outcomes.

ACTION: We have been assessing program learning outcomes for the past four years. In fact, as of this summer, all twelve program learning outcomes have been assessed at least once. In a joint effort with the Office of Quality Assurance, we tested different assessment approaches. I believe that we have finally developed a true culture of assessment, with proper evidence, modes of storage, and evaluation. At our last 'Assessment Day Retreat', we finally had genuine and constructive conversations about what students know/do not know, what they can/cannot do, why, and how to modify courses and assignments to rectify the situation. As we embark on the second round of assessment for all twelve program learning outcomes, we will examine the impact of our own assessment. We will also aim to make the process more efficient.

9. Presently strong motivation for FSN program quality and improvement resides in the program core Instructor III position. It is unlikely that this energy and enthusiasm is sustainable in the longer term without further commitment from the Department of Chemistry.

ACTION: The Department of Chemistry's commitment to the FOOD program quality and improvement will be in the form of three future Faculty hires (Hires #1, #2, and #3 introduced in Q1 and described again below). Following the unsuccessful CRC recruitment, the Department of Chemistry requested the hiring of one Faculty member, at the Assistant Professor rank, in the area of food toxicology (Hire #1). This position is currently being advertised with a start date of January 2018. This Faculty member will expand research in food analysis and regulation, host Honours students, and teach existing or proposed courses related to food toxicology, risk assessment, and analysis of food contaminants.

The second faculty hire will have several years (10 or more) of experience in the food industry (Hire #2). The Instructor/Assistant Professor will teach the most applied courses in our program (food processing, food packaging, food engineering, and food quality control) and host Honours students. Our FOOD program will require an additional faculty member with a degree in Food Science should it decide to seek accreditation with the Institute of Food Technologists.

A third faculty hire will be an Instructor (joint with FPA) to teach two courses in food law and regulation (Hire #3). This will offer much-needed stability in the regulatory aspect of the program. This Instructor

will develop and teach regulatory courses to further strengthen this unique aspect of our program. The Instructor will also build our new co-op program with government agencies and food industries.

Altogether, these three new hires will allow for newly proposed courses to be taught. It will also result in a much-needed redistribution of the administrative load over a larger number of Faculty members.

Lastly, CUCQA would like us to address the issue of the word 'nutrition' in our program name in the current action plan. The external reviewers also raised this issue, but did not make a formal recommendation. The core Food Science and Nutrition faculty in consultation with the Department Chair will meet in the Fall 2017 to discuss options and consequences of maintaining or changing the program name. We expect to discuss the following options:

1. Shortening program title to 'Food Science'
2. Changing program title to highlight its unique regulatory nature
3. Keeping program title as 'Food Science and Nutrition'
4. Keeping program title as 'Food Science and Nutrition' with creation of more nutrition courses

FOOD ACTION PLAN			
Recommendations	Actions	Individual/Committee	Timeline
1. Provision must be made to ensure individual honours projects are appropriately mentored without compromising project quality. Group projects should not be considered a viable solution to increase enrollment.	Hire one new faculty at assistant professor rank; expertise in food toxicology (Hire #1); will teach 1.5 cr in current and future courses and host Honours students In the meantime, request CI for 0.5 cr (FOOD 4103)	Faculty Dean Departmental Chair Hiring Committee	Closing date for applications: October 31 st 2017. Start date January 2018. CI – Approved for 2017-18;
	Hire one new faculty at assistant professor or instructor rank; expertise in food industry (Hire #2); will teach 1.5 to 3.0 cr in current and future courses and host Honours students In the meantime, request CI for 1.0 cr (FOOD 3003, 4001)	Faculty Dean Departmental Chair Hiring Committee	Discussions with Faculty Dean in Fall 2017. CI – Approved for 2017-18;
	Hire new faculty at Instructor rank (Hire #3); will teach 1.0 cr in current and future courses, host Honours students, and build co-op; In the meantime, request CI for 1.0 cr (FOOD 2003, 4102)	Faculty Dean Departmental Chair Hiring Committee	Discussions with Faculty Dean in 2018. CI – Approved for 2017-18;

FOOD ACTION PLAN			
Recommendations	Actions	Individual/Committee	Timeline
	<p>Introduce CGPA cutoff for 4907 and 4908 courses.</p> <p>Develop new 4905 Group Honours Workshop course for students below CGPA cutoff or other students who may prefer this option.</p> <p>Request CI for 1.0 cr</p>	<p>Departmental Chair CPR Chair Current FOOD instructor</p>	<p>Course approved for 2017-18 calendar. Available as an option in 2018-19. Effective for all students in 2020-21.</p> <p>CI needed for 2018-19</p>
<p>2. Where areas of course material duplication are identified as being non-productive by academic staff consultation, corrective action should be undertaken</p>	<p>Continue annual summer FOOD Faculty workshop with course design experts from EDC until all current and future FOOD courses have been revised</p>	<p>FOOD Faculty members FOOD Contract Instructors EDC staff</p>	<p>Summer 2017: FOOD 2001, 2004, 2003/4103 Summer 2018: FOOD 4102, 4201, 4203, 4002, 4301</p>
<p>3. Where the amount/nature/complexity of course material is considered inadequate, again by staff consultation, action should be taken to correct the situation. Resolution of this issue should occur before the</p>	<p>Same as point #2</p>	<p>Same as point #2</p>	<p>Same as point #2</p>

FOOD ACTION PLAN			
Recommendations	Actions	Individual/Committee	Timeline
implementation of subject streams in the program.			
4. Provision should be made to include at least one (possibly two) courses on oral and written communications skills.	<p>Develop mandatory 2000-level Scientific Writing Course</p> <p>Hire one new faculty at assistant professor or instructor rank; expertise in food industry (Hire #2); will teach 1.5 to 3.0 cr in current and future courses; will permit redistribution of teaching load among Faculty</p>	<p>CPR Chair Current FOOD Instructor</p>	<p>Course approved for 2017-18 calendar; syllabus developed in summer 2017</p> <p>Discussions with Faculty Dean in Fall 2017.</p>
5. A course on critical thinking and professional ethics should be considered.	Add learning outcomes associated with critical thinking and professional ethics to FOOD 4001, 4102, and 4103	<p>FOOD Faculty members FOOD Contract Instructors EDC staff</p>	Summers 2017 and 2018, as per FOOD workshop schedule
6. Emphasis should continue to be placed upon development of laboratory section scheduling in such	Set maximum number of students per section to 8	<p>Departmental Chair FOOD lab Instructors FOOD lab Coordinator Peter Mosher</p>	Effective 2016-17; to be reviewed annually.

FOOD ACTION PLAN			
Recommendations	Actions	Individual/Committee	Timeline
a manner that the laboratory co-ordinator is not overworked and the laboratories are not overcrowded. When opportunity occurs, acquisition of laboratory space should take place.	Maintain number of lab sections per term per coordinator in line with other units Evaluate need for additional lab space and new laboratory coordinator with experience in microbiology and chemistry	Departmental Chair FOOD lab Instructors FOOD lab Coordinator Peter Mosher	Effective 2016-17. To be reviewed annually based on enrollment figures.
7. Consideration should be given to the development of a module or a course at the 2000 level on food processing or food plant operations to enable better student understanding of the course on Food Engineering.	Develop mandatory 2000-level Food Processing Course Hire one new faculty at assistant professor rank or instructor rank; expertise in food industry (Hire #2); ; will teach 1.5 to 3.0 cr in current and future courses; will permit redistribution of teaching load in the meantime, request CI for 0.5 cr	Faculty Dean Departmental Chair Hiring committee	Course approved for 2017-18 calendar; syllabus developed in summer 2017 Decision on new Instructor hire will be made in Fall 2017; CI – Approved for 2017-18;
8. Work should continue on development of learning outcomes to a level where it can competently predict that courses are being	Seek methods to improve assessment efficiency Assess impact of learning outcome assessment practices	CPR Chair FOOD Faculty members, Office of Quality Assurance, Office of Quality Initiatives	Fall 2017 Summer 2018

FOOD ACTION PLAN			
Recommendations	Actions	Individual/Committee	Timeline
efficiently delivered and are effective in achieving desired outcomes. Academic staff should develop mechanisms to monitor, with proper evidence, that the students are acquiring these specific learning outcomes.			
9. Presently strong motivation for FSN program quality and improvement resides in the program core instructor III position. It is unlikely that this energy and enthusiasm is sustainable in the longer term without further commitment from the Department of Chemistry.	Hire one new faculty at assistant professor rank; expertise in food toxicology (Hire #1)	Faculty Dean Departmental Chair Hiring Committee	Closing date for applications: October 31 st 2017. Start date January 2018.
	Hire one new faculty at assistant professor rank or instructor rank; expertise in food industry (Hire #2)	Faculty Dean Departmental Chair Hiring Committee	Discussions with Faculty Dean in Fall 2017.
	Hire one new faculty at instructor rank; expertise in food law and regulation; to be shared in FPA (Hire #3)	Faculty Deans (Science, Public Affairs) Departmental Chair Hiring Committee	Discussions with Faculty Deans in Fall 2018.
10. CUCQA: Concern expressed by the external reviewers regarding the lack of "Nutrition" content	Discussion on revision of program name	Departmental Chair FOOD faculty members	Fall 2017

FOOD ACTION PLAN			
Recommendations	Actions	Individual/Committee	Timeline
and the ensuing misalignment between the program and its title. Any proposed solution to remedy this discrepancy should be included in the Action Plan.			