Food Science Undergraduate Program Renewal

Scaffolding Student Learning and Integration of Sustainability Principles

UBC Land and Food Systems

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PROJECT GOALS

- Assess the **relevancy** of program **content** with respect to industry needs
- Identify **key experiences** for graduates
- Assess program content **overlaps, gaps** and **progression**
- Add **missing content areas**, including sustainability
- Enhance student depth of knowledge in core areas by **scaffolding content** across courses
- Review/revise course and program **learning outcomes**
- Ensure **instructional and assessment strategies** reinforce course and program learning outcomes

PROJECT OUTCOMES

- **Added two new courses** to address missing content areas and industry needs.
  - Food Safety and Quality Management
  - Food Industry Sustainability
- **Revised course prerequisites** and **scheduling** to improve content alignment.
- **Revised restricted electives** list and added new **food science elective category** to promote course options that best compliment a degree in Food Science.
- **Revised requirements** for the Food Science and Fermentations **Minors**.
- Revised and aligned **program** and **course learning outcomes.**
- **Improved course names** and **descriptions.**
- **Standardized course syllabi** and added a list of our governing body's required program learning outcomes with those covered in each course highlighted **(example shown below).**
- **Improved Food Science Major websites** on our faculty and you.ubc.ca domains. The revised websites contain more accurate information, provide more guidance for students, and highlight the uniqueness of our program to prospective students.

Institute of Food Technologists Essential Learning Outcomes (IFT ELOs)

Food Chemistry (FC)

FC.1. Discuss the major chemical reactions that limit shelf life of foods.
FC.2. Explain the chemistry underlying the properties and reactions of various food components.
FC.3. Apply food chemistry principles used to control reactions in foods.
FC.4. Demonstrate laboratory techniques common to basic and applied food chemistry.
FC.5. Demonstrate practical proficiency in a food analysis laboratory.
FC.6. Explain the principles behind analytical techniques associated with food.
FC.7. Evaluate the appropriate analytical technique when presented with a practical problem.
FC.8. Design an appropriate analytical approach to solve a practical problem.

Food Engineering and Processing (FE)

FE.1. Define principles of food engineering (mass and heat transfer, fluid flow, thermodynamics).
FE.2. Formulate mass and energy balances for a given food manufacturing process.
FE.3. Explain the source and variability of raw food materials and their impact on food processing operations.
FE.4. Design processing methods that make safe, high-quality foods.
FE.5. Use unit operations to produce a given food product in a laboratory or pilot plant.
FE.6. Explain the effects of preservation and processing methods on product quality.
FE.7. List properties and uses of various packaging materials and methods.
FE.8. Describe principles and practices of cleaning and sanitation in food processing facilities.

METHODOLOGY

Held **faculty retreat** to clarify program strengths, weaknesses, opportunities, and challenges.

→ Formed **working group** that represented all stakeholders (faculty, students, alumni, industry; 10 members total).

This group helped to create/review stakeholder surveys.

→ **Collected and analysed** core and elective **course content** and syllabi → **developed curriculum maps.**

This was completed by two undergraduate students.

Created a **course comparison** of IFT approved food science **programs.**

Our program is approved by the Institute of Food Technologists (IFT).

→ **Developed and distributed surveys** to industry, alumni, and current students.

→ **Presented** survey and curriculum review **findings to faculty** members along with proposed changes.

Submitted faculty approved **changes to Senate** for review.

PUBLICATION

For a more in-depth summary of our findings, please see our 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*, *20*(4), 130-145.

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