



UPER Project – Final Report

Report Completion Date: (2021/07/30)

1. PROJECT OVERVIEW

1.1 General Information

Faculty/Department:	Faculty of Land and Food Systems; Food, Nutrition and Health		
Degree Program:	Food Science		
Project Title:	Food Science Undergraduate Program Renewal: Scaffolding Student Learning and Incorporation of Sustainable Food Production Practices		
Principal Investigator/ Dept Head:	Zhaoming Xu		
Other Applicants:	Patricia Hingston		
Report Submitted By:	Patricia Hingston		
Project Initiation Date:	April 30, 2019	Project Completion Date:	May 30, 2021

2. GOALS, UNANTICIPATED OUTCOMES and NEXT STEPS

2.1 Goals – *With reference to the goals you originally identified in your project proposal, please list the goals of this project that were met, partially met, not met or removed. If not met or removed, please briefly mention the reason(s) for this. Please feel free to use a format other than the table provided.*

	Goal	Met	Partially met	Not met or removed	Reason (if “not met or removed”)
1	Assess the relevancy of program content with respect to industry needs	√			
2	Identify key experiences for graduates	√			
3	Assess program content overlaps, gaps and progression	√			
4	Add missing content areas including sustainability	√			



5	Enhance student depth of knowledge in core areas by scaffolding content across courses		√		Efforts were made to adjust the content in some courses to improve content scaffolding; however, this was a challenging task to address across multiple courses within the two-year time frame of the project. Minor course content changes will continue to be made in the years to come.
6	Ensure instructional and assessment strategies reinforce program learning outcomes (PLOs) and course learning outcomes (CLOs)		√		We were able to successfully review and update our PLOs and CLOs but did not have enough remaining time to review whether assessment strategies reinforced these learning outcomes. Efforts will be made in the coming years to evaluate the alignment of PLOs and CLOs, activities, and assessment methods.
7	Evaluate the growth potential of the program	√			

2.2 Unanticipated Outcomes – *If there were outcomes from the project that were not listed in the proposal, please list them here.*

Website Improvements

The pre-existing Food Science, Double Major and Food, Nutrition and Health Major websites hosted by the Faculty of Land and Food Systems (LFS) had a consistent, appealing structure but lacked sufficient program-specific information, accuracy, and uniqueness. The same was true for the pages for these majors on the you.ubc.ca domain and the newly created Student Services web pages. Maintaining host site consistency, we revamped program descriptors, added curricular details, and improved information accuracy. To distinguish our major from other Food Science degrees, we included details of our program's approval by the largest international governing body for Food Science programs, The Institute of Food Technologists (IFT). We also added details regarding dual degree/double major/minor requirements, curriculum flow charts, program strengths, career examples, industry exposure volunteer opportunities and more.

Minor Improvements

While revising the websites of our various majors, we became more familiar with the minors offered by our program and noted ways in which they could be improved. Required courses for the Food Science and Fermentations Minors were altered to provide students with more foundational knowledge in these disciplines. The Fermentations Minor which is offered at both UBC Vancouver and UBC Okanagan was additionally altered to better equalize the course requirements on the two campuses.



Standardized Syllabi

A custom, standardized Food Science syllabus template was created, based on the UBC-V Senate 2019 syllabus policy. We customized it by adding our governing body's PLOs, an expanded academic integrity section, and recommending a welcome message rather than an instructor biography. Food Science instructors were supported in transitioning their existing syllabi to the new format. Doing so significantly improved the thoroughness of course syllabi, and supported the revision of CLOs. The intention of this initiative was to enhance consistency for students, especially during the pandemic's remote learning. Yet having a more professional set of syllabi to share with the University of Washington for program collaboration, and UBC's Faculties of Science and Applied Science for approval of our courses as electives was secondary benefit.

Standardized Canvas Template

The second year of our curriculum renewal project took place during the transition to remote learning as a result of the Covid-19 pandemic. To assist students in this transition we developed a standardized Canvas home page to be used by all Food Science courses. The homepage template included the time and location of virtual classes and office hours, welcome messages from the instructor and teaching assistants, reminders of upcoming assignments, a full schedule of events for each course with embedded URL links, and student resources for online learning and mental health. This home page was later adopted by several other instructors within LFS and it continues to be used by faculty members following the return to in-person learning.

2.3 Next Steps – *The goal of UPER was to support units in planning to reframe “undergraduate academic program design in terms of learning outcomes and competencies”. Please indicate how you will implement the plans you developed along with any goals to share or extend the work done in your UPER project.*

During our two-year program review, we not only constructed a plan for improving our curriculum, but also made significant progress in implementing a number of the recommended changes.

To date, the following changes have been made to our curriculum:

1. PLOs and CLOs have been revised and aligned
2. Improved course descriptions and prerequisites have been approved by Senate
3. Improved course names to promote consistency within our program have been approved by Senate
4. Changes to the Food Science and Fermentations Minors have been approved by Senate
5. Changes to the scheduling of courses in the Food Science Major and Food and Nutritional Sciences Double Major have been approved by Senate
6. Restricted elective lists were revised for the Food Science Major, Food and Nutritional Sciences Double Major, and the Food, Nutrition and Health Major
7. A new Food Science elective category was created with 3-credits required in our curriculum
8. Where appropriate, content was added or removed from courses to reduce considerable gaps and overlaps, respectively
9. A new course entitled “Food Safety and Quality Management” was developed by an industry professional to address gaps in our curriculum. This course was offered as a pilot elective to students in 2020-21 and 2021-22 and is in the process of being approved as a program requirement for 2022-23. To create space for this course, we removed a course from our core curriculum that did not uniquely cover any of IFT's required PLOs.



10. A new course entitled “Sustainability and the Food Industry” was developed by an industry professional to address gaps in our curriculum. This course was offered as a pilot elective course to students in 2020-21 and 2021-22 and is in the process of being approved as a permanent elective for 2022-23.
11. Enhanced industry exposure and career option awareness have been incorporated into our curriculum through the introduction of a career day, and additional coop placements
12. An in-house Physiology and Anatomy course is currently being developed by one of our faculty members to replace a similar 6-credit course in our curriculum that does not sufficiently meet the needs of our students. If approved by Senate, this new course will be instated in September 2022.

The remaining recommended changes will be implemented as follows:

Recommended change	Plan for implementation
<p>Create a common first year for all majors within the Food, Nutrition and Health Program that includes disciplinary exposure (as opposed to only foundational science and math courses), and has 30 as opposed to 33 course credits. This will help students make a more informed decision of which major they would like to pursue in second year when the requirements for the four degree options begin to differ substantially. Additionally, the reduction in total credits in first year will help reduce student attrition.</p>	<p>There are many benefits to this desired change but it is a very complex change to make as the requirements of all four degrees need to be respected. Several options have been presented to faculty members within the Food, Nutrition and Health Program but a consensus has not yet been reached. Additional meetings designated to this discussion are needed if a consensus is to be achieved.</p>
<p>Make “Sustainability in the Food Industry” a core requirement of the Food Science Major.</p>	<p>This change requires the removal of an existing course from our curriculum. Years three and four of the Food Science curriculum are filled with courses mandated by our governing body, therefore the removal of a course with less of a relationship to Food Science from year two would be the best option for implementing this change. This may be achieved by creating a common first year for all majors within the Food, Nutrition and Health Program, allowing for further distinguishing of the various majors in year two.</p>
<p>Add new “Sustainability in the Food Industry” elective as an option to the Sustainability Minor</p>	<p>Submit Senate approval forms once the course becomes approved as a permanent elective.</p>
<p>Provide more hands-on food product development experience</p>	<p>Add two product development labs to the third year food science laboratory courses (FNH 325 and 326) and allow students the option of choosing a self-driven product development project instead of an industry research project for their fourth year capstone project course. These changes were not possible in 2020-21 due to the pandemic and in 2021-22 the instructor for the</p>



	laboratory courses was on maternity leave. These changes are anticipated to take place in Sept 2022.
Provide more hands-on food processing experience	Add at least one additional food processing lab into the third year food science laboratory courses. This was not possible in 2020-21 due to the pandemic and in 2021-22 the instructor for the laboratory courses was on maternity leave. This change is expected to take place in Sept 2022.
Have select Food Science courses (ex. Food Chemistry, Food Microbiology) be eligible as science electives for students within the Faculties of Science and Applied Science. This would encourage students from other faculties to take our courses, thus helping to expand our program.	The syllabi of courses recommended to be eligible as science credits have been sent to the Faculties of Science and Applied Science for consideration.

The outcomes of this project related to designing food science curricula with graduate industry preparedness in mind, were recently published in the Journal of Food Science Education to provide a foundation upon which other food science curricular renewal projects can build.

2.4 Future Support – *How might the CTLT or other support units help you achieve your next steps? If you are unsure, please consult with the CTLT staff member who worked with you on this project.*

Working internally with instructors to modify their course activities and assessments can be challenging. Suggested changes to course activities and assessment may be more openly accepted if recommended by a third party such as CTLT. Given the complexity of achieving a common first year for students within our program, we may also benefit from having a CTLT staff member mediate this discussion.



3. IMPACT

3.1 Predicting and Confirming the Impact of the Project – *Considering the achievements to date and your expected next steps, please describe:*

- *Who will your UPER project impact? (e.g. students, instructors, TAs or community members) If possible, quantify the size and scope of the impact (e.g. number of students who will be impacted).*
- *How will they be impacted? (e.g. improved graduate outcomes, increased employability, etc.)*
- *What plans do you have for confirming, measuring or evaluating impact?*

Predicted Impacts		
Who (include size/scope)	How	Plan for confirming, measuring or evaluating
<p>Students from the following majors will benefit the most from the outcomes of this curriculum renewal project:</p> <ul style="list-style-type: none"> - Food Science Major (20 students) - Food and Nutritional Sciences Double Major (10 students) - Food, Nutrition and Health Major (150 students) <p>* student numbers reflect annual intake numbers into the majors</p>	<p>Students will benefit from:</p> <ol style="list-style-type: none"> 1. Improved course prerequisites that ensure they have sufficient foundational knowledge to succeed in courses 2. Improved timing of each course based on content succession 3. The creation of more balanced terms by varying content discipline, level of academic challenge and course type within each term 4. Website revisions that assist students in choosing and navigating their degrees 5. Revised restricted elective lists that provide them with options that best compliment their degrees 6. Graduating from a Food Science program that industry professionals helped shape and that was created with industry-desired employee competencies in mind 7. Knowledge of sustainable food production methods that allows them to pursue and be successful in a variety of jobs 8. Obtaining a more complete Food Science education that covers all topic areas outlined by the largest international Food Science approval body: Institute of Food Technologists 	<p>Send out the same survey from our curriculum renewal project annually and assess improvements in student self-evaluation of proficiency in our program’s learning outcomes, and their overall experience in our program.</p>



	<p>(IFT).</p> <ol style="list-style-type: none"> 9. Enhanced industry exposure and hands-on learning experiences 10. Learning from instructors who are aware of how their course fits into the curriculum 	
<p>Industry BC's food industry consists of more than 2,500 food processing companies that employ over 36,000 British Columbians</p>	<p>The local food industry will benefit from hiring students who:</p> <ol style="list-style-type: none"> 1. Graduated from a Food Science program that industry professionals helped shape and that was created with industry-desired employee competencies in mind 2. Are knowledgeable in sustainable food production methods and can help companies accomplish their sustainability goals and/or fulfill new government regulations 3. Are knowledgeable in current and innovative Food Science technologies, food production methods, and laboratory approaches 	<p>Send out the same survey from our curriculum renewal project to members of the local food industry 5 years after the implementation of the new curriculum (Sept 2026) and assess improvements in how industry members evaluate the proficiency of our graduates in our program's learning outcomes as well as other feedback on our graduates.</p>
<p>Instructors UBC's Food Science program currently consists of 16 instructors</p>	<p>Instructors will benefit from:</p> <ol style="list-style-type: none"> 1. Increased awareness of how their course(s) fit into the program's curriculum 2. Updated curriculum maps and program infographics that will help instructors reinforce the learning of key concepts by building off of students' knowledge from prior courses 3. Improved course prerequisites that will ensure students have sufficient foundational knowledge to succeed in their course(s) 	<p>An annual undergraduate Food Science curriculum retreat will be held for instructors to discuss challenges and improvements experienced in their courses.</p>
<p>Program</p>	<p>UBC's Food Science program will benefit from:</p> <ol style="list-style-type: none"> 1. The revised structuring of program and course-level learning outcomes that will be useful for guiding the development of new courses and help familiarize new instructors with our program and how the topics in their 	



	<p>courses fit into the program as a whole</p> <ol style="list-style-type: none"> 2. Fulfilling all of the requirements of our approval body and being in an excellent position to apply for accreditation by the International Union of Food Science and Technology (IUFoST), another internationally recognized Food Science association. 3. The integration of sustainability teachings within our curriculum that will help our program align with the goals of our faculty and support UBC’s Strategic Plan. 4. The involvement of industry partners in our program renewal that will help strengthen our ties and build more meaningful relationships with food industry partners 5. Clarification on the growth potential of the program 	
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3.2 Dissemination – Please provide a list of any past or upcoming activities (e.g. presentations, publications, etc.) through which you or anyone from your team have shared or expect to share information regarding this project.

Publication

Hingston, P. A., & Bracewell, D. D. (2021). Strengthening undergraduate food science programs: Comparing industry relevance of the Institute of Food Technologists' Essential Learning Outcomes with graduate proficiency levels. *Journal of Food Science Education*.

Poster presentations

Bracewell, D., & Hingston, P. (2020). *Curriculum renewal in trying times*. Institute of the Scholarship of Teaching and Learning. UBC.

Hingston, P., & Bracewell, D. (2020). *Comparison of industry needs and UBC food science graduates' preparedness*. Institute of the Scholarship of Teaching and Learning. UBC.

Hingston, P., & Bracewell, D. (2020). *Scaffolding student learning and enhancing industry preparedness*. Institute of Food Technologists International Conference.



4. REFLECTION:

What do you know now that you wish you knew before embarking upon your UPER project? What recommendations would you have for any future programs starting their own program renewal? The information you share will help us design better support resources and guidelines for future applicants.

Reflecting on our curriculum renewal project, we would recommend that any programs embarking on a curriculum renewal engage with instructors as soon and as often as possible. One suggestion is to provide updates on the project at each reoccurring faculty meeting. Where course details are needed we learned that it is best to initiate one-on-one discussions with instructors rather than distribute surveys. This helps ensure that tasks get completed in a timely manner and that the information is as accurate as possible. Conducting timely voting on curriculum decisions can help prevent repetitive discussions and keep the project moving forward. Similarly, to remain transparent throughout the project it is strongly recommended that the outcomes of each vote (and other relevant curriculum renewal documents) be made widely available to instructors in a shared online location.

We also strongly encourage involving student services as early as possible in the project. They harbor a wealth of information regarding program curricula including course scheduling and possible conflicts, requirements of various majors within a program, changes that would complicate transfers, and many other challenges that students face in navigating their degrees. Without sufficient feedback and involvement from student services, some curriculum changes may negatively impact students.

Additionally, we have learned the importance of making and keeping the topic of curriculum front-of-mind for faculty, staff and students. Some ways that this can be done are by better *communicating the curriculum* – through syllabi, program and course learning objectives, accurate and thorough program website content, Canvas shells, and allowing curriculum discussions and dissemination to have equivalent air time to that of research.

With regards to planning for the dissemination of project findings, we advise that data collection methods (ex. surveys, focus groups) be reviewed by CTLT and relevant staff to ensure that they comply with human research ethics. Participants need to be sufficiently notified of and consent to the intended use of the data that is collected from them.

Without designated support such as through an UPER-type grant, curriculum renewal is an infrequent occurrence for many programs due to the time and resources required. Given the pace of change in the world, this puts programs at heightened risk of becoming irrelevant or obsolete, undermining the value of the academic enterprise. We strongly encourage UBC to support curriculum renewal through funded projects, CTLT curriculum consultants, and intra-faculty educational support units.