



Master of Science

FOOD SCIENCE AND INNOVATION

The Food Science and Innovation MSc commences with a 15 credit Critical Reading, Writing and Literature Research module, followed by eight 15 credit units, finishing with a 15 credit Methodological Approaches to Research and 30 credit Professional Project.

Core units:

Food
Processing

Food
Composition
and Analysis

Food
Microbiology

Food Safety
and Quality
Management

Fundamental
Nutrition

Future Food
Sustainability

Innovation in
New Product
Development

Molecular
Nutrition and
Biochemistry

Critical Reading, Writing and Literature Research

This unit introduces the skills required to succeed throughout the rest of the course. The primary aim of this unit is to develop critical thinking, reflective writing and other added study skills, including analysis and referencing, to a master's level. This allows the ability to research and investigate strategic opportunities for organisational improvement.

Food Processing

This unit will explore the key principles that govern individual unit operations and how they can be combined to build effective food production chains. Reflecting current and emerging trends within food production, the unit will focus on the principles of food processing and preservation as well as concepts in food engineering. Using model data from demonstrations of food processing equipment and/or from case studies, students will critically evaluate the design and expected performance of proposed processing chains.

Food Composition and Analysis

During this unit students will learn the theory behind food analysis, and understand how a food's chemical composition determines its flavour, texture, nutritional value and safety. Students will explore the influence that chemical profiles have on the characteristics and quality of foods, and how these can be modified by food processing. Students will interpret model data from analysis of food samples taken from across the food chain, to make informed decisions about product quality and safety.

Food Microbiology

This unit focuses on microbiological food hazards and their control, and the importance of microorganisms in food safety and quality. The unit covers: the impact of bacteria and fungi on food quality, safety and food production; food spoilage and the parameters of foods/processing that influence growth and inactivation of microorganisms; foodborne diseases and the main and emerging pathogenic foodborne bacteria, viruses, parasites and fungi; sampling and examination methods to test food for fitness; premises hygiene control and cleaning technology.

Food Safety and Quality Management

This unit focuses on the effective management of risk and product quality throughout the food chain. Students will use case studies to critically assess quality management systems while also evaluating: the implications of microbial, chemical, physical and allergenic contaminants food hazards; provenance, risk reduction and traceability in the food chain; the role of regulation, compliance, market and price mechanisms in delivering quality and more.

Fundamental Nutrition

This unit focuses on nutritional needs throughout the various stages of life. Students will consider the principles of nutrition and discuss food composition, dietary requirements and the acute and chronic consequences of imbalanced nutrient intake. They will build their core knowledge of dietary sources of energy, nutrients and bioactive constituents of food plus nutrient deficiencies and excesses in the human diet. Dietary recommendations and analysis programmes will also be discussed in relation to the improvement of population health, as well as the nutritional adequacy of a variety of diets.

Future Food Sustainability

Adapting to a sustainable food system is one of the most compelling challenges facing society today. Population growth, changing dietary habits, growing health concerns, climate change and other factors continue to put a strain on food availability, and engaging consumers in food policy is an increasingly important part of the change process. This unit will explore the risks, challenges and opportunities for food security, and the innovative technologies and solutions which can help to increase productivity and reduce environmental impact.

Innovation in New Product Development

This unit will develop students' critical understanding of the combination of food science, marketing and strategic management theory required for managing the creation of new food products. New product development (NPD) is vital to the economic success of the food industry thus a strategic focus for successful companies. This unit will examine the key stages in the research, design, development and marketing of new products, and look at industry case studies to help students to understand the managerial and entrepreneurial aspects of an innovative NPD process.

Molecular Nutrition and Biochemistry

Focusing on human digestion, absorption and metabolism, this unit considers the requirements of food formulation and production in meeting dietary needs. This unit will also develop students' ability to present complex scientific knowledge, visually and verbally, to lay and scientific audiences.

Methodological Approaches to Research

This unit will explore critical thinking, reflective writing and other study skills, including analysis and referencing. Distinguishing the key debates in the philosophy, ethics and epistemology of science to justify the relationship between philosophical approaches and choices of qualitative and quantitative methods is examined. Having determined how the research is relevant to the topic, formulating an appropriate methodology and research question to investigate is required.

Professional Project

This unit involves conducting an in-depth research project on a chosen area of study, bringing together and employing all of the skills learned in previous units. Successfully completing this unit will result in clear links drawn between the literature in the field and the development of research objectives and design of a clear conceptual framework. Moreover, the collection, presentation, discussion and appraisal of data is evaluated; and an overall reflection academically and professionally is required.